

Department of Animal and Food Sciences

Self-Study Report

2011-2017

Degree Programs under Review:

Bachelor's Degree in Animal Science
Bachelor's Degree in Food Science
Master's Degree in Animal and Food Sciences
Doctoral Degree in Animal and Food Sciences

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September 7, 2017

Table of Contents

EXECUTIVE SUMMARY

Brief Overview of Animal and Food Sciences	1
Self-Study Process	1
Review Committee Member Names and Affiliations.....	1
Overview of Progress since Last Self-Study	2
Analysis of Strengths and Recommendations for Quality Enhancements.....	4
Accreditations	6

INTRODUCTION AND DEPARTMENT OVERVIEW

Introduction.....	6
Department Mission, Vision, and Goals	7
Department Faculty and Staff	8
Departmental Organization.....	12
Facilities and Equipment.....	13
Departmental Budget	14
Diversity and Inclusion	16

UNDERGRADUATE INSTRUCTION

Animal Sciences Undergraduate Program	16
Overview	16
Animal Sciences Undergraduate Teaching Personnel	16
Animal Sciences Curriculum	18
Unique Aspects of the Animal Science Curriculum	20
Student Enrollment in Animal Sciences	20
Animal Sciences Advising.....	22
Animal Science Retention.....	22
Effectiveness of the Undergraduate Animal Sciences Teaching Program	23
Student Learning Assessment.....	23
Teacher Course Evaluation	24
Student Enrollment	25
Professional Activities to Improve Instructional Efforts	25

Animal Sciences Academic Enrichment Experience.....	25
Animal Sciences Extracurricular Activities (Clubs, Judging Teams)	27
Animal Sciences Student Recognition.....	28
Teaching and Advising Recognition of Faculty and Staff.....	29
Major Limitations/Challenges/Needs	30
Food Science Undergraduate Program	31
Overview.....	31
Food Science Teaching Personnel	32
Food Science Curriculum	33
Unique Aspects of the Food Science Curriculum.....	33
Food Science Enrollment.....	33
Food Science Advising	33
Food Science Retention	34
Assessment of the Undergraduate Food Science Program	34
Food Science Academic Enrichment Experience	34
Food Science Clubs and Advisors	35
Food Science Student Scholarships	35
Notable Food Science Program Accomplishments.....	35
Major Limitations/Challenges/Needs	36
Equine Science and Management Undergraduate Program.....	38
Overview.....	38
Equine Science and Management Teaching Personnel	39
Equine Science and Management Curriculum.....	40
Unique Aspects of the Equine Science and Management Curriculum	41
Comparison to Other Benchmark Programs	41
Hands-On Learning Opportunities.....	42
Facilities	43
Animal Resources	43
Field Trips.....	44
Equine Science and Management Enrollment	44
Equine Science and Management Advising	45
Equine Science and Management Retention and Graduation.....	46
Assessment of the Undergraduate Equine Science and Management Program	47

Professional Activities to Improve Instructional Efforts	48
Equine Science and Management Academic Enrichment Experience	49
Equine Science and Management Clubs and Advisors.....	50
Equine Science and Management Student Awards and Recognition	50
Teaching and Advising Recognition of Faculty and Staff.....	50
Major Limitations/Challenges/Needs	51
Pre-Veterinary Advising Program	52
Overview.....	52
Pre-Veterinary Advising	52
2017 Incoming Students	54
Summary.....	56
 GRADUATE EDUCATION	
Overview.....	57
Admission Requirements	57
Degree Requirements.....	58
M.S. Degree	58
Ph.D. Degree.....	58
Departmental Facilities	59
Graduate Student Enrollment and Support	59
Graduate Students Completed.....	60
Graduate Education Assessment.....	60
Major Limitations/Challenges/Needs	61
 RESEARCH PROGRAM	
Overview.....	62
Research Personnel	63
Research Emphases.....	65
Research by Disciplines	65
Specific Research Units	66
Research Facilities and Equipment.....	67
Laboratory Space in W.P. Garrigus Building	67
Major Research Equipment.....	67
Farm Facilities	67

UK Core Facilities	68
Hatch and Multistate Projects	68
Research Productivity Measures	70
Research Funding.....	70
Research Publications	70
Graduate Student Training.....	70
Research Faculty and Staff Awards and Recognitions.....	71
Notable Research Accomplishments	72
Major Limitations/Challenges/Needs	72
EXTENSION PROGRAM	
Overview.....	73
Extension Personnel.....	74
Beef Cattle Extension Programs and Activities.....	75
Integrated Resource Management (IRM)	75
Master Cattleman Program	75
Applied Master Cattleman Program	75
Master Stocker Program	76
Cattle Handling and Care Certification Program.....	76
Pasture to Plate Program.....	77
Eastern Kentucky Integrated Reproductive Management Program.....	77
Management and Genetics (MAG)-60 Program.....	78
Weaning 101 Workshop	78
Kentucky Heifer Development Program	79
Beef Cattle Genetic Improvement Program.....	79
Kentucky Beef Quality Assurance (BQA) Program.....	80
Certified Preconditioned for Health (CPH-45) Program	80
West Kentucky Select Bred Heifer Sales.....	81
4-H/Youth Beef Cattle Events and Activities.....	81
Dairy Cattle Extension Programs and Activities	81
DAIReXNET (National Dairy Extension Resource).....	81
Silage – Setting the Stage for Top Milk Production	82
Automatic Calf Feeders – Are They for Your Operation?	82

Preventing Loser Dairy Cows.....	82
Calf Nutrition Impacts Future Milk Production.....	82
Dairy Production Shortcourses	83
Dairy Nutrition and Feeding Management Programs.....	83
Western KY Summer Meeting – Adult Program.....	83
Dairy Challenge	83
Collaboration with KY Dairy Development Council and Other Industry Partners	84
KY Dairy Notes Newsletter and Website for Archived Articles.....	84
Kentuckiana Dairy Exchange	84
Compost Bedded-Pack Barns	84
Southeast Quality Milk Initiative.....	85
Freestall Barn Flipping	85
Precision Dairy Farming Applied Research and Outreach.....	85
Kentucky FarmStart	85
Dairy Recruitment.....	85
CowSignals	86
Robotic Milking.....	86
Social Media	86
One-on-One Farm Visits/Personal Consultations.....	86
4-H/Youth Dairy Cattle Events and Activities	86
Equine Extension Programs and Activities.....	88
First Time Horse Owners.....	88
Horse College.....	88
Master Horse Owner 2017	89
Multi-Jurisdictional Animal Resource Coordination Exercise (MARCE 2017) ...	89
Equine Biosecurity Training/Consulting	89
Equine Wellness Clinic.....	89
Saddle Up Safely.....	90
Body Condition Score Workshop.....	90
4-H/Youth Equine Programs and Activities	90

Food Science Extension Programs and Activities	91
Food Safety Regulations for Small Businesses in KY – Extension of Market Ready	91
Helping Food Businesses Sell Canned Food Products According to Federal Regulations	91
Certifying Food Processors in Hazard Analysis and Critical Control Points (HACCP) – A Cost Effective Food Safety System	92
Better Process Control School Certification for Kentucky Processors.....	92
Good Agricultural Practices Third-Party Audit Training	93
FDA’s Food Safety Modernization Act (FSMA) Preventive Controls Qualified Individual Certification.....	93
Produce Best Practices Training (PBPT) Agent In-service Train-the-Trainer Professional Training Program	94
Animals in Disasters and Community Emergency Planning/Training (previously named Strengthening Community Agrosecurity Planning, or S-CAP)	94
Food Systems Innovation Center (FSIC).....	94
University of Kentucky Meat Cutting School (UKMCS).....	95
Farm to Campus.....	95
Hazard Analysis and Critical Control Points (HACCP) Trainings.....	96
Kentucky Association of Meat Processors	96
4-H/Youth Food Science Programs and Activities.....	96
Livestock Forages Extension Programs and Activities (Master Grazer and Grazer 300 Programs).....	97
Kentucky Grazing School.....	97
Advanced Grazing School	97
University Undergraduate Student Kentucky Grazing Schools.....	97
UK Grazing News (Newsletter).....	97
Master Grazer Website	98
Grazing Networks	98
Master Grazers DVD	98
Grazing for Cash.....	98
Regional Field Days – Tweaking your Grazing System.....	98
Grazing Notebook.....	98
Lengthening the Grazing System.....	98
Grazing and Pasture Timely Tips Videos	98

Grazing Demonstrations and Associated Educational Programs.....	99
Poultry Extension Programs and Activities	99
Commercial Poultry Programs.....	99
Small Poultry Flock Programs	99
4-H/Youth Poultry Programs and Activities.....	100
Sheep and Small Ruminant Extension Programs and Activities	101
Small Ruminant Profit School	101
Eweprofit School	101
Sheep Shearing School	101
Lambing School	102
Swine Extension Programs and Activities	102
Personal Consultations.....	102
Pork Quality Assurance Plus (PQA) Program	103
Applied Research	103
4-H/Youth Livestock Programs and Activities.....	103
Extension Publications and Educational Resources	104
Extension Faculty and Staff Awards and Recognitions.....	106
National Level Awards	106
Regional Level Awards.....	106
State Level Awards	106
College Level Awards.....	107
Extension Accountability Measures	107
Major Limitations/Challenges/Needs	107

List of Tables

Table 1. Full-Time Faculty Listing.....	8
Table 2. Aggregate Distribution of Effort for Full-Time Faculty.....	9
Table 3. Adjunct Faculty Listing	9
Table 4. Staff Listing	10
Table 5. Departmental Budget	14
Table 6. Income Generated by Animal and Service Units.....	15
Table 7. Current ASC Teaching Personnel (Faculty and Staff) and Associated Course Information	17
Table 8. Animal Sciences Enrollment Details	21
Table 9. Academic Advisors and Number of Advisees by Semester (ASC Majors)	22
Table 10. Retention and Graduation Rates of Animal Sciences Students at the University of Kentucky (2011-16).....	23
Table 11. Retention and Graduation Rates of Animal Sciences Students in CAFE (2011- 2016).....	23
Table 12. Teacher Course Evaluation (TCE) Response Rate (Resp., %) and Scores by Department and College	24
Table 13. Clubs and Judging Team Advisors	28
Table 14. Animal Sciences Majors (Percent of Enrolled) on Dean’s List.....	28
Table 15. Animal Sciences Majors Receiving Graduation Honors (%)	29
Table 16. Full Time Equivalent (FTE) of Faculty and Staff Teaching ASC Courses	30
Table 17. Food Science Teaching Faculty during 2011-17	32
Table 18. Retired Faculty Members that Taught Food Science Courses during 2011-17	32
Table 19. UK Ag Equine Programs Primary Instructor Full-Time Equivalent.....	39
Table 20. Teaching and Administrative Allocations for AFS Faculty in the EQM Program (2011-17).....	39
Table 21. Description of In-State Equine-Related Education Opportunities at Higher Education Institutions.....	42
Table 22. Total Student Enrollment in the EQM Degree Program (2011-17).....	44
Table 23. AFS Faculty and Staff Advising EQM Students	46
Table 24. Teacher Course Evaluation Scores for EQM Courses.....	48
Table 25. Animal and Food Sciences Research Personnel (2016-17)	64
Table 26. Research Proposals and Grants (Sponsored Projects Awards through UKRF).....	64

Table 27. Research Publications	70
Table 28. AFS Faculty with Extension Appointments	74
Table 29. AFS Extension Associates	74
Table 30. Funding and Number of Participants for Master Cattleman Program	75
Table 31. Funding and Number of Participants for Applied Master Cattleman Program	76
Table 32. Funding and Number of Participants for Master Stocker Program	76
Table 33. Funding and Number of Participants for Cattle Handling and Care Program.....	76
Table 34. Funding and Number of Participants for Pasture to Plate Program.....	77
Table 35. Funding and Number of Participants for Eastern Kentucky Integrated Reproductive Management Program.....	77
Table 36. Funding and Number of Participants for MAG-60 Program	78
Table 37. Summary of Extension Publications and Educational Resources	106

List of Figures

Figure 1. Animal and Food Sciences Organization Chart	13
Figure 2. Animal Sciences Major and Minor Enrollment (Fall 2011 through Fall 2017)	21
Figure 3. Attempted and Earned Credit Hours for Students in EQM Courses	45
Figure 4. 2015 UK Pre-Vet Applicant Pool (2016 Admission).....	55
Figure 5. 2016 UK Pre-Vet Applicant Pool (2017 Admission).....	55
Figure 6. 2017 UK Pre-Vet Applicant Pool (2018 Admission).....	56
Figure 7. Graduate Students Enrolled for Academic Years 2012-16	59
Figure 8. Number of Annual M.S. and Ph.D. Graduates for AFS (2012-16).....	60
Figure 9. AFS Assessment Summary for M.S. Students for 2012-16 (Mean \pm SEM, n=10, 8, 10, 9, 10 for 2012-16)	61
Figure 10. AFS Assessment Summary for Ph.D. Students for 2012-16 (Mean \pm SEM, n=10, 6, 4, 2, 4 for 2012-16)	61

List of Appendices

Appendix A.	Program Review Implementation Plan Progress Reports	109
Appendix B.	IFT Letter of Accreditation for Food Science Undergraduate Degree Program	126
Appendix C.	Two-Page Faculty CVs	131
Appendix D.	Department of Animal and Food Sciences Rules of Procedure	206
Appendix E.	Statement on Evidences of Activity in Instruction, Research and Extension	214
Appendix F.	Criteria and Evidences of Activity for Lecturers	218
Appendix G.	2016-17 Undergraduate Degree Major Sheet for Animal Sciences	221
Appendix H.	2016-17 Undergraduate Minor Sheet for Animal Sciences	224
Appendix I.	Animal Sciences Undergraduate Course Descriptions.....	226
Appendix J.	Example Four-Year Plans of Study for Animal Sciences Animal Industry, Food Industry, and Pre-Professional Options.....	233
Appendix K.	Professional Activities by Individual Faculty and Staff to Improve Instructional Efforts.....	237
Appendix L.	2016-17 Undergraduate Degree Major Sheet for Food Science	242
Appendix M.	Food Science Undergraduate Course Descriptions	245
Appendix N.	Food Science IFT Accreditation Packet.....	248
Appendix O.	Food Science Major and Minor Curriculum Changes (2014-15).....	377
Appendix P.	Food Science Undergraduate Enrollment (2011-17).....	397
Appendix Q.	Food Science Undergraduate Student Retention Rates (2011-15).....	399
Appendix R.	Food Science Academic Enrichment Experience Learning Contracts.....	401
Appendix S.	Original Equine Science and Management Curriculum (2009-13).....	405
Appendix T.	Current Equine Science and Management Curriculum (2014-17).....	408
Appendix U.	Enrollment History in Major Requirement and Emphasis Area Courses in the Equine Science and Management Program that are Taught by Animal and Food Sciences Faculty	411
Appendix V.	Miscellaneous Data for EQM Program and Students	414
Appendix W.	Samples of Direct and Indirect EQM Assessment Tools	424
Appendix X.	Additional Information about Equine Clubs and Teams.....	440
Appendix Y.	Auburn Requirements for Pre-Vet Students (2016-17).....	442
Appendix Z.	Tuskegee Requirements for Pre-Vet Students (2017-18).....	444
Appendix AA.	Confirming Course Equivalencies for The Ohio State University.....	446
Appendix BB.	General Biology Course Equivalency by School	448
Appendix CC.	Graduate Student Handbook	452
Appendix DD.	The Graduate School at UK	468
Appendix EE.	Research Proposals and Grants (Sponsored Projects Awards through UKRF)	472

Appendix FF. Lab Assignments in W.P. Garrigus Building	482
Appendix GG. CAFE Research Lab Space Review	484
Appendix HH. Major Research Equipment in W.P. Garrigus Building.....	491
Appendix II. Research Publications.....	503
Appendix JJ. Extension Publications	539
Appendix KK. Statistical Contacts for AFS Extension Faculty and Staff.....	554
Appendix LL. Impact Statements for AFS Extension Faculty and Staff.....	556

EXECUTIVE SUMMARY

Brief Overview of Animal and Food Sciences

The Department of Animal and Food Sciences (AFS) is one of 14 academic units in the College of Agriculture, Food and Environment (CAFE). The department addresses the major issues faced by animal agriculture and consumers today – production efficiency, sustainability, animal welfare, environmental stewardship, food safety and food quality – through our programs in teaching, research, and outreach. AFS offers two undergraduate degree programs (Animal Sciences and Food Sciences), is heavily involved in instruction for the multidisciplinary Equine Science and Management undergraduate degree program, and provides advising for all undergraduate Pre-Veterinary students. The department offers Doctorate (Ph.D.) and Masters (M.S.) degrees in Animal Sciences in a variety of disciplines related to beef cattle, dairy cattle, horses, poultry, sheep, swine and companion animal species, as well as in the broad area of food science. AFS research faculty are involved in multidisciplinary research programs that advance our knowledge of animal biology and production systems and their relationship to the environment, as well as processing, preservation, and improvement of human foods. The department's extension faculty and staff provides outreach activities that advance sustainable agricultural and food systems and help our youth develop character traits needed to be successful citizens.

Self-Study Process

Dr. Lisa Collins, Assistant Dean for Academic Administration, met with Dr. Richard Coffey, Chair of AFS, to describe the process, discuss potential committee members to serve on the review committee, and provide the check-list to follow for completing the self-study. Dr. Richard Coffey consulted with AFS faculty who suggested potential Review Committee members that were provided to Dr. Collins. The self-study was compiled from various department, college, and university reports. Various faculty members contributed relevant information based on administrative responsibilities (i.e., Directors of Undergraduate Study, Director of Graduate Study, Extension Coordinator, etc.) and as assigned by the Chair. Additional input was solicited from faculty, staff and students where appropriate. All AFS faculty provided copies of their 2-page CVs and were asked to provide feedback on drafts of the report. The final version of the self-study was distributed to faculty on September 7, 2017.

Review Committee Member Names and Affiliations

Dr. Darrell Johnson, Review Committee Chair (Executive Director, UK Regulatory Services)
Dr. David Gerrard (Head, Department of Animal and Poultry Science at Virginia Tech)
Dr. Kris Johnson (Interim Chair, Department of Animal Science at Washington State University)
Dr. Brad Anderson (Professor, Pharmaceutical Sciences in the UK College of Pharmacy)
Mr. Jim Akers (Chief Operating Officer, Bluegrass Stockyards)
Dr. Suman Surendranath (UK AFS faculty member)
Mrs. Amy Lawyer (UK AFS staff member)
Mr. Derek Nolan (UK AFS graduate student)

Overview of Progress since Last Self-Study

The previous program review included the following recommendations that we addressed annually.

Recommendation	Status
<p>1. Enhance and increase regular communication with commodity groups and stakeholders.</p>	<p>The Chair and the department's faculty and staff communicate and interact with commodity groups and stakeholders through service on Advisory Committees and Commodity Organization Boards and by providing field days and other educational and informational sharing events.</p>
<p>2. Develop strategies to expand the delivery of distance learning, on-line courses, and virtual classroom concept.</p>	<p>Due to insufficient faculty numbers and budget resource restrictions, this recommendation was rejected. However, the current Chair has initiated conversations with faculty about the potential for developing an online Masters in Animal Science program.</p>
<p>3. Explore how faculty can be certain to receive performance credit for all major activities.</p>	<p>The Chair continues to work with faculty to ensure their Distributions of Effort (DOE) are accurate and that they clearly document their activities, accomplishments and impacts in their performance review materials. The Chair also continues to work with the department's evaluation committees to ensure each faculty member's important accomplishments are emphasized and reflected in the final evaluation.</p>
<p>4. Explore how faculty and departmental leadership can expand collaborative projects and opportunities with other units.</p>	<p>The department's faculty have made important strides in expanding both research and outreach collaborations. As examples, in FY 2016 the department's faculty were PIs on \$3,038,023 in grants involving collaborations with other departments or other universities, and were co-PIs on \$1,773,998 in grants on which faculty outside the department were the PI. Additionally, extension faculty have numerous collaborations on outreach programs with other departments, universities and commodity organizations/stakeholder</p>

Recommendation	Status
	groups.
5. Develop a plan for a facility and classroom improvement initiative.	IT improvements to several classrooms utilized by the department have been made since the last review. Additionally, CAFE participated in a Provost funded Master Plan study evaluating the long-term facility needs for both the department and college. Several facility improvements at the department's various animal units have also been realized.
6. Work with CAFE administration to simplify business and accounting practices.	The Chair has worked to reorganize the department's Business Office to streamline processes and redistribute necessary tasks. However, university required procedures have increased and accountability measures remain cumbersome and time intensive.
7. Consideration must be taken of the balance between a species and discipline approach for teaching/research. This is critical to the continued success of the department.	Recent faculty searches and hires have been more discipline focused to allow more cross-species interaction and collaboration. For the past several months the department has been reviewing its undergraduate curriculum, specifically evaluating the disciplinary courses that make up the core of our curriculum (e.g. nutrition, physiology, anatomy, etc.). Further, some of our research programs (e.g. precision dairy) integrate several disciplines such as animal behavior, husbandry, engineering, economics, modelling, and nutrition into projects.
8. Study the interactive benefits/costs of targeted program expansion/reduction with consideration of the new university budget model.	With the hiring of a new Provost, the much talked about new budget model was scrapped. As the new Provost makes decisions on how he determines and awards budgets, the department will evaluate how to take advantage of our strengths.
9. Teaching loads must be properly balanced to allow the faculty to address other program priorities.	In 2016, the department received funding from the Provost to hire two (2) faculty Lecturers to help with our ever-growing teaching demands. This significantly helped

Recommendation	Status
	with the FTEs devoted to teaching in both the Animal Sciences and Equine Science and Management undergraduate degree programs. A comprehensive curriculum review for Equine Science and Management is currently underway, and a portion of that review process will look at more appropriately distributing the teaching load amongst AFS and other department faculty and staff.
10. The department should consider how to better support undergraduate students in judging events and club activities.	Due to budget constraints, this recommendation was rejected. However, the Chair, the department’s Extension Associate for Youth Livestock Programs and the Collegiate Livestock Judging Team Coach have been working with the CAFE Office of Philanthropy and Alumni to develop a strategy for establishing endowments and securing operating funding for the various judging programs.

Our Program Review Implementation Plan Progress Reports responding to those recommendations are found in **Appendix A**.

Analysis of Strengths and Recommendations for Quality Enhancements

The development of the self-study documents brought to light several strengths of the department, including:

- A dedicated faculty and staff that are committed to excellence in our mission areas of teaching, research, and extension.
- A dedicated Business Office and support staff that are committed to meeting the needs of the department’s faculty and professional staff.
- A commitment to undergraduate and graduate student success by teaching faculty and staff.
- Sustained extramural funding to support the research and outreach efforts of the department.
- Appropriate balance of discovery and application research.
- Broad and diverse array of extension programs and activities that have a positive impact on clientele.

- Farm resources that support the teaching, research, and outreach missions of the department.

Our introspections also identified several limitations/challenges/needs and areas for quality enhancement. These are outlined in detail in various sections of the self-study document. In brief, these include:

- Budget constraints continue to create challenges in maintaining farm, support unit (Meats Lab, etc.), and infrastructure resources. It has also required faculty to cover an ever-increasing amount of operating and travel with grant and gift funds.
- Current facility housing on-campus personnel (faculty, staff, graduate students, post-doctoral scholars) is outdated, and does not contain sufficient (or adequate) office space to facilitate a maximally productive environment.
- Growth in undergraduate student numbers has necessitated directing additional FTEs towards teaching and away from research and outreach. Over this review period, research and extension FTEs have declined from 15.3 to 12.3 and 12.8 to 11.8, respectively. Maintaining quality and supporting future growth in all three areas of responsibility (teaching, research, and extension) will require additional faculty and staff.
- Growth in undergraduate student numbers has created challenges in identifying adequate classroom and laboratory space. It has also necessitated changes in how laboratories are taught (i.e., fewer hands-on laboratories) due to time and resource limitations.
- Costs associated with providing laboratory supplies and transporting students to farms for laboratories have outpaced the Course Fees allowed by the University. This has placed budget challenges on the department to cover these costs.
- Growth in the multidisciplinary Equine Science and Management undergraduate degree program, which is largely supported by AFS, has placed significant strain on the department in terms of providing instructors, advising students, and Horse Unit resources.
- Strict accounting standards applied to all sources of funding by the University limit flexibility in managing research programs and covering stipends and tuitions for graduate students.
- Current laboratory space and laboratory infrastructure (benches, hoods, storage, etc.) for research is outdated and inadequate. Additionally, much of the research equipment is old and, in some cases outdated, requiring frequent repair. There is a great need for investing in state-of-the-art analytic equipment to enhance research efforts, improve recruiting efforts for students, and to remain competitive in an ever increasingly competitive funding environment. A recent college review of research laboratory space ranked AFS's near the bottom.
- Many of the facilities supporting the Food Science Program (i.e., Meats Lab, Food Processing Pilot Plant) need substantial upgrades and remodeling to better support teaching, research, and outreach needs.

- The Food Science undergraduate degree program offers an opportunity for growth in terms of student numbers.

Accreditations

AFS at the University of Kentucky is home to the only nationally accredited Food Science Program in the state. The most recent accreditation was obtained in December 2014 (**Appendix B**), from the Institute of Food Technologists (IFT; a national organization that reviews all major Food Science Programs in the U.S.).

INTRODUCTION AND DEPARTMENT OVERVIEW

Introduction

The Department of Animal and Food Sciences (AFS) is one of 14 academic units in CAFE. The department addresses the major issues faced by animal agriculture and consumers today – production efficiency, sustainability, animal welfare, environmental stewardship, food safety and food quality – through our programs in teaching, research, and outreach.

The department's instructional programs focus on the application of science and technology to animal and food production. AFS offers two undergraduate degree programs (Animal Sciences and Food Sciences), is heavily involved in instruction for the multidisciplinary Equine Science and Management undergraduate degree program, and provides advising for all undergraduate Pre-Veterinary students. Animal Sciences majors can choose one of three options (Animal Industry, Food Industry, and Pre-Professional), and the Food Sciences degree program meets the requirements for accreditation by the Institute of Food Technologists and the National Organization of Food Science Professionals.

The department's research faculty provides opportunities for students to pursue Doctorate (Ph.D.) and Masters (M.S.) degrees in Animal Sciences. Graduate research work in the broad areas of nutrition, management, animal care and well-being, and reproductive physiology may be conducted with beef cattle, dairy cattle, horses, poultry, sheep, swine and companion animal species. Students with interests in foods may specialize in meats, dairy products, food microbiology, muscle biology, or food chemistry. In addition to research projects that are a part of graduate training, the AFS faculty are involved in multidisciplinary research programs that advance our knowledge of animal biology and production systems and their relationship to the environment, as well as processing, preservation, and improvement of human foods.

The department's faculty and staff provides outreach activities that positively influence the economic sustainability and the quality of life for Kentuckians. Educational opportunities, learning resources, and consultations are provided by Extension Specialists, Extension Associates, and other personnel in the areas of beef cattle, dairy cattle, horses, poultry, sheep, swine, meats, and food science. Our extension programs advance sustainable agricultural and

food systems and assist our youth to develop character traits needed to be successful citizens.

The department maintains several animal and service units that support our land-grant missions of teaching, research, and outreach. These facilities include lab and animal space in W.P. Garrigus Building, beef cattle, sheep, and swine facilities at C. Oran Little Research Center, dairy cattle and poultry facilities at Coldstream Farm, equine facilities at Maine Chance Farm, and beef cattle facilities at the Research and Education Center in Princeton, KY. Additionally, the department maintains an abattoir and meats laboratory, as well as a Butcher Shop for marketing meats products.

Department Mission, Vision, and Goals

The mission of AFS is to (1) develop, improve, and promote sustainable animal production systems (2) improve the health and well-being of animals in food and non-food production systems, (3) enhance the quality, utilization and safety of food products, and (4) facilitate life-long learning through creative research and discovery, challenging and encompassing education, and effective engagement and technology transfer. This mission is grounded in the University's and College's Land Grant responsibilities of enhancing our clientele's quality of life through excellence in research, education, and outreach.

The department contributes directly to achieving the goals of the statewide postsecondary education strategic agenda, specifically:

- Kentucky will be stronger by ensuring that many more individuals complete a postsecondary degree or credential, and that they graduate with the skills and abilities to be productive, engaged citizens.
- Promote academic excellence through improvements in teaching and learning.
- Kentucky will be stronger by training a globally competitive, entrepreneurial workforce; educating an engaged, informed citizenry; improving the health and well-being of families; and producing new research and discoveries that fuel job creation and economic growth.
- Increase basic, applied, and translational research to create new knowledge, accelerate innovation, and promote economic growth.

AFS expends considerable resources to support its research mission; our department-wide faculty Distribution of Effort (DOE) in 2016-17, measured as full-time equivalents (FTE), was 12.3 (38.4% of the total FTEs devoted to teaching, research and extension). Our large, diverse department conducts research in a variety of areas. The breadth of research topics and collaborative efforts between basic and applied researchers allows for a unique research perspective, contributing to all aspects of the Stronger by Degrees research goals. Likewise, we are a very service/extension focused department; our department-wide faculty DOE, measured as full-time equivalents (FTE), was 11.8 (36.9% of the total FTEs devoted to teaching, research and extension). This provides a great platform to extend our research knowledge into the community, providing adult education via our Extension Specialists (as well as our Extension Associates and other faculty and staff), contributing to the economic growth of Kentucky's agriculture sector, and engaging with our citizenry. Our extension personnel also supports K-12

education programs through judging activities (livestock, dairy, poultry, and meats), skillathon activities (livestock, dairy, and equine), and workshops attended by Vocational Agriculture Teachers. The department is a major contributor to multiple undergraduate programs in CAFE including Animal Sciences, Food Science, and Equine Science and Management. AFS also has a major focus on our Animal Science graduate degree program. Our department-wide faculty DOE, measured as full-time equivalents (FTE), was 7.9 (24.7% of the total FTEs devoted to teaching, research and extension). The department promotes improvement in teaching with our formative peer-review of teaching activity.

Department Faculty and Staff

The number of full-time faculty in the department currently sits at 37 (**Table 1**), and is comprised of two Lecturers, one Senior Lecturer, five Assistant Professors, 11 Associate Professors, and 18 Professors. Thirteen full-time faculty are women. All of the full-time faculty are located on main campus in the W.P. Garrigus Building, except for two faculty (Elizabeth James and Camie Heleski) located in Ag Science North and one faculty (Roy Burris) whose work location is the UK Research and Education Center in Princeton, KY. Two-page CVs for faculty can be found in **Appendix C**.

Name	Rank	Specialty
Aaron, Debra	Professor	Statistics, Beef and Sheep Production
Adedokun, Sunday	Assistant Professor	Swine and Poultry Nutritionist
Amaral-Phillips, Donna	Extension Professor	Extension Dairy Nutritionist
Anderson, Leslie	Extension Professor	Beef Extension Specialist
Bewley, Jeffrey	Associate Extension Professor	Extension Dairy Systems
Boatright, William	Professor	Food Chemistry
Bridges, Phillip	Associate Professor	Reproductive Biology
Bullock, Kevin	Extension Professor	Beef Breeding and Genetics
Burris, Walter (Roy)	Extension Professor (Post Retirement)	Beef Cattle
Camargo, Fernanda	Associate Extension Professor	Equine Extension
Coffey, Richard	Chair, Extension Professor	Extension Swine Specialist
Coleman, Robert	Associate Extension Professor	Extension Horse Specialist
Costa, Joao	Assistant Professor	Dairy Behavior and Management
Dwyer, Roberta	Professor	Veterinary Medicine
Ely, Donald	Professor	Ruminant Nutrition
Harmon, David	Professor	Nutritional Physiology
Heersche Jr., George	Extension Professor	Extension Dairy Specialist
Heleski, Camie	Senior Lecturer	Equine Behavior and Management
Hennig, Bernhard	Professor	Nutrition and Toxicology
Holder, Mieke	Assistant Research Professor	Grazing Nutrition/Nutrient Management
James, Elizabeth	Lecturer	Equine Science

Table 1. Faculty Listing		
Name	Rank	Specialty
<i>(continued from previous page)</i>		
Lawrence, Laurie	Professor	Equine Nutrition
Lehmkuhler, Jeffrey	Associate Extension Professor	Extension Beef Cattle Specialist
Lindemann, Merlin	Professor	Swine Nutritionist
Matthews, James	Professor	Nutritional Physiology
McLeod, Kyle	Associate Professor	Beef Cattle Nutrition
Newman, Melissa	Associate Professor	Food Microbiology/Safety
Pescatore, Anthony	Associate Chair, Extension Professor	Poultry Extension
Rentfrow, Gregg	Associate Extension Professor	Meat Science Extension
Rossano, Mary	Associate Professor	Equine Epidemiology/Parasitology
Schendel, Rachel	Assistant Professor	Food Chemistry
Suman, Surendranath	Professor	Muscle Foods
Urschel, Kristine	Associate Professor	Equine Science
Vanzant, Eric	Associate Professor	Beef Cattle Nutrition
Vijayakumar, Paul	Assistant Extension Professor	Extension Food Science
Wahrmund, Jackie	Lecturer	Animal Science and Management
Xiong, Youling	Professor	Protein Chemistry

Table 2 shows the aggregate DOE across the three Land-Grant mission areas for the review period, measured in FTEs. As a point of reference, a typical three-hour course with fewer than 40 students would be considered 10% of a FTE.

Table 2. Aggregate Distribution of Effort for Full-Time Faculty						
	Academic Year					
	11/12	12/13	13/14	14/15	15/16	16/17
Teaching FTE	7.9	8.1	7.7	7.7	8.6	7.9
Research FTE	15.3	13.4	13.7	13.6	14.1	12.3
Extension FTE	12.8	11.5	11.6	11.7	12.3	11.8

The department currently has 14 Adjunct faculty (**Table 3**). Historically, Adjunct faculty members have been appointed to provide special knowledge or skills for graduate student committees.

Table 3. Adjunct Faculty Listing		
Name	Rank	Home Institution/Company
Aiken, Glen	Adjunct Assistant Professor	USDA-ARS
Andries, Kenneth	Adjunct Assistant Professor	Kentucky State University
Ao, Tuoying	Adjunct Assistant Professor	Alltech, Inc.
Brennan, Kristen	Adjunct Assistant Professor	Alltech, Inc.
Cortese, Victor	Adjunct Assistant Professor	Zoetis Animal Health

Table 3. Adjunct Faculty Listing		
Name	Rank	Home Institution/Company
<i>(continued from previous page)</i>		
Dawson, Karl	Adjunct Professor	Alltech, Inc.
Flythe, Michael	Adjunct Assistant Professor	USDA-ARS
Klotz, James	Adjunct Assistant Professor	USDA-ARS
Pierce, James	Adjunct Assistant Professor	Alltech, Inc.
Strobel, Herbert	Adjunct Associate Professor	Hallockville Museum Farm
Tidwell, James	Adjunct Assistant Professor	Kentucky State University
Tricarico, Juan	Adjunct Assistant Professor	Innovation Center for U.S. Dairy
Wang, Changzheng	Adjunct Assistant Professor	Kentucky State University
Yiannikouris, Alexandros	Adjunct Assistant Professor	Alltech, Inc.

The department currently has 60 professional and support staff employees (**Table 4**). Thirty-seven staff are housed in the W.P. Garrigus Building, two are housed at the UK Research and Education Center in Princeton, KY, and 21 are housed at one of the seven off-campus animal units or feed mill. Staff responsibilities include four Business Office staff, two Staff Support Associates, three Academic Coordinators, three IT Support Specialists, 18 Lab Technicians or Research Analysts, five Extension Associates, one Extension Project Manager, two Program Coordinators, nine Animal Unit/Meats Lab/Feed Mill Managers, five Assistant Animal Unit Managers, and eight Farm Technicians.

Table 4. Staff Listing		
Name	Title	Faculty Supervisor
Akers, Katherine	Research Analyst	Melissa Newman
Austin, Steven	Ag Extension Associate	Richard Coffey
Barnett, Velvet	Computer Support Spec II	Kevin Bullock
Berry, Frank	Animal Care Coordinator	Donald Ely
Billingsley, Brock	Research Facility Manager	Gregg Rentfrow
Bohannon, Adam	Lab Tech Sr.	Kyle McLeod
Cassill, Bryan	Animal Resources Manager	Laurie Lawrence
Clark, Joey	Research Facility Manager	Jeffrey Bewley
Clark, Lauren	Research Farm Tech III	David Harmon
Collins, James	Animal Care Coordinator	Jeffrey Bewley
Core, L. Brittany	Animal Care Coordinator	Jeffrey Bewley
Crum, Andrea	Lab Tech Sr.	Luke Boatright / Laurie Lawrence
Decker, Cortney	Administrative Assistant	Anthony Pescatore
Elliott, Robert	Research Farm Tech II	Merlin Lindemann
Fendley, Amelia	Lab Tech Sr.	Jeffrey Bewley
Fink, Endre	Ag Research Specialist	Donald Ely
Ford, Mike	Ag Research Specialist	Anthony Pescatore
Fox, Kristin	Ag Research Specialist	Laurie Lawrence

Table 4. Staff Listing

Name	Title	Faculty Supervisor
<i>(continued from previous page)</i>		
French, Chris	Research Farm Tech II	Jeffrey Bewley
Gillespie, David	Lab Tech Sr.	Anthony Pescatore
Goodwin, Robert	Research Farm Tech I	Roy Burris
Graham, Vern	Research Farm Tech II	Merlin Lindemann
Hagan, Kevin	Admin Support Associate I	Anthony Pescatore
Hamilton, Charles	Research Analyst	Phillip Bridges
Haminton, Matthew	Research Farm Tech III	David Harmon
Hannan, Ashley	Lab Tech Sr.	Kristine Urschel
Hayes, Susan	Research Analyst	Laurie Lawrence
Heard, Lori	Staff Support Assoc. I	Richard Coffey
Higginbotham, David	Ag Services Manager	Merlin Lindemann
Hollin, Sheila	Admin Staff Officer I	Richard Coffey
Inocencio, Noel	Research Analyst	Merlin Lindemann
Jacob, Jacqueline	Ag Extension Project Mgr	Anthony Pescatore
Jang, Young Dal	Research Associate	Merlin Lindemann
Knight, K. Blair	Ag Research Specialist	Roy Burris
Lamb, Kelsey	Lab Tech Sr.	Melissa Newman
Laurent, Kevin	Ag Extension Assoc Sr.	Walter Burris
Lawyer, Amy	Ag Extension Assoc Sr.	Fernanda Camargo
Leed, Ann	Academic Coordinator	Debra Aaron
Li, Shuting	Lab Tech Sr.	Surendranath Suman
Lin, Winston	Research Analyst PR	David Harmon
McGill, Nancy	Ag Extension Associate	Donna Amaral-Phillips
Monegue, Jim	Ag Research Specialist	Merlin Lindemann
Moore, Jennifer	Program Coordinator I	Bernhard Hennig
Notton, Robin	Staff Support Assoc. I	Richard Coffey
Parrish, Billy	Research Farm Tech II	Roy Burris
Richardson, Ryan	IS Tech Support Assistant	Bernhard Hennig
Roberts, Cynthia	Lab Tech Sr.	Eric Vanzant
Slaughter, Leeann	Academic Coordinator	Gregg Rentfrow
Son, Kwangwon	Research Analyst	James Matthews
Sparrow, Kip	Animal Care Coordinator	Merlin Lindemann
Stidham, Cindy	Admin Services Asst Sr	Richard Coffey
Tackett, Paden	Research Farm Tech III	Jeffrey Bewley
Tebeau, Colette	Academic Coordinator	Roberta Dwyer
True, Dani	Ag Research Specialist	Youling Xiong

Table 4. Staff Listing		
Name	Title	Faculty Supervisor
<i>(continued from previous page)</i>		
Tseng, Yen Chang	Lab Tech Sr.	Rachel Schendel
Tucker, Larissa	Ag Extension Assoc Sr.	George Heersche
Vanzant, Kirk	Ag Research Specialist	David Harmon
Veach, Kevin	Computer Support Spec II	Eric Vanzant
Wise, Derrick	Animal Care Coordinator	David Harmon
Zehnder, Matthew	Research Farm Tech II	Laurie Lawrence

Departmental Organization

The department is organized and governed by the Department of Animal and Food Sciences Rules of Procedure (**Appendix D**), which is designed to be consistent with the Governing Regulations and the Administrative Regulations of the University of Kentucky (UK), the Rules of the University Senate, the Rules of Procedure of the CAFE, and the laws of the Commonwealth of Kentucky and of the United States of America.

In brief, the department organization includes the faculty, Chair, Associate Chair, Directors of Undergraduate Studies (one each Animal Sciences, Food Sciences, and Pre-Veterinary Medicine), Director of Graduate Studies, Extension Program Coordinator, Youth Development Coordinator, Academic Coordinators, and several appointed or elected committees to assist with department activities. Committees appointed by the Chair include Animal Science Curriculum Committee, Food Science Curriculum Committee, Graduate Activities Committee, Promotion and Tenure Committee, Undergraduate Scholarship Committee, Laboratory Safety Committee, Farm Safety/Animal Health Care Committee, Social Committee, Recognition and Awards Committee, Animal and Food Sciences Reunion Committee, and Animal and Food Sciences Hall of Fame Committee. Members of appointed committees serve staggered 3-year terms, with approximately one-third of the members being replaced each year. Elected Committees include the Advisory Council and the Faculty Animal Service/Support Unit Coordinators. The faculty elects the Advisory Council for 2-year terms, with approximately one-half of the council being elected each year. Faculty in the various commodity or unit groups elect the Faculty Animal Service/Support Unit Coordinators as needed. Both elected committees are consulted as needed by the Chair.

The Directors of Undergraduate Studies, Director of Graduate Studies, and Extension Program Coordinator coordinate almost all tasks relating to their programs, and with their committees, develop policy as motions brought to the faculty. Faculty meetings occur monthly during the Fall and Spring semesters of the academic year.

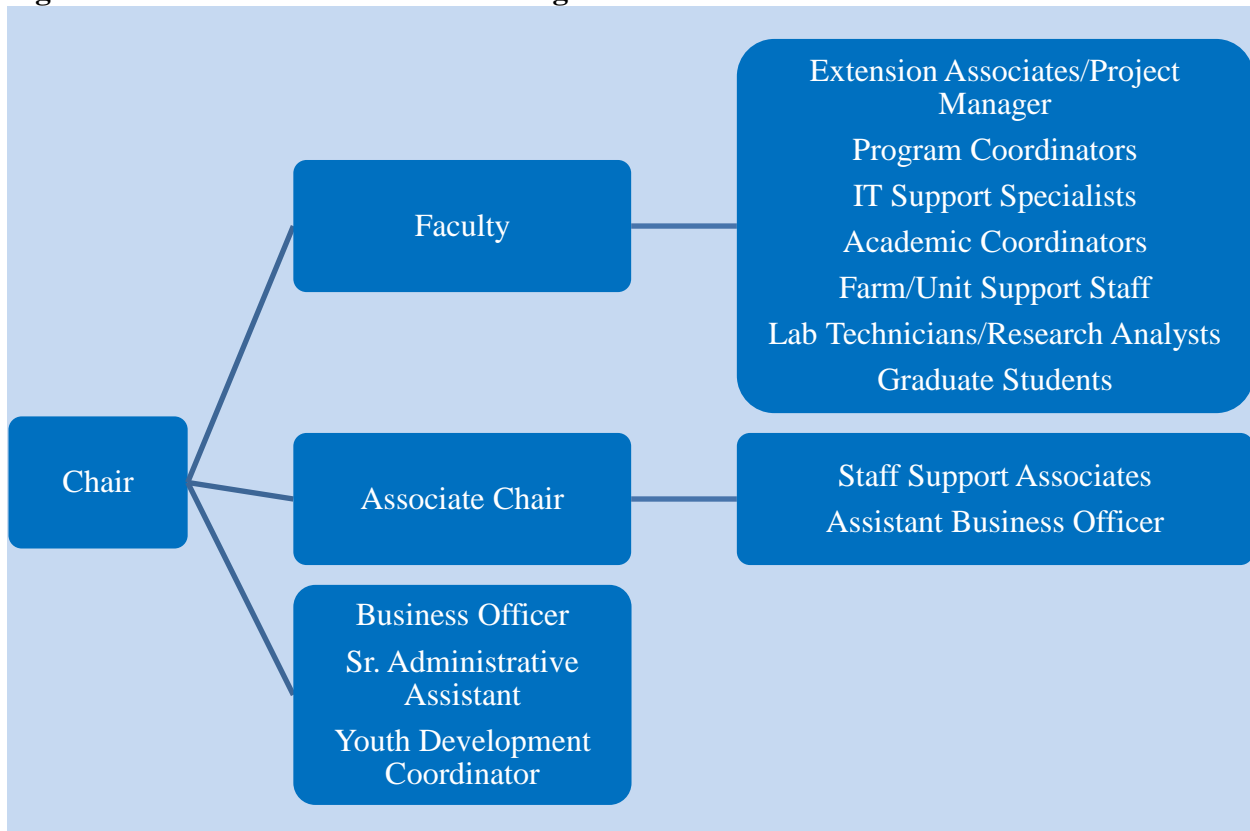
CAFE provides substantial support in terms of procedural guidance, business management, student services, legal guidance, pre-award grant proposal assistance, and overall leadership. Other service units in CAFE and the University, particularly Human Resources, Office of Sponsored Projects Administration, and Accounts Payable, focus more on procedural compliance than assistance. Frequently changing procedures and systems do not allow staff to acquire the

efficiencies borne of experience. The complexity of administrative compliance and reporting has grown significantly over the past several years, requiring more time and effort on the part of departmental Business Office personnel and demanding higher skill levels of staff, but with few visible benefits to the units that deliver teaching, extension, and research. In the past, the department had little interaction with CAFE development and alumni affairs unit, with most interaction consisting of email notifications of donations received. Recent hires by CAFE in the Office of Philanthropy and Alumni has increased philanthropic opportunities for the department substantially.

Faculty personnel actions such as appointments, performance evaluations, and promotions are heavily regulated by University procedures, with multiple checkpoints to ensure adherence to policies. Guidelines for all procedural aspects of departmental administration are available online, ranging from the University’s administrative and governing regulations, to College-level instructions, to the department’s Rules of Procedure (**Appendix D**), Statement on Evidences of Activity in Instruction, Research and Extension (**Appendix E**) and Criteria and Evidences of Activity for Lecturers (**Appendix F**).

An organizational chart (**Figure 1**) for the department appears below.

Figure 1. Animal and Food Sciences Organization Chart.



Facilities and Equipment

The department occupies a portion of the basement and floor 1, and the entirety of floors 2, 4, 6,

8, and 9 of the W.P. Garrigus Building (which includes offices, five small conference rooms, a copier room, storage space, laboratories, animal laboratory, and the Meats Lab/Butcher Shop), and two offices on the second floor of Agricultural Sciences-North in the Equine Programs office suite on the Lexington campus. Office space is very tight and we struggle to provide space for graduate students, post-doctoral scholars, and visiting scientists, with all of these groups forced to share office space. Climate control is chronically inadequate in many of our office and laboratory spaces.

The department also occupies 3-4 office spaces at the UK Research and Education Center in Princeton, and maintains animal/service units at the UK Research and Education Center in Princeton (beef), C. Oran Little Animal Research Center in Versailles (beef, sheep, swine, and feed mill), Coldstream Farm in Lexington (dairy and poultry), and Maine Chance Farm in Lexington (equine). An ongoing challenge for the department is maintenance and update of animal/service unit facilities.

Equipment consists of personal computers, laptops, tablets, printers, copiers, projectors, poster printer, IT support equipment, a variety of laboratory equipment, and equipment associated with livestock and feed production. Keeping equipment up-to-date is an ongoing challenge, particular that associated with livestock production. A modern feed mill opened in 2015 and adequately supports feed production for the department’s animal units.

Departmental Budget

The department is funded through CAFE budget funds (summarized in **Table 5**), revenue from income generated by animal and service units (**Table 6**), external grant funds, and unrestricted gifts. The main sources of internal funding are the state and federal (US Department of Agriculture) funds that flow through the Agricultural Experiment Station for research, resident instruction funds (teaching), and extension funds (off-campus educational programs). Total federal and state funds allocated to the department in fiscal year 2017 were \$7.15 million. For historical comparison purposes, this total was \$5.62 million in FY 2006.

Fiscal Year	Teaching	Research	Extension	Total (\$)	Percent
2011-12					
State	\$1,142,895	\$2,252,996	\$1,238,352	\$4,634,243	74%
Federal	----	\$1,249,029	\$407,415	\$1,656,444	26%
Total (\$)	\$1,142,895	\$3,502,026	\$1,645,767	\$6,290,687	
Percent	18%	56%	26%		
2012-13					
State	\$1,131,676	\$2,049,274	\$1,214,816	\$4,395,766	75%
Federal	----	\$1,150,463	\$350,961	\$1,501,423	25%
Total (\$)	\$1,131,676	\$3,199,737	\$1,565,776	\$5,897,189	
Percent	19%	54%	27%		

Table 5. Departmental Budget

Fiscal Year	Teaching	Research	Extension	Total (\$)	Percent
<i>(continued from previous page)</i>					
2013-14					
State	\$1,148,928	\$2,168,173	\$1,239,251	\$4,556,352	72%
Federal	----	\$1,488,469	\$282,284	\$1,770,753	28%
Total (\$)	\$1,148,928	\$3,656,642	\$1,521,535	\$6,327,105	
Percent	18%	58%	24%		
2014-15					
State	\$1,252,963	\$1,252,963	\$1,368,057	\$4,932,986	65%
Federal	----	\$2,379,599	\$289,677	\$2,669,277	35%
Total (\$)	\$1,252,963	\$4,691,566	\$1,657,734	\$7,602,262	
Percent	16%	62%	22%		
2015-16					
State	\$1,318,371	\$1,318,371	\$1,354,116	\$5,042,633	70%
Federal	----	\$1,854,234	\$304,186	\$2,158,420	30%
Total (\$)	\$1,318,371	\$4,224,380	\$1,658,301	\$7,201,053	
Percent	18%	59%	23%		
2016-17					
State	\$1,378,956	\$1,378,956	\$1,428,747	\$5,215,128	73%
Federal	----	\$1,581,468	\$358,202	\$1,939,670	27%
Total (\$)	\$1,378,956	\$3,988,894	\$1,786,948	\$7,154,798	
Percent	19%	56%	25%		

Table 6. Income Generated by Animal and Service Units

	Fiscal Year					
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Income ^a	\$1,710,120	\$1,231,874	\$1,553,236	\$1,843,993	\$1,321,919	\$1,301,871

^aTotal income less any fees associated with the sale of livestock or products (e.g., commission, insurance, checkoff or promotion, etc.).

Total funding from state and federal sources increased the first few years of this review period, but declined from FY 14-15 to FY 16-17. Income generated from the department's animal and service units have varied due to fluctuations in market animal and product prices received. Aside from state and federal funding, the department receives fluctuating amounts of extramural funding (the most recent KAES Annual Report lists grants of \$3.7 million in 2016), and as of this writing the department is carrying \$1,035,788 in restricted accounts.

Diversity and Inclusion

UK is committed to diversity as a vital characteristic of an optimal education and workplace. The University maintains a firm conviction that it must strengthen the diversity of its communities, support free expression, reasoned discourse and diversity of ideas; and take into account a wide range of considerations, including but not limited to, ethnicity, race, disability, and sex, when making personnel and policy decisions.

AFS recognizes, and is committed to, the importance of diversity in its personnel. In accordance with UK guidelines, all faculty and staff searches make an effort to reach individuals from underrepresented groups. Currently, AFS has 13 female faculty members and seven international faculty members, further contributing to the diversity and breadth of the program. Of AFS's full-time staff, 45% are women.

UNDERGRADUATE INSTRUCTION

Faculty and staff in AFS provide the primary instruction and academic advising to students in three undergraduate degree programs: Animal Sciences (ASC), Food Science (FSC), and Equine Science and Management (EQM). Each of these undergraduate degree programs are described in detail in separate sections that follow. After reading all three sections, it will be apparent there is significant overlap between ASC and EQM, which is administered by Equine Programs. Additionally, AFS is home to Pre-Veterinary advising, and is described in a section below.

Animal Sciences Undergraduate Program

Overview

Undergraduate courses with ASC prefixes primarily serve ASC and EQM majors. However, we also serve a significant number of students from other majors. These include Agricultural Economics, Career and Technical Education, Community and Leadership Development, Plant and Soil Sciences, and Sustainable Agriculture. Often, students in these majors go so far as to pursue a minor in ASC. In particular, the Plant and Soil Sciences major has a Crops and Livestock option, which has a built-in ASC minor.

Animal Sciences Undergraduate Teaching Personnel

Currently, 21 faculty and staff are responsible for teaching 25 undergraduate ASC courses. These individuals, courses taught, and the most recent course enrollment data are listed in **Table 7**. Formal class sizes (not including ASC 333 or ASC 499) range from 15 to 179. One section of GEN 100 Issues in Agriculture, Food and Environment is taught by a member of the AFS and is listed in **Table 7**. In addition, five other faculty and staff have responsibility for EQM undergraduate courses; these are identified in the section of this report related to EQM Undergraduate Program. Faculty teaching graduate-level ASC courses are identified in the section of this report related to the ASC Graduate Degree Program.

Table 7. Current ASC Teaching Personnel (Faculty and Staff) and Associated Course Information

Instructor	Course	Enrollment Spring 2017	Enrollment Fall 2017 ^a
Aaron, Debra K.	ASC 102 Intro to Livestock & Poultry Production	52	
	ASC 362 Animal Breeding & Genetics	64	30
	ASC 499 Academic Enrichment Experience	50	34
Adedokun, Tayo	ASC 340 Poultry Production	48	
	ASC 378 Animal Nutrition		92
Amaral-Phillips, Donna	ASC 333 Dairy Management & Diagnostics I		1
	ASC 333 Dairy Management & Diagnostics II	1	
Anderson, Leslie	ASC 406 Beef Cattle Science		15
Bewley, Jeffrey	ASC 333 Dairy Cattle Diseases & Health	10	
	ASC 333 Dairy Scientific Journal Review	10	5
	ASC 333 Dairy Systems Research		2
	ASC 333 Advanced Dairy Biology and Management		2
	ASC 420G Dairy Cattle Management		41
Bridges, Phillip	ASC 364 Reproductive Physiology of Farm Animals	75	28
Bullock, Darrh	ASC 406 Beef Cattle Science		15
Dwyer, Roberta	ASC 209 Veterinary Medical Terminology	35	
Ely, Donald	ASC 102 Intro to Livestock & Poultry Production	54	
	ASC 404G Sheep Science		36
Harmon, David	ASC 388 Companion Animal Nutrition	6	
Heleski, Camie	ASC 310 Equine Anatomy		47
	ASC 333 Animal Behavior		17
	ASC 333 Animal Welfare Assessment		5
Lawrence, Laurie	ASC 311 Advanced Equine Evaluation		17
	ASC 389 Applied Equine Nutrition & Feeding	26	
	ASC 410G Equine Science	25	
Lawyer, Amy	ASC 310 Equine Anatomy	56	
Leed, Ann	GEN 100 Issues in Ag, Food & Environment		24
	ASC 408G Swine Production	60	
Lehmkuhler, Jeffrey	ASC 406 Beef Cattle Science		15
Newman, Melissa	ASC 209 Veterinary Medical Terminology	35	
Pescatore, Tony	ASC 340 Poultry Production	48	
	ASC 470 Capstone in Animal Sciences	29	
Rentfrow, Gregg	ASC 300 Meat Science		41
Rossano, Mary	ASC 320 Equine Management		132
Tebeau, Colette	ASC 209 Veterinary Medical Terminology	52	53
Urschel, Kristine	ASC 325 Animal Physiology	36	72

Table 7. Current ASC Teaching Personnel (Faculty and Staff) and Associated Course Information

Instructor	Course	Enrollment Spring 2017	Enrollment Fall 2017 ^a
<i>(continued from previous page)</i>			
Wahrmund, Jackie	ASC 101 Domestic Animal Biology	99	179
	ASC 205 Career Development in Animal Sciences	43	45
	ASC 333 Scholar of Teaching & Learning in ASC	10	17
	ASC 382 Animal Production Principles	29	

^a Fall 2017 projected numbers.

Note: ASC 301 Livestock Selection and Evaluation, ASC 303 Evaluation and Grading of Meats, ASC 309 Advanced Evaluation and Grading of Meat, ASC 312 Advanced Livestock Selection and Evaluation, ASC 321 Dairy Cattle Evaluation, and ASC 323 Advanced Dairy Cattle Evaluation are all taught by Graduate Assistants under the supervision of a faculty member.

Animal Sciences Curriculum

Departmental faculty administers the undergraduate ASC program. The ASC Undergraduate Curriculum Committee (ASC-UCC) is responsible for curriculum development, changes and revisions to the curriculum, assessment of learning outcomes, and other aspects of managing the undergraduate Animal Sciences program. The Director of Undergraduate Studies (DUS) for ASC, Dr. Debra Aaron, chairs the ASC-UCC. She reports to the Department Chair. The Academic Coordinator, Ann Leed, sits on the committee, along with four to five faculty members appointed by the Department Chair. The entire faculty votes upon all curriculum decisions.

Since the last departmental review, minor changes have been made to the ASC curriculum, course prerequisites have been tightened, and an overall cleanup of the curriculum has been conducted. Due to the continual increase of student numbers and student demand for Animal Sciences courses, several ASC courses have gone from being offered only once an academic year, to now being offered in both fall and spring semesters (e.g. ASC 101, ASC 325, ASC 362, and ASC 364).

ASC undergraduate degree requirements and course offerings are comparable to other land grant institutions offering a similar major. Students take a wide variety of coursework, including general education (natural inquiry, communication, quantitative reasoning, and citizenship), pre-major requirements (math, chemistry, biology, and writing), introductory animal sciences, and finally, discipline (animal breeding and genetics, physiology, nutrition, reproduction) and animal production (beef, dairy, poultry, swine, sheep, equine, companion animal, meats) courses. Specific Animal Sciences degree (major) requirements are described in **Appendix G**, Animal Sciences minor requirements are listed in **Appendix H**, ASC undergraduate course offerings are described in **Appendix I**, and example four-year plans of study are provided in **Appendix J**.

To earn the Bachelor of Science (B.S.) degree in ASC, a student must earn a minimum of 120 credit hours and have at least a 2.0 grade-point standing. All students at the UK are required to complete a diverse, general education curriculum that is referred to as the UK Core. Of the 120 credit hours required for a B.S. in Animal Sciences, 33 are UK Core. Nine of the UK Core hours

(three courses) also satisfy pre-major requirements (Calculus, General College Chemistry I, and General College Chemistry I Lab). In addition, students must complete college, major, and specialty support requirements (**Appendix G**). A minimum of 45 credit hours must be from upper division courses (300 level and above).

Animal Sciences majors have the opportunity to pursue specific interests by selecting one of three study options:

Pre-Professional (See **Appendix J** for example plan of study.)

Students receive training in basic sciences relevant to animal biology including chemistry, physics, mathematics, genetics, and microbiology. This option prepares students for advanced studies in animal sciences, veterinary or human medicine, and for employment opportunities in the pharmaceutical or research industries. It is intended to satisfy most entrance requirements to post-graduate programs. Students work closely with academic and pre-professional advisors to assure that requirements for specific programs are fulfilled.

Animal Industry (See **Appendix J** for example plan of study.)

Students receive training in nutrition, breeding and genetics, reproduction, and management of domesticated animals. This option prepares students for careers in agribusiness, farm management, technical sales and (or) service, cooperative extension, education, government, and commodities promotion. Within the Animal Industry option, students can specialize in one of three areas:

- Equine: Emphasis on biology and management of equine animals.
- Livestock: Emphasis on biology and management of meat-producing animals.
- Dairy: Emphasis on biology and management of commercial milk-producing animals.

Food Industry (See **Appendix J** for example plan of study.)

Students receive training that emphasizes scientific disciplines related to processing, chemistry, and safety of animal-derived foods. This option prepares students for careers in animal production or the associated food processing industries.

As mentioned previously ASC courses serve a significant number of students from outside ASC. Several majors within CAFE rely on ASC courses to fulfill pre-major, major, and (or) specialty support requirements for undergraduate degrees. ASC courses (**Appendix I**) that consistently have large non-major enrollment include: ASC 101 (required by Career and Technical Education, Equine Science and Management, and Plant and Soil Sciences–Crops and Livestock option), ASC 102 (required by Career and Technical Education and Plant and Soil Sciences–Crops and Livestock option), ASC 310 (required by EQM), ASC 320 (required by EQM), ASC 364, ASC 382 (required by Sustainable Agriculture), and ASC 410G.

Unique Aspects of the Animal Sciences Curriculum

As in most land grant institutions offering similar degree programs, much of the instructional activity occurs in traditional classroom settings through lecture and discussion. However, there is a strong commitment to experiential learning and the inclusion of hands-on laboratory activities, such as animal and organ systems examination and dissection (ASC 101 and ASC 364), use of computer analytical techniques and software (ASC 378), and use of virtual labs (ASC 362). Several courses place significant emphasis on animal handling and management (ASC 102, ASC 320, ASC 340, ASC 364, ASC 404G, ASC 406, ASC 408G, and ASC 410G). Animal handling and management-oriented courses extensively use UK owned flocks and herds at the various farm units for labs.

All students enrolled in CAFE are now required to have an Academic Enrichment Experience. ASC majors can satisfy this requirement in a number of ways, including undergraduate research, internships, study abroad, and peer mentorship programs. See *Academic Enrichment Experience* later in this section.

Departmental faculty mentored 176 students in ASC 395 (Special Problems in Animal Science) between fall, 2011 and fall, 2017. Our faculty also mentor student research projects through ABT 395, which is offered through the Agricultural and Medical Biotechnology undergraduate program. Eighty-two ASC majors completed internships (ASC 399) during this review period. Three animal- or equine-based summer study abroad programs were offered between 2015 and 2017. Twenty-five ASC majors participated in these trips. Numerous other students have participated in study abroad programs through UK's Education Abroad program.

In addition, we have developed extensive undergraduate peer instructor opportunities. Successful students from previous years are recruited to provide instructional assistance to students currently enrolled in courses like ASC 101, ASC 102, and ASC 404G. At least 30 undergraduates have served as peer instructors each year for the past six years. Student instructors receive course credit through ASC 333 or GEN 300.

Beyond formal courses, students have a diverse array of opportunities for employment within the department. Each of the animal production units employs student workers to assist with both animal husbandry and research. Students are also hired by individual researchers to work at the farms or in the laboratory. We currently have 28 undergraduate students working at the farms and 12 working in laboratories on campus.

Student Enrollment in Animal Sciences

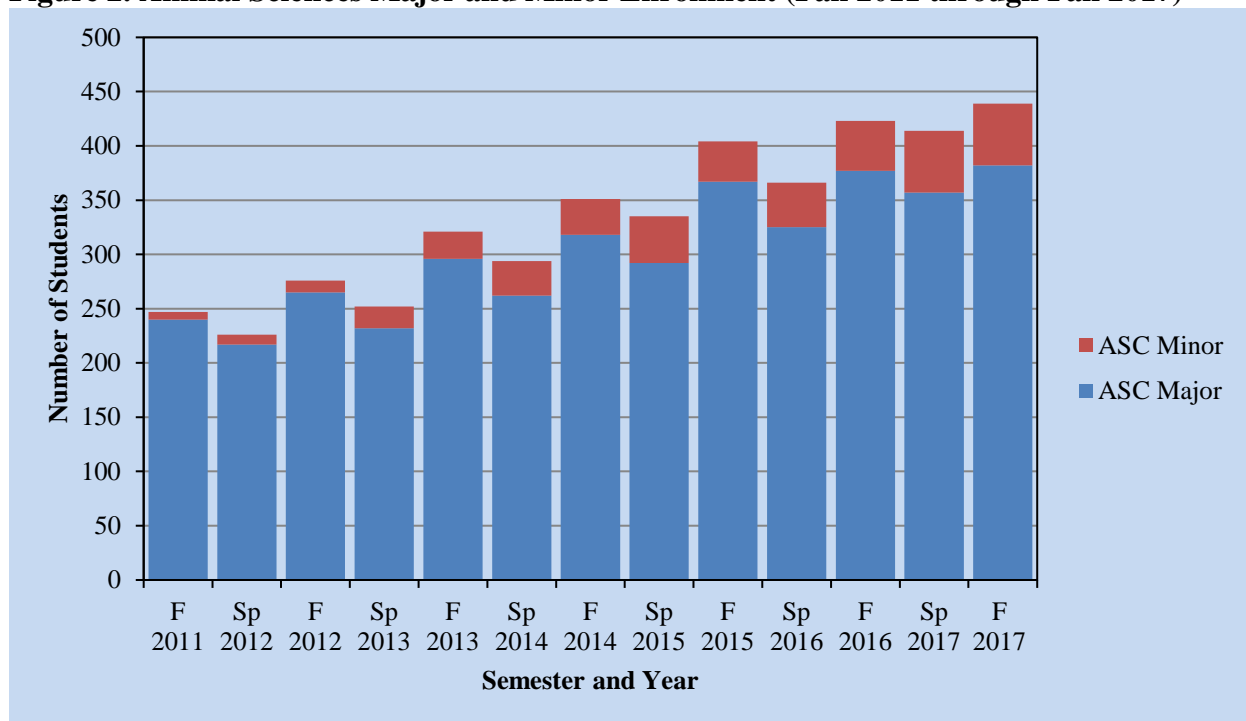
Student enrollment in Animal Sciences has steadily increased since the fall of 2011. In addition to an increase in the number of majors, we have also seen a significant increase in students seeking a minor in Animal Sciences. Trends in enrollment are shown in **Figure 2** and further details are provided in **Table 8**.

Table 8. Animal Sciences Enrollment Details

Semester	Pell Grants, %	Honors College, %	First Generation, %	Female, %	Resident, % ^a
Fall 2011	24.2	4.6	17.5	77.1	70.4
Spr 2012	23.5	5.1	16.6	76.5	72.8
Fall 2012	24.2	5.3	15.1	79.6	66
Spr 2013	22.8	5.2	15.9	81.0	69
Fall 2013	25.3	4.1	16.9	79.1	68.2
Spr 2014	25.6	5	19.1	76.0	69.5
Fall 2014	28.6	4.7	19.5	78.0	64.2
Spr 2015	29.5	5.8	18.8	77.7	65.1
Fall 2015	26.7	7.9	16.6	80.9	62.9
Spr 2016	24.3	8.3	15.4	80.6	61.2
Fall 2016	25.7	9.3	15.6	81.8	62.1
Spr 2017	22.4	10.6	14.6	81.8	62.5
Fall 2017	22.0	9.8	19.6	82.2	56.8
University Average 2011-2017	23.4	6.2	17.6	52.0	73.9

^aDistribution of international students ranged from a low of 0.3 (Spr 2017) to a high of 1.8 % (Spr 2012) with an average of 0.7%.

Figure 2. Animal Sciences Major and Minor Enrollment (Fall 2011 through Fall 2017)



Animal Sciences Advising

Undergraduate students majoring in Animal Sciences are advised by either the Academic Coordinator (Ann Leed) or an Animal Sciences faculty member (**Table 9**). Incoming freshman, transfer students, and students changing their major to Animal Sciences are initially assigned to the Academic Coordinator. Working with the Academic Coordinator, they each develop an individualized, four-year plan of study. For incoming freshman, the Academic Coordinator advises those students until the summer prior to their junior year. At that time, students are re-assigned to a faculty member based on their area of interest or to an advisor requested by the student. Transfer students and major changes are handled on a case-by-case basis in terms of their re-assignment to a faculty member. All students are required to meet with their academic advisor twice a year in order to register for the next semester's courses. Over time, much of the advising responsibilities for upperclassmen have fallen on a few individuals in the department (**Table 9**).

Advisor	Fall 2011/ Spr 2012	Fall 2012/ Spr 2013	Fall 2013/ Spr 2014	Fall 2014/ Spr 2015	Fall 2015/ Spr 2016	Fall 2016/ Spr 2017
Aaron, Debra K.	31/27	17/11	10/9	5/5	15/17	21/19
Adedokun, Tayo					8/6	8/6
Bewley, Jeffery					9/7	9/9
Bridges, Phillip			5/5	5/8	8/9	6/4
Cantor, Austin	104/61	47/36	29/18	2/2	2/0	
Coleman, Robert ^a	3/3	4/4	1/1	1/1	1/1	
Ely, Donald	13/13	9/7	5/3			
Dwyer, Roberta ^b					0/1	2/2
Harmon, David					8/8	15/13
Lawrence, Laurie			2/2	7/8	13/11	15/12
Leed, Ann ^c	0/43	127/120	170/173	250/228	217/204	224/205
Lindemann, Merlin					7/7	11/10
Matthews, James			3/3	3/3	3/3	1/0
Rentfrow, Gregg			4/5	6/6	10/10	7/5
Silvia, William	48/34	25/22	25/20	14/14		
Urschel, Kristine ^a		2/1	1/1	2/2	10/10	17/17
Vanzant, Eric	18/17	12/10	16/15	17/17	21/20	20/18

^aAdvised additional EQM majors.

^bStudent(s) returning for secondary degree for admission to veterinary school.

^cAcademic Coordinator, advises all ASC majors during first 2 years in program.

Animal Sciences Retention

Percentages of students within the cohort who were retained by and graduated from UK over a 6-year period are shown in **Table 10**. Corresponding data for students within the cohort who were retained in and graduated from CAFE are also shown in **Table 11**. Retention of students starting their undergraduate degree in Animal Sciences is comparable and, in some cases, slightly better

than either the University (**Table 10**) or College (**Table 11**) as a whole. Graduation rates are also comparable.

Table 10. Retention and Graduation Rates of Animal Sciences Students at UK (2011-16)								
		Retention from 1st Fall Enrollment to, %					Graduated in, %	
		1st Spring	2nd Fall	3rd Fall	4 th Fall	5 th Fall	4 Years	5 Years
Fall 2011	56	89.5	71.9	68.4	64.9	21.1	41.1	50.0
Fall 2012	73	94.5	82.2	78.1	72.6	26.0	50.7	
Fall 2013	97	96.9	87.6	78.4	74.2	18.6		
Fall 2014	94	92.6	84.0	72.3	63.8			
Fall 2015	102	90.2	84.3	70.6				
Fall 2016	92	91.3	87.0					
University Average, 2011-16		92.9	68.7	74.4	68.8	27.7	42.3	60.8

Table 11. Retention and Graduation Rates of Animal Sciences Students in the CAFE (2011-16)								
		Retention from 1st Fall Enrollment to, %					Degree Completion, %	
		1st Spring	2nd Fall	3 rd Fall	4 th Fall	5 th Fall	4-Year	5-Year
Fall 2011	56	80.7	66.7	50.9	45.6	8.8	33.9	37.5
Fall 2012	73	91.8	69.9	58.9	52.1	16.4	39.7	
Fall 2013	97	90.7	76.3	61.9	54.6	13.4		
Fall 2014	94	89.4	79.8	67.0	58.5			
Fall 2015	102	84.3	76.5	60.8				
Fall 2016	92	85.9	79.3					
College Average, 2011-16		89.2	74.7	62.2	54.5	13.1	41.8	51.2

Effectiveness of the Undergraduate Animal Sciences Teaching Program

Student Learning Assessment

Effectiveness of the undergraduate Animal Sciences teaching program is evaluated through formal assessment of student learning. To facilitate this assessment, the Department of Animal and Food Sciences has identified four major learning objectives:

Objective 1: Students will demonstrate knowledge of scientific principles and the application of those principles to animal and food production systems.

Objective 2: Students will formulate and coherently support positions using written, oral, and visual communication skills.

Objective 3: Students will recognize and respect diverse viewpoints when deriving solutions to challenges related to animal and food production systems.

Objective 4: Students will effectively acquire, assimilate, analyze, and report scientific information.

Assessment is based on effectiveness in these four critical areas. For example, a comprehensive test that broadly covers subject material within Animal Sciences is given to students in ASC 101 (Domestic Animal Biology) and in ASC 470 (Capstone for Animal Agriculture) to assess Objective 1. In a similar manner, the California Critical Thinking Skills Test (CCTST) is administered to both groups of students. This test is not discipline specific. It is designed to evaluate student skills in analysis, inference, evaluation, deductive reasoning, and inductive reasoning. This test is used to assess instructional effectiveness under Objective 4. Both the internally developed knowledge test and the CCTST were used for the first time in 2010. As students advance through our program, progress can be assessed on the same individuals over time. Writing, oral, and visual communication skills (Objective 2) are evaluated through contracted courses with the Department of Writing, Rhetoric and Digital Studies (WRD 203 Business Writing or WRD 204 Technical Writing). Another test, the California Critical Thinking Dispositions Inventory, is administered to the students in ASC 470 to evaluate Objective 3.

Teacher Course Evaluation

Students provide another measure of effectiveness through Teacher Course Evaluation (TCE). Average scores for ASC courses are shown in **Table 12**. For comparison purposes, corresponding averages are provided for all courses in CAFE. As can be seen in **Table 12**, average student evaluations of courses and teaching are consistently comparable or better than College averages.

Table 12. Teacher Course Evaluation (TCE) Response Rate (Resp., %) ^a and Scores by Department and College									
Semester	Animal Sciences				College of Agriculture, Food and Environment				
	Resp., % ^a	Value of Course	Resp., % ^a	Quality of Teaching	Resp., % ^a	Value of Course	Resp., % ^a	Quality of Teaching	Evaluation Method
Fall 2011	64.0	3.4	63.8	3.5	69.7	3.4	69.3	3.5	Mandatory In-class
Spr 2012	73.9	3.4	73.9	3.4	71.9	3.4	72.1	3.5	Mandatory In-class
	31.7	3.8	31.7	3.9	68.4	3.4	68.4	3.6	Optional Online
Fall 2012	76.8	3.4	76.6	3.4	74.8	3.4	74.6	3.4	Mandatory In-class
Spr 2013	76.3	3.6	76.1	3.6	74.5	3.5	74.3	3.5	Mandatory In-class
Fall 2013	65.9	3.4	65.8	3.5	75.9	3.5	75.8	3.5	Mandatory In-class
Spr 2014	Data not available								
Fall 2014	Data not available								

Table 12. Teacher Course Evaluation (TCE) Response Rate (Resp., %) ^a and Scores by Department and College									
Semester	Animal Sciences				College of Agriculture, Food and Environment				
	Resp., % ^a	Value of Course	Resp., % ^a	Quality of Teaching	Resp., % ^a	Value of Course	Resp., % ^a	Quality of Teaching	Evaluation Method
<i>(continued from previous page)</i>									
Spr 2015	45.3	3.36	46.9	3.43	53.0	3.36	58.1	3.45	Optional Online
Fall 2015	53.4	3.05	62.2	3.08	56.6	3.29	64.5	3.4	Optional Online
Spr 2016	43.7	3.34	49.0	3.41	51.8	3.35	56.1	3.48	Optional Online
Fall 2016 ^b	56.2	4.2	77.6	4.2	58.1	4.3	67.7	4.3	Optional Online
Spr 2017 ^b	54.1	4.3	49.3	4.4	45.7	4.3	49.7	4.4	Optional Online

^aResponse rate (Resp., %) = (Number of students responding/Number of students invited) × 100.

^bEvaluation metrics changed from 1 to 4 to 1 to 5 scale.

In the fall of 2014, UK switched from a mandatory in-class student evaluation of teaching to a non-mandatory (optional) online student evaluation system. One of the problems with TCE scores, since that change, is that a low percentage of students actually complete the evaluations (**Table 12**), thus, results are likely to be biased. This is a university-wide issue and discussions are ongoing as to how to rectify this problem.

Student Enrollment

Another measure of effectiveness is student enrollment. See previous section on *Student Enrollment in Animal Sciences*. Enrollment in the ASC major continues to grow, with current enrollment at 382. This represents a 67% increase in student enrollment since the last departmental review (382 versus 228).

Professional Activities to Improve Instructional Efforts

ASC teaching faculty and staff routinely participate in workshops, both on campus and nationally, that are geared to improving teaching effectiveness. Attendance and participation in teaching paper sessions at professional meetings, such as American Society of Animal Science (ASAS), American Dairy Science Association (ADSA), North American Colleges and Teachers of Agriculture (NACTA), and National Association of Equine Affiliated Academics (NAEAA), also improve instructional efforts. **Appendix J** lists specific teaching activities for individual faculty and staff.

Animal Sciences Academic Enrichment Experience

All students enrolled in CAFE are required to complete an Academic Enrichment Experience (AEE). ASC students can fulfill their AEE by completing one of the following courses:

ASC 333: Topics in Animal Science (Scholar of Teaching and Learning in Animal Sciences)

- Student is a peer instructor for ASC 101 Domestic Animal Biology.

- Student completes the ASC 101 Peer Instructor Form (<https://afs.ca.uky.edu/files/asc-101-ta-approval-form-6-5-2017.pdf>).
- Student obtains approval to be a peer instructor for ASC 101 by the course instructor.
- The Academic Coordinator for Animal Sciences or the Ag Advising Office issues a course override. Student are enrolled in the correct section of ASC 333.
- Student completes requirements outlined by the course instructor.
- Student receives a letter grade at the end of the semester.

ASC 395: Special Problem in Animal Science (Undergraduate Research)

- Student works with a faculty member to identify an undergraduate research project.
- Student and faculty complete the Undergraduate Independent Study Contract.
 - 1 credit hour – 48 hours of work
 - 2 credit hours – 96 hours of work
 - 3 credit hours – 144 hours of work
- Student obtains necessary signatures on the contract and submits the contract to the Ag Advising Office. The Ag Advising Office registers the student for ASC 395.
- Student receives a letter grade at the end of the semester based on the body of work they have performed.

ASC 399: Experiential Learning in Animal Science (Internship)

- Student reviews the following documents:
 - Internship requirements (<https://afs.ca.uky.edu/files/internship-requirements-6-5-2017.pdf>).
 - Internship learning contract for ASC/Pre-Vet Students (<https://afs.ca.uky.edu/files/learning-contract-for-asc-pv-students-6-5-2017.pdf>).
 - Internship learning contract for all other ASC Students (<https://afs.ca.uky.edu/files/learningcontractforascstudents6-16-2017.pdf>).
 - Internship supervisor contract for ASC/Pre-Vet Students (<https://afs.ca.uky.edu/files/internship-supervisor-contract-for-asc-pv-students-6-5-2017.pdf>).
 - Internship supervisor contract for all other ASC Students (<https://afs.ca.uky.edu/files/internship-supervisor-contract-for-asc-students-6-5-2017.pdf>).
- Student secures experience/internship to fulfill ASC internship requirement and meets with internship supervisor to determine duties, learning objectives, contact hours, etc.
 - Must be a minimum of 48 contact hours
 - ✓ 1 credit hour – 48 contact hours
 - ✓ 2 credit hours – 96 contact hours
 - ✓ 3 credit hours – 144 contact hours
 - Must meet minimum academic requirements
- Student schedules a meeting with Academic Coordinator (Animal Sciences or Pre-Vet as appropriate) BEFORE beginning internship.
- Student fills out Supervisor Contract with internship supervisor and returns completed Supervisor Contract to the appropriate Academic Coordinator.

- Once the Supervisor Contract is received and approved, the Learning Contract is completed and signed by the Academic Coordinator.
- Student takes Learning Contract to be signed by ASC Director of Undergraduate Studies.
- Completed Learning Contract is delivered by student to the Director of Career Development and Academic Enrichment. (Once Learning Contract is received and processed, student is added to ASC 399 for the appropriate credit hours.)
- Once all assignments are completed and student has met with the appropriate Academic Coordinator, a pass/fail grade is assigned.

EAP 599: Study Abroad

- Student works with the UK Education Abroad Office to apply for an education abroad experience.
- Student enrolls in EAP 599 for the semester or summer traveling abroad.
- Student fulfills the requirements of EAP 599 (pre-departure meeting, post-departure meeting, and seminar).
- A pass/fail grade is given to the student at the end of the semester.

GEN 300 CAFE Peer Instructor

- Student is a peer instructor for GEN 100 Issues in Agriculture, Food and Environment or an Animal Sciences undergraduate course, other than ASC 101. Other GEN 300 courses will not fulfill the AEE requirement (for example, Climate Change and Agriculture).
- Student and course professor complete the GEN 300 Peer Instructor Registration Form (<https://afs.ca.uky.edu/files/peer-instructor-form-6-5-2017.pdf>).
- Student obtains necessary signatures and submits the contract to the Ag Advising Office. The Ag Advising Office registers student for the correct section of GEN 300.
- Student completes the requirements as outlined by the course professor.
- A pass/fail grade is given to the student at the end of the semester.

Other

- In some cases, students can complete their AEE by competing on the Livestock Judging Team, Meats Judging Team, Dairy Judging Team, or Dairy Challenge Team.
- In these situations, a student works with a faculty sponsor, as the student will need to complete a tangible product (report, article, poster, etc.).

Animal Sciences Extracurricular Activities (Clubs, Judging Teams)

AFS is home for four judging teams: Livestock, Dairy Cattle, Meats and Animal Welfare. Graduate Teaching Assistants typically coach the Livestock, Dairy Cattle, and Meats teams, but a faculty or staff member supervises each graduate student coach. Faculty from our department are currently, or have been, primary advisors to the UK Dressage and Eventing, Equestrian, Polo, and Saddle Seat teams. In addition, faculty advise numerous student clubs and organizations (**Table 13**).

Clubs/Teams	Advisor(s)
Animal Welfare Judging Team	Camie Heleski, Joao Costa
Block and Bridle Club	Debra Aaron, Donald Ely
Dairy Challenge Team	Donna Amaral-Phillips
Dairy Club	Jeffrey Bewley
Dairy Cattle Judging Team	George Heersche
Delta Zeta Sorority	Jackie Wahrmond
Equestrian Team	Robert Coleman
Horse Racing Club	Laurie Lawrence
Livestock Judging Team	Steve Austin
Meats Judging Team	Gregg Rentfrow
R.E.A.D.	Kristine Urschel
Saddle Seat Team	Mary Rossano
Sigma Alpha Sorority	Ann Leed

Animal Sciences Student Recognition

ASC majors have been successful in earning recognition for themselves and the Department. From fall 2011 to spring 2017 (12 semesters), an average of 25.6% of our students achieved the Dean’s List (**Table 14**). Also, an average of 20% of fall graduates and 38% of spring graduates (28.9% overall) finished their academic careers with honors (*cum laude* or better) over the last 6 years (**Table 15**). With regard to scholarships, 81 ASC majors (83% of those who completed scholarship applications) were awarded a total of \$221,225.00 for the 2017-2018 academic year by CAFE.

Semester	ASC Students Achieving Dean’s List (%)
Fall 2011	21.3
Spring 2012	21.2
Fall 2012	26.0
Spring 2013	23.7
Fall 2013	22.6
Spring 2014	22.9
Fall 2014	34.9
Spring 2015	25.6
Fall 2015	30.6
Spring 2016	27.8
Fall 2016	27.2
Spring 2017	22.8
Average	25.6

Table 15. Animal Sciences Majors Receiving Graduation Honors (%)	
Semester	Percent Graduation Honors (Cum Laude or higher), %
Fall 2011	11.1
Spring 2012	26.3
Fall 2012	20.0
Spring 2013	50.0
Fall 2013	8.3
Spring 2014	29.5
Fall 2014	36.4
Spring 2015	45.5
Fall 2015	27.3
Spring 2016	30.0
Fall 2016	16.7
Spring 2017	46.2
Average	28.9

Numerous students have presented results from their research projects (ASC 395) at professional meetings. Departmental clubs, like Block and Bridle and Dairy Club, are routinely recognized for outstanding club activities at regional and national meetings.

Teaching and Advising Recognition of Faculty and Staff

Faculty and staff in AFS have been recognized consistently for excellence in teaching, both internally at the college and university level and nationally by professional organizations. Award recipients during the review period include:

Debra Aaron

- Joe T. Davis Outstanding Advisor Award (Student nominated), UK CAFE, 2012
- Fellow (Teaching), American Society of Animal Science, 2012
- Distinguished Teacher Award, American Society of Animal Science, 2013
- “20 Outstanding Animal Science Professors,” VetTechColleges.com, 2013

Jeffrey Bewley

- Early Career Outstanding Teacher Award, (Student nominated), UK CAFE, 2011
- Outstanding Advisor Award, Student Affiliate, American Dairy Science Association, 2013

Phillip Bridges

- Early Career Outstanding Teacher Award, (Student nominated), UK CAFE, 2011

Fernanda Camargo

- Teacher Who Made a Difference (Student nominated), 2015 and 2017

Robert Coleman

- Joe T. Davis Outstanding Advisor Award (Student nominated), UK CAFE, 2015

Roberta Dwyer

- Joe T. Davis Outstanding Advisor Award, (Student nominated), UK CAFE, 2011
- UK Great Teacher Award (Student nominated), UK Alumni Association, 2013

Don Ely

- Outstanding Teacher Award, (Student nominated), UK CAFE, 2015

Ann Leed

- Early Career Outstanding Teacher Award, (Student nominated), UK CAFE, 2015

Gregg Rentfrow

- Teacher Who Made a Difference (Student nominated), 2017

Mary Rossano

- Teacher Who Made a Difference (Student nominated), 2014

Bill Silvia

- Provost's Award for Outstanding Teaching for Tenured Faculty, UK, 2012
- United States Department of Agriculture Food and Agriculture Sciences Excellence in Teaching Award, 2013
- Teaching Award, American Dairy Science Association, 2015

Major Limitations/Challenges/Needs

Enrollment in the ASC major continues to grow, with current fall 2017 enrollment at 382. This represents a 67% increase in student enrollment since the last departmental review (382 versus 228). This growth has led to several challenges, including:

- The current growth ASC has experienced taxes the instructional and advising capabilities of the current faculty. We currently have 9.41 FTEs teaching ASC courses (**Table 16**). This includes all faculty and staff teaching and (or) advising ASC students and is based on Distribution of Effort (DOE) figures. This represents a 7% decrease since the 2009-2010 academic year. Therefore, the department is actually doing more with less. We are serving more students with fewer faculty and staff resources. There are no signs that enrollment in ASC has peaked, but decreasing numbers of instructors and advisors affect future growth.

Academic Year	Teaching FTE (Based on DOE)	Average ASC Enrollment (Major and Minor)
2011-2012	6.41 ^a	237
2012-2013	7.34 ^{ab}	264
2013-2014	7.45 ^{abc}	308
2014-2015	7.28 ^{abc}	343
2015-2016	8.27 ^{abc}	385

Table 16. Full Time Equivalents (FTE) of Faculty and Staff Teaching ASC Courses

Academic Year	Teaching FTE (Based on DOE)	Average ASC Enrollment (Major and Minor)
<i>(continued from previous page)</i>		
2016-2017	9.32 ^{abcd}	419
2017-2018	9.41 ^{abcd}	439

^aExcludes Food Science Faculty and ESM Lecturer Elizabeth James.

^bInclude ASC Academic Coordinator Ann Leed.

^cIncludes Ag Extension Associate Senior Amy Lawyer.

^dIncludes Lecturers Jackie Wahrmond and Camie Heleski, and Pre-Vet Academic Coordinator Colette Tebeau.

- Available classroom and appropriate laboratory space has not kept pace with the increasing enrollment number. Finding classroom space to accommodate larger class sizes often means meeting in locations that are not ideally located near the agriculture campus.
- The course fees the University will AFS to charge are insufficient to cover the growing costs of laboratory supplies and transportations costs associated with transporting students to and from the farm units for laboratories.
- Many of the laboratories currently held at one of the animal units could be held on campus if funds were available to construct an on-campus teaching pavilion that included animal handling facilities. This would also reduce transportation costs associated with transporting students to the animal units.

Food Science Undergraduate Program

Overview

In Kentucky, food product manufacturing (e.g. meat and dairy processing, and distillation of spirits) is the third largest manufacturing segment behind transportation and industrial machinery. In addition to food product manufacturing there are Kentucky-based restaurants businesses such as Yum Brands that by itself accounts for about \$11 billion in annual revenues. Our graduates enjoy a broad range of food science opportunities and have experienced nearly 100-percent placement with an average entry-level annual salary for food scientists with a B.S. degree exceeding \$55,000 in 2012. Over the last 9 years the top employer of our graduates include Brown-Forman, Kroger, Nestle Foods and flavor companies located in the Cincinnati area (including Wild-Flavors and Givaudan).

Agricultural production is the foundation for the long-term prosperity of any society, and improving the economical conversion of agriculture commodities into wholesome and nutritious foods is the goal of the food scientist. Our eight FSC faculty in the department (ca. 4.5 FTE research, 1.87 FTE teaching, and 1.58 FTE extension) have made significant contributions to the productivity of AFS. The scope of this section is limited to the undergraduate program. The food science research, graduate education and extension components are addressed in other sections of this document.

AFS offers an undergraduate degree in FSC within CAFE. The degree requirements are described in **Appendix L**. The individual course descriptions can be found in **Appendix M**.

Food Science Teaching Personnel

The UK Food Science program currently has seven teaching faculty with 1.87 Full-time Teaching Equivalents (FTE). **Table 17** outlines current faculty's emphasis and courses. Supporting teaching facilities include an abattoir and carcass processing facilities, but does not include functional food processing facilities.

Table 17. Food Science Teaching Faculty during 2011-17		
Name	Specialization	Course(s) Taught
Youling Xiong	Protein Chemistry	FSC 434G* Food Chemistry
		FSC 630 Advanced Meat Science
		FSC 638 Food Proteins
William Boatright	Lipid Chemistry	FSC 434G* Food Chemistry
		FSC 535* Food Analysis
		FSC 640 Food Lipids
Melissa Newman	Food Microbiology	FSC 530* Food Microbiology
		FSC 540 Food Sanitation
		FSC 632 Foodborne Disease Agents
Gregg Rentfrow	Meat Science	ASC 300 Meat Science
Surendranath Suman	Muscle Foods	ASC 304* Animal Derived Foods
		FSC 430* Sensory Evaluation of Foods
Rachel Schendel ^a	Carbohydrate Chemistry	FSC 306* Introduction to Food Processing
		FSC 538 Food Fermentation and Thermal Processing
Paul Vijayakumar	Extension, Food Processing	FSC 107* Introduction to Food Science
		FSC 536* Advanced Food Technology

^aHired in June, 2017

*Indicates IFT required course

Table 18 lists faculty that taught FSC courses during the 2011-17 review period that have retired.

Table 18. Retired Faculty Members that Taught Food Science Courses during 2011-17		
Name	Specialization	Course(s) Taught
Clair Hicks ^a	Dairy Chemistry	FSC 306* Introduction to Food Processing
		FSC 430* Sensory Evaluation of Foods
		FSC 536* Advanced Food Technology
Joe O'Leary ^b	Food Processing	FSC 107* Introduction to Food Science
		FSC 306* Introduction to Food Processing
		FSC 538 Food Fermentation and Thermal Processing

^aClair Hicks retired at the end of the Fall semester 2016. His position was filled by Rachel Schendel, who will begin teaching FSC 306 in Fall of 2017 and FSC 538 in Spring of 2018.

^bJoe O'Leary (Ph.D. Minnesota) was retired as Jan. 2014 and taught FSC 107* in Spring 2014. Dr. Paul Priyesh Vijayakumar was hired in 2015 to fill this faculty line.

*Indicates IFT required course

Dr. Fred Payne, whose appointment was within UK's Biosystems and Agricultural Engineering (BAE) Department, taught AEN 340 Food Engineering, which is an IFT required course. Dr. Payne retired in the spring of 2014, and beginning in the fall of 2014, Dr. Bode Adedeji in BAE began teaching our program's Food Engineering class. The Food Science faculty were heavily involved in the search committee, interviewing process and hire process for this position.

Food Science Curriculum

The FSC B.S. curriculum is designed not only to meet the requirements of UK, but also to meet the criteria for our accrediting organization, the Institute of Food Technologists (IFT). The attached IFT Accreditation Packet outlines our Student Learning Outcomes and Curriculum assessments in 2014 (**Appendix N**).

The curriculum underwent major and minor changes in 2014-2015 due to outside departmental restructuring, notably declaring WRD 203 as our listed GCCR requirement, solidifying our MA requirement as a single 4 credit Calculus class, updating our STA requirement to a single STA 296 course, decreasing the number of elective credits from 15 to 3, and decreasing our overall credit hours required for graduation from 128 hours to 120 hours (**Appendix O**). The proposed changes simplified the written format of our curriculum to be more easily understood by other programs and prospective students, and created a more structured approach to advising students over a four-year degree.

Unique Aspects of the Food Science Curriculum

We currently have six required FSC courses, and four additional FSC courses of which students must choose three. Five of the six required courses include laboratories with hands-on components, and all four additional FSC courses contain hands-on laboratories (**Appendix N**). Students are taught to perform relevant food microbiological testing methods, shown how to use a variety of laboratory equipment for broad FSC research, shown processing equipment, chemical and sensorial analyses, and are required in most cases to write reports and analyze data from the laboratories.

Food Science Enrollment

Enrollment in the UK FSC program during the last few years has remained consistently higher than any time during the existence of the program. There are approximately 36 undergraduates currently enrolled in our FSC program. The average undergraduate enrollment during the 2011-2017 period was 36 (**Appendix P**). There are eight FSC professors in the AFS department, with seven involved in teaching the IFT accredited curriculum (approximately 1.87 teaching FTEs).

Food Science Advising

From 2011-14, various FSC faculty were assigned students to advise for the duration of their degree, with students being able to transfer to another faculty mentor if desired. Advising duties included attending Orientation registration events organized by CAFE, and meetings to discuss course plans once per semester to lift advisor holds on accounts. In Fall 2014, the FSC program hired a new dual position that includes Academic Coordinating as 25% portion of the essential duties. Currently, the Academic Coordinator advises all students, including transfer and

international students, for their first two years before the student chooses a faculty mentor for the final two years at UK. Four of the 36 students enrolled as of Fall 2017 currently have been assigned to faculty mentors. Plans to efficiently transition student advising to faculty mentors are being explored as the advising format is still relatively new.

Food Science Retention

Retention rates have varied between 2011-15, with the addition of UK Analytics Tableau software allowing for more accurate tracking (**Appendix Q**). Our program is rigorous, and retention tends to drop during the second year. Anecdotally, this is due to our chemistry and mathematic prerequisites, which students must complete in a timely manner to stay on track for a four-year degree.

Assessment of the Undergraduate Food Science Program

UK is home to the only nationally accredited FSC program in the state of Kentucky. The most recent re-accreditation was obtained in December 2014 (**Appendix B**) from the Institute of Food Technologists (IFT; a national organization that reviews all major FSC programs in the U.S.). The next re-accreditation is to occur during the 2018-19 school year. The *UK Food Science program Institute of Food Technologists Re-Accreditation Application* provides summaries of recent assessments to our curriculum (for both IFT and UK assessment), and an overview of the modifications made as a result of assessments from 2009-14 (**Appendix N**).

Food Science Academic Enrichment Experience

The Food Science Academic Enrichment Experience (AEE) was designed to enhance the learning objectives of our FSC program, and these opportunities have proven effective in preparing students for future careers. Beginning in 2015, our curriculum established the AEE as a requirement for our program rather than an elective enhancement. Students must complete a minimum of three credit hours, repeatable up to six hours, using three AEE categories.

- FSC 399: Work experience, paid or unpaid, completing a minimum of 200 hours (equivalent to 5 weeks of full time employment). Activities are expected to enhance or extend the learning objectives defined by the FSC program in its learning objectives. Students have completed internships at major food companies performing product development or quality assurance and at several non-profit food organizations,
- FSC 395: Research or Independent Study, a student is expected to acquire a thorough understanding of the rationale for the research and be the primary person involved in obtaining and analyzing data.
- EXP 396: Experiential Education, a community-based or field-based learning experience under the supervision of a faculty member. Study abroad opportunities are able to be considered for EXP 396.

In all categories, students must submit learning contracts defining the learning objectives, grading expectations and assignments, and specific duties of the project, internship, or travel. The learning contracts adhere to a standard format (**Appendix R**), and are produced during a meeting with the student and faculty supervisor. The agreed contracts are signed by the student,

faculty supervisor (usually the DUS for FSC unless otherwise specified), and the AFS Department Chair, then sent to CAFE Student Success Center for course enrollment.

Once the experience is completed, the students are required to present oral presentations usually accompanied by a slide presentation detailing their work or travel, including the essential duties and/or learning objectives, as part of their contracted assignment. After evaluating the student performance in completing the learning objectives, the faculty supervisor assigns a pass/fail to the course grade.

Food Science Clubs and Advisors

The FSC Club is made up of both undergraduate and graduate students, and participates in IFT annual events. Faculty advisors are rotated every two years, with the current advisors listed as Dr. Vijayakumar and Dr. Boatright.

Since 2014, the FSC club has participated in an Annual IFT Student Night. The event brings food professionals from the Bluegrass Region to UK for a Question and Answer Panel, allowing students to ask questions and learn more about future careers. Students also have participated in the Bluegrass IFT Suppliers Night fundraiser each year. While responsible for set up of the event, it allows them the opportunity to interact with future employers. All FSC students are invited to the monthly meeting held by the Blue Grass section of the IFT. The club also regularly performs food drives to support local food banks and fund raisers to for “Dance Blue” to support children’s cancer research. Additionally, a group of students participated in the 2016 IFT Student Product Development Competition, creating a cold coffee with reduced bitterness.

Food Science Student Scholarships

Several scholarships are available for FSC undergraduate students. These include:

- Ezra “Demp” Alford Food Science Scholarship
- Animal and Food Science Alumni Scholarship
- Lee Edgerton Scholarship
- Clair Hicks Scholarship
- Jim Kemp Scholarship
- Mid-States Meat Association Scholarship
- William Moody Scholarship
- Institute of Food Technology Scholarship

Notable Food Science Program Accomplishments

- Establishment of the Food Systems Innovation Center (FSIC) which provides research opportunities for undergraduate FSC students (ca. 2011)
- Increased enrollment from an average of 25 during the 2005-10 period to an average of 36 during the 2011-17 period.
- Program re-accreditation by the IFT in 2014
- Successfully filled two faculty positions during 2015 (O’Leary position) and 2017 (Hicks position)

- Created and filled the part-time position of FSC undergraduate Academic Coordinator (Leeann Slaughter) in 2014
- Participated in hiring new Food Engineering position in BAE and changed the course frequency from every-other-year to every-year.
- Approval of the FSC Graduation Composition and Communication Requirement (GCCR) program (2015).
- Establishment of the Ezra “Demp” Alford scholarship fund in 2017

Notable aspect of Undergraduate Education: Research, funded by competitive grants, not only exposes undergraduate students to cutting-edge technology, but also makes advanced analytical instruments available for teaching activities. Research programs also provide students with professors who are well versed in current technology and current trends in the industrial, governmental and academic sectors, which will later provide employment. The FSC faculty at UK has been highly successful at obtaining prestigious nationally competitive grants (e.g., USDA AFRI grants) and national/international professional awards.

Major Limitations/Challenges/Needs

The best way to address the resources, and support, that our FSC Undergraduate program has is to compare UK program to our benchmark universities. The list of UK benchmark universities can be found at <http://www.uky.edu/ie/content/benchmark-institutions>, and comparable IFT-accredited universities are outlined below. Important metrics to consider include faculty numbers and supporting educational facilities (e.g., food processing pilot plants).

University of Kentucky Food Science (7 teaching faculty with 1.87 teaching FTEs)

- ✓ Supporting Teaching Facilities – Animal Lab, but no functional food processing facilities

University of California-Davis (26 faculty)

- ✓ California Processing Tomato Industry Pilot Plant
- ✓ August A. Busch III Brewing & Food Science Laboratory
- ✓ Milk Processing Laboratory

Iowa State University (ca. 34 faculty)

- ✓ *Wet Processing Pilot Plant* - The 5,000-square-foot pilot plant incorporates a variety of wet-processing systems. Steam (including culinary quality), water and electrical connections have been designed to facilitate rearrangement and modification of processing machinery, test stands and related equipment. The facility has corn wet-milling, brewing, milk, cheese, soy foods, and fruit and vegetable processing equipment, including wet-grinders, kettles, retorts, filters, continuous centrifuges, screens and mixing tanks. Cold- and dry-storage lockers, a maintenance shop and offices for pilot-plant supervisory personnel are immediately adjacent to the plant floor.
- ✓ *Dry Processing Pilot Plant* - The 2,600-square-foot pilot plant is a dry-processing facility. It is designed for the experimental processing and scale-up of industrial milling, cooking, dry separation, drying, and extrusion systems for grain

processing, and other industrial processes. The area has a specially integrated dust collection system.

Michigan State University (ca. 26 faculty)

- ✓ *The Dairy Processing pilot plant* is equipped to process a variety of natural cheeses, cultured dairy products and ice cream in a state-of-the-art processing system. Products are offered for sale to the public and to other MSU food service outlets through the MSU Dairy Store and the MSU Union Dairy Store and the MSU Union Dairy Store. Cheese is also sold via mail order and on-line. The maintenance of a small commercial scale processing facility along with the pilot scale facilities provides an environment that is effectively used as a research, extension and teaching tool.

University of Missouri-Columbia (11 faculty, including 3 Ph.D. instructors)

- ✓ *No apparent food processing pilot plant*

University of Arizona (no food science program)

University of Minnesota-Twin Cities (20 faculty)

- ✓ *The Joseph J. Warthesen Food Processing Center (pilot plant)* is inspected by the State of Minnesota and is certified as a food production facility. The Center includes specialized equipment in the areas of dairy and cheese processing, twin-screw extrusion, aseptic/ESL processing, and various concentration operations (membrane processing, spray and fluidized-bed drying, centrifugation). The faculty and staff who operate the Center are available for consultation and assistance in development of novel processes and products, or simply for evaluation and analysis of samples or prototypes.

Ohio State University-Main Campus (25 faculty)

- ✓ *Wilber A. Gould Food Processing Center* includes two distinct pilot plants that are available for new product development and research. The pilot plants are FDA and ODA inspected, meeting safety and sanitation needs. Equipment mobility permits rearrangement to desired product flow patterns. As a result, the pilot plants can be utilized one day as a teaching and demonstration area, utilizing current processing technologies and procedures, and the next day, with minor modifications, can function as a research facility probing new concepts and procedures. Capabilities include:
 - Snack foods – extrusion, baking, mixing, and frying.
 - Dairy processing – fluid milk processing, ice cream, yogurt and cheese products, Microthermics, and CIP test unit.
 - Thermal processing – thermal studies, fruit and vegetable canning, blanching, and juice extraction.
 - Frozen foods – -10° F and -40° F freezers, blast freezing, and freeze-drying.

University of Michigan-Ann Arbor (no food science program)

University of Wisconsin-Madison (11 faculty plus 2 lecturers)

- ✓ The Department of Food Science maintains three pilot plant facilities for confectionery, fruit and vegetables and general food and dairy

University of North Carolina at Chapel Hill (23 faculty)

- ✓ University of North Carolina at Chapel Hill has seven pilot plants dedicated to the advancement of knowledge in specific commodity and general discipline areas. Schaub Hall houses pilot plants for aseptic processing and packaging, dairy products, fruits and vegetables, high viscosity/particulates, meats, seafood and visual imagery. The North Carolina State University CMAST facility located in Morehead City houses a pilot plant dedicated to seafood.

University of Florida (17 faculty)

- ✓ *Aquatic Food Pilot Plant*
- ✓ *The Citrus Fruit Processing Pilot Plant* contains most of the equipment necessary to perform studies related to citrus, beverage, and by-products processing. Included are the operations of fruit washing and sizing, state test extraction, juice extraction and finishing, centrifugation, evaporation, pasteurization and filtration. Research capabilities are available to support the studies of the scientists and for cooperative industry projects. Fresh fruit pilot plant facilities are available for degreening, packing-line treatment and storage studies of citrus and other produce. Automated equipment has been incorporated into the packing-line to size and sort fresh fruit by color, density and blemish criteria. Multiple temperature- controlled rooms are available for experiments on fresh citrus and other commodities.

Comparisons between these programs demonstrates the major limitations/needs for our FSC undergraduate program at the University of Kentucky, which are:

- With only seven FSC faculty members (1.87 FTE) to teach our IFT accredited undergraduate program and all peripheral activities, we are well below the average of 22 faculty members at our benchmark institutions that have a FSC program.
- Our food processing teaching faculties are severely lacking compared to the facilities at our benchmark institutions that have a FSC program. In the past our program has had to rely on field trips to regional food processors to make-up for this shortcoming; however, the funds to support this off-campus activity (e.g., vehicle rental) has been cut in recent years and is likely to remain insufficient.

Equine Science and Management Undergraduate Program

Overview

The multidisciplinary Equine Science and Management (EQM) undergraduate degree program is one of five multidisciplinary programs in CAFE; the others are Agricultural and Medical Biotechnology, Modern Agronomic Crop Production, Natural Resources and Environmental

Science, and Sustainable Agriculture. Although this program is not housed solely within AFS, AFS’s faculty make significant contributions to this program in terms of teaching and advising. The UK Ag Equine Programs, which includes the EQM degree, went through its own review process in Fall 2015; therefore, the comments in this section will be limited to the contributions made by AFS to the EQM undergraduate degree program.

Equine Science and Management Teaching Personnel

As it is an interdisciplinary program that is not housed in a single academic department, the EQM program relies on faculty appointed in several departments within CAFE in order to teach the major requirement and emphasis area courses. The Department of AFS is the largest contributor of faculty to the EQM program. As seen in **Table 19**, UK Ag Equine Programs has historically had a very small number of primary instructor full time equivalents, necessitating a large dependence on the faculty from other departments, especially AFS. It is noteworthy, however, that in response to participant feedback from the 2015 review of UK Ag Equine Programs, an additional two lecturer positions were created, which increased the number of instructor full time equivalents in UK Ag Equine Programs. Both new lecturers, as well as the lecturer who has been with the program since 2009, are housed academically in AFS. **Table 20** lists the contributions of AFS’s faculty to the EQM program from Fall 2011 through Spring 2017.

Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016	Fall 2016	Spring 2017
1.0	1.0	1.0	1.0	1.0	1.3	1.0	1.0	1.0	1.3	3.0	3.0

Name	Course Taught	Years
Aaron, Debra	ASC 362: Animal Breeding and Genetics ⁴	2011/12 – 2016/17
Adedokun, Sunday	ASC 378: Animal Nutrition/Feeding ^{3,4}	2014/15 – 2016/17
Bridges, Phillip	ASC 364: Reproductive Physiology of Farm Animals ^{3,4}	2011/12 – 2016/17
Camargo, Fernanda	ASC 310: Equine Anatomy ^{1,2}	2011/12 – 2015/16
	EQM 351: Equine Health and Diseases ^{1,2}	2011/12 – 2016/17
Coleman, Robert	ASC 410G: Equine Science ¹	2011/12 – 2014/15
	EQM 300: Equine Facility Design and Management ⁴	2013/14 – 2016/17
	EQM 490: Capstone in Equine Science and Management ^{1,2}	2011/12 – 2016/17
	GEN 109: Tools & Tack in the Horse Industry ⁴	2013/14 – 2015/16
	Director of Undergraduate Studies	2011/12 – 2016/17
Dwyer, Roberta	EQM 490: Capstone in Equine Science and Management ^{1,2}	2016/17
Heleski, Camie	ASC 310: Equine Anatomy ^{1,2}	2016/17
	EQM 101: Introduction to the Horse & Horse Industry ^{1,2}	2016/17
	EQM 106: Introduction to Careers in the Equine Industry ⁴	2016/17
	EQM 300: Animal Behavior ⁴	2016/17
	EQM 300: Equine Study Abroad ⁴	2016/17
	EQM 301: Thoroughbred Sales ⁴	2016/17

Table 20. Teaching and Administrative Allocations for AFS Faculty in the EQM Program (2011-17)

Name	Course Taught	Years
<i>(continued from previous page)</i>		
James, Elizabeth	EQM 101: Introduction to the Horse & Horse Industry ^{1,2}	2011/12 – 2016/17
	EQM 106: Introduction to Careers in the Equine Industry ⁴	2011/12 – 2015/16
	EQM 205: Equine Career Preparation ⁴	2011/12 – 2015/16
	EQM 301: Thoroughbred Sales ⁴	2012/13 – 2015/16
	EQM 302: Equine Event Planning ⁴	2012/13 – 2016/17
	EQM 399: Equine Science and Management Internship ^{1,2}	2011/12 – 2016/17
Lawrence, Laurie	ASC 311: Advanced Equine Conformation ⁴	2013/14 – 2016/17
	ASC 389: Applied Equine Nutrition/Feeding ⁴	2011/12 – 2016/17
	ASC 410: Equine Science ^{1,4}	2015/16 – 2016/17
Lawyer, Amy	ASC 310: Equine Anatomy ^{1,2}	2014/15 – 2016/17
Lindemann, Merlin	ASC 378: Animal Nutrition/Feeding ^{3,4}	2011/12 – 2014/15
Rossano, Mary	ASC 101: Domestic Animal Biology ^{1,2}	2011/12 – 2016/17
	ASC 320: Equine Management ^{1,2}	2011/12 – 2016/17
	EQM 105: Equine Behavior and Handling ^{1,2}	2011/12 – 2016/17
Urschel, Kristine	ASC 325: Animal Physiology ^{3,4}	2011/12 – 2016/17
	ASC 410G: Equine Science ¹	2011/12 – 2014/15
	Director of Undergraduate Studies	2016/17
Vanzant, Eric	ASC 378: Animal Nutrition/Feeding ^{3,4}	2011/12 – 2016/17
Wahrmund, Jackie	ASC 101: Domestic Animal Biology ^{1,2}	2016/17
Wilson, Kristen	GEN 109: Tools & Tack in the Horse Industry ⁴	2013/14 – 2015/16
	Academic Coordinator	2012/13 – 2016/17

¹This course was a major requirement in the curriculum prior to Fall 2014

²This course is a major requirement in the current curriculum

³This course was part of the science option in the curriculum prior to Fall 2014

⁴This course is an emphasis area course in the current curriculum

Equine Science and Management Curriculum

The EQM program became an official undergraduate degree program in 2009. Currently, the EQM degree is a 120-credit degree program, with 24-26 credits associated exclusively with UK Core Requirements and an additional 19 - 23 credits associated with pre-major requirements. The original curriculum (see **Appendix S**) had a core set of 10 major requirement courses (8 equine-specific courses, 1 animal science course and 1 agricultural economics course), and then students enrolled in either the Equine Science or Equine Management track. A new curriculum was introduced beginning in the Fall of 2014 (see **Appendix T**), which included a core set of nine major requirement courses (7 equine-specific courses, 1 animal science course and 1 agricultural economics course), and students then select courses from one or more of our four emphasis areas: Community Leadership and Development, Equine Business, Equine Science and Forage/Pasture.

Appendix U provides additional information regarding the major requirement and emphasis area courses in the EQM program that are taught by Animal and Food Sciences faculty, including the semesters offered, total enrollment and the enrollment of EQM students.

The student learning outcomes of the EQM program are as follows:

1. Students will demonstrate their knowledge of equine science and management.
2. Students will demonstrate their knowledge of local, national and/or global issues within the equine industry.
3. Students will communicate effectively through written and oral modes of communication.
4. Students will execute scientifically informed decisions by utilizing critical thinking, analytical reasoning and/or problem solving skills.

The curriculum committee for the EQM program has been actively reviewing the current curriculum: 1) to identify potential areas of overlap and omission in the core equine knowledge and skills taught to all EQM students; and, 2) to ensure better agreement between the program's core equine curriculum, the student learning outcomes, and the assessment plan. During the Spring 2017 semester, the curriculum committee met every other week to determine what knowledge and skills were being taught in each of the nine major requirement courses, and whether the concepts were introduced, reinforced or applied. The faculty instructors, a subset of our student alumni and members of our Advisory Board, were also surveyed to determine which aspects of the knowledge and skills were considered most important. Based on all of the responses received, the committee then identified knowledge and skills identified as "important" by the stakeholders that were not being taught, or only minimally taught. To date, there have also been three half-day workshops where the instructors of the core and emphasis area classes were invited to participate in curriculum mapping activities. In addition to identifying areas of omission and overlap, discussions have also focused on potential changes to the structure and content of the emphasis areas and on implementing changes to the required academic enrichment experience (currently the only option is for students to complete a 150-hour internship). The curriculum committee intends to continue meeting every other week throughout the Fall 2017 semester and it is anticipated that a curriculum revision will be submitted in the next 6 – 12 months.

Unique Aspects of the Equine Science and Management Curriculum

Comparisons to Other Benchmark Programs

The EQM undergraduate degree program is one of only three stand-alone equine degree programs at a land-grant institution in the United States. Other land-grant institutions with four-year equine degree programs are Colorado State University and University of Arizona, with the Colorado State University program being more similar to the EQM program. Several Kentucky higher education institutions offer equine-related education opportunities. These programs are identified in **Table 21**. The EQM degree at UK is different from the other programs in Kentucky because it consists of rigorous curriculum options to train tomorrow's leaders in the concepts of science, leadership and business that can be applied to the equine industry.

Table 21. Description of In-State Equine-Related Education Opportunities at Higher Education Institutions

Institution	Description	Riding Courses for Credit
University of Kentucky UK Ag Equine Programs	Major in Equine Science and Management (with emphasis areas of Community Leadership and Development, Equine Business, Equine Science and Forages/Pastures)	N
Asbury University	Major in Equine Management (Management and/or Facilitated Mental Health) from Department of Health, Physical Education, and Recreation	Y
Georgetown College Equine Scholars Program	Students choose a traditional major but participate in extracurricular equine-related activities	N
Midway University	Major in Equine Studies, with the option for concentration in Horse Management, Horse Rehabilitation or Science (also offers a minor as well as an associate's degree)	N
Morehead State University	Major in Agricultural Sciences with an area of concentration in Equine Science	Y
Murray State University	Major in Animal Science with an Equine Science/Equine Management emphasis	Y
Bluegrass Community and Technical College North American Racing Academy	Associate's degree in Equine Studies (horseman's track and jockey's track; also offers certificate and diploma options)	Y
University of Louisville Equine Business Program	Major in Equine Business (also offers a minor and a certificate)	N
Western Kentucky University	Major in Animal Science with Horse Science emphasis	Y

Hands-On Learning Opportunities

Two of the courses in the EQM program, EQM 105 (Equine Behavior and Handling) and ASC 320 (Equine Management) offer many opportunities for students to interact with horses during the laboratory component of the class. In EQM 105, students work on their basic horse handling skills (catching, leading, haltering, grooming, turn out), learn groundwork training techniques (round penning and long lining), and learn how equine behavior and learning can be assessed and incorporated into training programs. In ASC 320, hands-on activities with horses include body condition scoring, taking vital signs, basic first aid, basic farrier skills, and deworming. Other practical skills learned in ASC 320 include feed identification and selection, pasture evaluation, facility evaluation and environmental management, and performing fecal egg counts. Other classes in the EQM program with hands-on learning opportunities include ASC 101 (Domestic Animal Biology) ASC 310 (Equine Anatomy), ASC 311 (Advanced Equine Conformation), ASC 364 (Reproductive Physiology of Farm Animals), and ASC 410G (Equine Science) which all have dissection laboratories on campus. Additionally, ASC 410G has some on farm laboratory components relating to nutrition and reproduction. All students in the EQM program

are required to complete a mandatory internship, outlined in a later section, which offers students hands-on learning opportunities individually tailored to their specific interests.

Facilities

AFS provides much of the infrastructure needs for the hands-on components of the EQM degree. AFS at UK operates a 100+ acre Horse Unit for teaching and research. The horse unit is located about six miles from the UK campus on a portion of Maine Chance Farm in northern Fayette County. The FS Horse Units resides on Maine Chance Farm, which was purchased by UK in the 1960's and is currently an important part of the Kentucky Agricultural Experiment Station.

The horse unit operated by AFS and managed by Bryan Cassill includes several barns and more than 25 pastures/paddocks of various sizes. The farm routinely maintains about 100 horses, depending upon season and needs. The farm is operated by three full-time staff and a number of student workers. Highlights of AFS Horse Unit program are provided below.

1. Teaching Pavilion: The most recent addition to the farm is a large teaching pavilion that can be used for on-farm teaching activities or other events. The pavilion is currently not climate-controlled but provides a protected environment for labs and demonstrations on horse handling, management practices and conformation evaluation. Recently, a large donation was received which will enable the expansion and renovation of the Teaching Pavilion into the Pirri Equine Teaching Pavilion. Changes will include the addition of climate-controlled spaces for teaching and extension activities, and the addition of bathroom facilities.
2. Barn 3: Barn 3 was one of the original barns on Maine Chance Farm and is used for housing horses used in teaching, research, and extension activities.
3. Barn 5: This barn, also used for teaching, research, and extension, contains 10 large box stalls. The barn also includes two feed/equipment rooms, two stocks and a large laboratory/work area. This barn can be used to house mares and foals, yearlings or mature horses.
4. The Main Barn: The Main Barn area includes two separate structures. The bigger barn has seven large foaling stalls, a breeding shed, a feed room and an office. The smaller barn has four box stalls. The Main Barn area is adjacent to 12 paddocks of various sizes. Several of the paddocks have run-in sheds. The Main Barn is used for research, teaching, and extension.

Animal Resources

The core herd consists of eight to 12 mature geldings (primarily Thoroughbreds), 25-30 Thoroughbred broodmares, their foals, and one Quarter Horse stallion. UK does not operate a riding program, and all horses are maintained for research and teaching purposes. Foals produced on the farm are progeny of area stallions. Foals are sold as weanlings or yearlings through public auction or private sale and are an important source of income for recurring costs on the farm (feed, health care, maintenance, etc.), and also a valuable learning experience for the Maine Chance Farm student workers, who prepare the horses for sale under the guidance of Bryan Cassill.

Field trips

Because of UK's location in the heart of horse country, students have many unique opportunities to visit and learn at a variety of world class equine facilities. Over the last several academic years, several courses have included field trips to a wide variety of equine operations including the Kentucky Horseshoeing School (ASC 320), Keeneland (ASC 101, ASC 311), the Red Mile (ASC 311), Fasig Tipton (ASC 311), Gainesway Farm (ASC 410) WinStar Farm (ASC 410G), Rood and Riddle Equine Hospital (ASC 410G), Kentucky Equine Research (ASC 410G), and Kentucky Equine Sports Medicine and Rehabilitation Center (ASC 410G). Unfortunately, due to barriers such as growing class sizes and the cost of transporting students during the field trips, the numbers of field trips offered have declined in recent years.

Equine Science and Management Enrollment

The EQM major has experienced rapid growth since becoming an official major in 2009 and is currently one of the largest majors in CAFE, with over 300 enrolled students in each of the three previous academic years. **Table 22** shows student enrollment over the last six academic years.

Academic Year	Fall Enrollment	Spring Enrollment
2011 – 2012	222	194
2012 – 2013	243	226
2013 – 2014	266	248
2014 – 2015	315	274
2015 – 2016	330	285
2016 – 2017	308	270

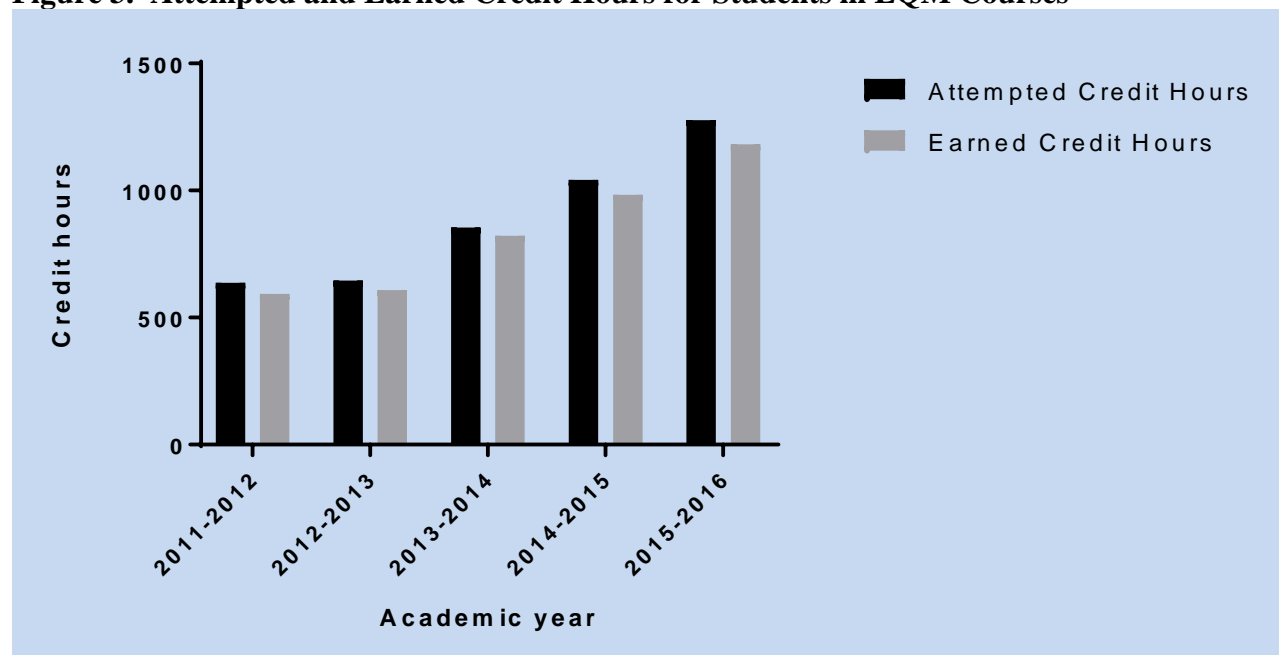
**Enrollment are numbers on the census date for each semester; includes both primary and secondary EQM majors

Additional information describing EQM students (demographics, ethnicity, average unweighted high school GPA and average ACT score of entering freshmen, reasons EQM students chose to attend UK, retention and graduation rates, degrees awarded, career placement after graduation, and internships) can be found in **Appendix V**.

Total and attempted credit hour production for the EQM courses are shown in **Figure 3**. With the exception of the 2015-2016 academic year, where two sections of EQM 300 (total enrollment of 58 students) were taught by adjunct instructors from other departments, all of the EQM courses were taught by faculty in AFS. Between 2011-2012 and 2015-2016, attempted credit hours in the EQM courses more than doubled. Students successfully completed between 92-96% of the EQM credit hours attempted.

As illustrated in **Table 22**, the EQM degree program has grown rapidly. Prospective students are frequently met at industry events where UK Ag Equine Programs has a presence, such as the Rolex Kentucky Three-Day Event and the American Quarter Horse Association's Youth World Show College Fair. Opportunities to engage excellent prospective students are pursued as resources allow. The Director of Undergraduate Studies and Academic Coordinator work closely with Wayne Centers, Director of Student Relations for CAFE, conducting more than 100 one-on-one equine prospective student visits per year. In addition, they provide program information at CAFE-hosted events for high school students/prospective students on and off campus.

Figure 3. Attempted and Earned Credit Hours for Students in EQM Courses



Equine Science and Management Advising

Prior to January 2013, all EQM students were advised from their first year to degree completion by Animal and Food Sciences faculty. The addition of an Academic Coordinator to the EQM program in January 2013 greatly enhanced the advising capacity within the program. Starting with the summer 2013 advising conferences, a new advising plan was implemented and included the following:

- All equine faculty advisors and the Academic Coordinator participate in summer advising conferences for freshmen, transfer, and readmit students as individual schedules permit.
- The Academic Coordinator is assigned all incoming freshmen to advise for the fall and spring semesters of their freshmen year. During this time, the following are completed:
 - Student file set up (to include: advising sheet – hard copy and electronic, photo, and four-year plan)
 - Four-year plan preparation and appointment
- Faculty advisors are assigned new advisees for sophomore year fall semester advising and will advise through graduation.
- Transfer, major-switch, and re-admitted students are assigned to equine faculty advisors. (Note: Students switching their major freshmen year are assigned to the Academic Coordinator.)
- Advisee numbers for each advisor are assessed each semester.

The new advising plan has been in place since Fall 2013 with the first transition of freshmen from the Academic Coordinator to faculty advisors occurring in the fall 2014 semester. To date, the revised plan is working well and has resulted in several new advising resources being developed. These new resources include: electronic advising program sheets for each emphasis

area, a four-year plan grid and list of courses including the course name, semester offered, and pre-requisites required for students to utilize during four-year planning, and a student information sheet to collect demographic and major/minor information for their student file. In addition, an Advising Syllabus that includes resources to help students better understand the advising process for our program has been created and is given to all new incoming freshmen and transfer students.

Very limited data on the effectiveness of advising and assessment of areas in which we could improve has been collected. In spring 2013, the EQM Program started collecting data through the Graduation Exit Survey sent to each student who had graduated from the program. Between Spring 2013 - 2015, 65 surveys were completed and when asked to rate the student's overall guidance they received from their advisor concerning their future and plan of study while at UK, graduates rated the advisors with an average of 4.2 out of 5 (4=very good; 5=outstanding). CAFE began administering the graduation exit surveys for all degrees in Spring 2016. Of the 32 EQM majors responding to the 2016 survey, 20 rated the quality of their advising experience as excellent, and none rated the experience poorly.

With the exception of advising in the first year, which is done by Academic Coordinator Kristen Wilson in UK Ag Equine Programs, all undergraduate advising for the EQM students is done by faculty in AFS, as shown in **Table 23**.

Table 23. AFS Faculty and Staff Advising EQM Students

Name	Fall 2012	Spring 2013	Fall 2013	Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016	Fall 2016	Spring 2017
Fernanda Camargo	23	0	17	16	27	23	31	28	23	20
Robert Coleman	87	86	81	72	74	63	65	55	34	36
Camie Heleski	---	---	---	---	---	---	---	---	30	25
Elizabeth James	31	28	25	24	28	25	28	24	17	7
Mary Rossano	71	63	65	56	54	49	57	50	50	51
Kristine Urschel	25	22	16	15	27	25	30	27	20	19
Jackie Wahrmond	---	---	---	---	---	---	---	---	30	30
Kristen Wilson	---	22	58	58	93	79	94	85	90	78

Equine Science and Management Retention and Graduation

With the EQM degree program officially beginning in Fall 2009, there is very limited available data for the 6-year graduation rates (see **Appendix V**). Students who began as freshman EQM majors in 2009 and 2010 had six-year graduation rates from UK of 65% and 56.8%, respectively. In general, retention in the EQM program has been similar or exceeded the overall retention of

students at UK. Due to the high proportion of out-of-state students in the EQM program, if students opt not to continue in the EQM program, they may be more likely to leave UK and return to their home state.

EQM advisors are continually sharing on-campus resources with students during advising appointments to help increase the success rate of our students. Through College wide efforts, the EQM program has participated in several retention improvement efforts. These have included conducting student success plans and follow up meetings with students who are considered vulnerable and are at risk of not being successful for various reasons (i.e. current GPA, a combination of background data, etc.), selecting key students to participate in a yearlong peer mentoring program as freshmen with targeted meet ups and activities, and having students on academic probation have several meetings with a Director in the Center for Student Success to outline a plan for success in the coming semester. All of these efforts have seen various degrees of success.

Assessment of the Undergraduate Equine Science and Management Program

The EQM program has a number of direct and indirect method assessment tools (**Appendix W**) that have been developed to help collect data on a student's progress through the program. These tools are used to measure the following student learning outcomes:

Learning Outcomes:

1. Students will demonstrate their knowledge of equine science and management.
2. Students will demonstrate their knowledge of local, national and/or global issues within the equine industry.
3. Students will communicate effectively through written and oral modes of communication.
4. Students will execute scientifically informed decisions by utilizing critical thinking, analytical reasoning and/or problem solving skills.

TCE Scores

Table 24 provides the TCE scores for both course quality and instruction quality for Fall 2011 through Spring 2017 for all courses with the EQM prefix. With the exception of two sections of EQM 300 in each of Fall 2015 and Fall 2016, all of the courses contributing to these values were taught by Animal and Food Sciences faculty members. With the exception of the occasional semester, the TCE scores for both quality of the course and quality of the instruction met or exceeded both CAFE and University means. It is also important to note there has been a fairly substantial decline in student response rates since we moved from the hard-copy, in class evaluation (ended Fall 2013) to the online evaluation (beginning Spring 2014) and therefore all of these numbers must be interpreted with caution.

Table 24. Teacher Course Evaluation Scores for EQM Courses

	Quality of the course			Quality of the instruction		
	EQM mean	College mean	University mean	EQM mean	College mean	University mean
Fall 2011 ^{1,3}	3.6	3.4	3.3	3.8	3.5	3.4
Spring 2012 ^{1,3}	3.8	3.4	3.3	3.8	3.5	3.4
Fall 2012 ^{1,3}	3.8	3.3	3.3	3.8	3.5	3.4
Spring 2013 ^{1,3}	3.6	2.9	3.3	3.8	3.3	3.4
Fall 2013 ^{1,3}	3.4	3.2	3.3	3.5	3.3	3.4
Spring 2014 ^{1,4}	3.75	3.31	3.27	3.54	3.39	3.35
Fall 2014 ^{1,4}	3.46	3.37	3.23	3.54	3.42	3.3
Spring 2015 ^{1,4}	3.27	3.35	3.25	3.55	3.45	3.33
Fall 2015 ^{1,4}	3.34	3.3	3.2	3.5	3.4	3.31
Spring 2016 ^{1,4}	3.49	3.35	3.23	3.64	3.48	3.34
Fall 2016 ^{2,4}	4.09	4.22	4.08	4.26	4.34	4.25
Spring 2017 ^{2,4}	4.03	4.27	4.27	4.21	4.41	4.41

¹Evaluation scores on a 1 (Poor) to 4 (Excellent) scale

²Evaluation scores on a 1 (Poor) to 5 (Excellent) scale

³Evaluations provided to students in hard-copy form during class time

⁴Evaluations provided to students online to complete on their own time

Professional Activities to Improve Instructional Efforts

AFS faculty that teach EQM courses routinely participate in professional development activities, both through opportunities at UK and through the attendance at external professional meetings. In particular, faculty teaching EQM courses have been particularly active in their attendance at the National Association of Equine Affiliated Academics (NAEAA) meetings. The following list provides the professional development activities for Animal and Food Sciences faculty and staff that teach EQM courses (or GEN courses with an equine-focus):

- Robert Coleman
 - Attendance at NAEAA meetings 2011 – 2017

- Camie Heleski
 - Attendance at NAEAA meetings 2011, 2015 and 2016
 - ✓ Presented at the 2011 meeting: “Worth their weight in gold... value of lesson horses”
 - ✓ Presented at the 2016 meeting: “Novel teaching tools- the animal welfare judging contest”
 - Center for the Enhancement of Learning and Teaching (CELT) seminars:
 - ✓ Making PowerPoint presentations more engaging
 - ✓ If you invigorate your courses, is it OK if no one fails?
 - ✓ Enhancing diversity at the university
 - ✓ Working with students who need extra assistance
 - Had a CELT representative attend her Animal Behavior (EQM 300) class to assess her teaching and then met with them to discuss feedback
 - Presenter at the 2015 Equine Science Society meeting of a workshop about how to incorporate equine learning theory into the curriculum

- Mary Rossano
 - Completed the Academy of Teaching and Learning Scholars program in the CAFE’s Center for Excellence in Teaching and Learning 2011
 - Attendance at NAEAA meetings 2011, 2013 – 2015
 - ✓ Panelist at the 2013 meeting about research in teaching
 - Attendance at the North American College of Teachers of Agriculture meeting 2011 – 2013
 - Attendance at the American Association of Veterinary Parasitologists Educators Symposium 2011-2013
 - Attendance at teaching workshops and mini-symposia at the Equine Science Society meeting in 2013, 2015 and 2017
 - ✓ Co-led a workshop on assessment at the 2017 meeting
 - Attendance at the Association for the Assessment of Learning in Higher Education meeting 2013
 - Attended a CELT workshop on student cheating in 2017
 - Participant in the eLearning Innovation Initiative (eLII) Faculty Skill Development Program (grant and training program for the development of faculty skill in blended learning) 2015 – 2016

- Kristen Wilson
 - Attendance at NAEAA meetings 2016 and 2017
 - Attendance at teaching workshops and mini-symposia at the Equine Science Society meeting in 2013 and 2017

Equine Science and Management Academic Enrichment Experience

The National Society for Experiential Learning defines an internship as a carefully monitored work or volunteer experience in which an individual has intentional learning goals and reflects actively on what he or she is learning through the experience. Simply put, an internship is on-site work experience related to a student’s career goals or field of interest that is supervised, professional, educational, and evaluated. From its inception, the EQM degree has had a

mandatory, 150-hour industry-related internship as one of its program requirements (EQM 399), which also serves as the Academic Enrichment Experience for the program. These internships may be done after the student has completed 60 credit hours of course work (junior standing) and has completed the following courses: EQM 101, EQM 105, ASC 310, and ASC 320. The goal is for students to be able to complete their internship after their sophomore year; however, due to capacity issues in many of our equine classes, students may not have completed all of the required coursework until sometime in their junior year.

Appendix V provides enrollment in EQM 399 over the last 6 academic years, a listing of internship sites, a listing of Intern of the Year recipients, and a listing of Internship Host of the Year recipients.

Equine Science and Management Clubs and Advisors

There are a number of extracurricular opportunities for students to be involved in riding teams or other horse-related opportunities. These university-approved clubs are housed in CAFE. A more detailed list of the clubs and teams is provided in **Appendix X**. Of the eight equine-focused clubs and teams, five of them are advised by faculty within AFS: Equestrian Team- IHSA Hunt Seat (faculty advisor: Dr. Bob Coleman); Equestrian Team- IHSA Western (faculty advisor- Dr. Bob Coleman); Horse Racing Club (faculty advisor: Dr. Laurie Lawrence); READ Club (faculty advisor: Kristine Urschel); and Saddle Seat Team (faculty advisor: Dr. Mary Rossano).

Equine Science and Management Student Awards and Recognition

The EQM Program has had several students recognized in a variety of ways. **Appendix V** provides the number of EQM students on the Dean's List over time, a listing of college scholarship recipients, and a listing of students who received a variety of other awards and recognitions.

Teaching and Advising Recognition of Faculty and Staff

AFS faculty and staff that teach the EQM courses and advise the EQM students have been recognized in various forms for their teaching and advising excellence:

- Fernanda Camargo
 - College of Education's Teacher Who Made a Difference Award (2017, 2015)
- Robert Coleman
 - Joe Davis Outstanding Advisor Award from Ag Student Council (2015)
- Camie Heleski
 - AVMA Non-Veterinarian Humane Award (2012) (*received while on faculty at Michigan State University)
- Elizabeth LaBonty
 - College of Education's Teacher Who Made a Difference Award (2014)
 - Nomination for Ken Freedman Outstanding Advisor Award (2015)
- Mary Rossano
 - College of Education's Teacher Who Made a Difference Award (2014)
 - Nomination for Ken Freedman Outstanding Advisor Award (2015, 2016, 2017)

- Kristine Urschel
 - Nomination for Ken Freedman Outstanding Advisor Award (2016, 2017)
- Kristen Wilson
 - Nomination for Ken Freedman Outstanding Advisor Award (2016, 2017)

Major Limitations/Challenges/Needs

The rapid growth in the multidisciplinary EQM has led to several challenges, including:

- Limitations in the available resources needed to teach students and provide them with hands-on learning opportunities and has put tremendous pressure on the resources provided (i.e. teaching manpower and facilities) provided by AFS. Although this program is not officially a part of AFS, this department has historically provided the overwhelming majority of the teaching and advising personnel and provides the facilities and horses used for teaching purposes.
- On campus there is a lack of available classrooms on the south side of UK campus that can accommodate greater than 50 students and a shortage of teaching lab facilities, where activities such as dissections can be performed.
- A major limitation at the AFS Horse Unit is that the barns and research horses are shared between the research, teaching and extension missions and, therefore, to be able to accommodate more student learning activities at the farm, this has an impact on other activities, particularly research. At this time, the farm infrastructure can really only accommodate one course at any given time of the day, which has meant that we have only taught one intensive farm-use class (EQM 105 and ASC 320) each semester. Limiting each of these classes to only one semester has created delays in students being able to get these courses at the appropriate times in their degrees. In recent years, additional sections have been added to these courses such that we can currently accommodate 90 students in EQM 105 in the Spring semester and 140 students in ASC 320 in the fall semester. (Note: Non-EQM majors also take this course and due to previous limitations there is a substantial backlog that we are attempting to remedy.) Although the renovations to the Teaching Pavilion will provide additional space that could be used for activities such as wet lab activities and dissections, the constraints of barn space, arena space and available teaching horses will remain.
- Growing class sizes have also limited our ability to take advantage of all of the equine industry resources in central Kentucky through the use of class field trips. It is difficult to accommodate the 30 or more students in each of our lab sections into a single field trip, it becomes logistically difficult to impose on the same facility multiple times in the semester to accommodate multiple smaller groups, and the cost of transporting students during the field trips is expensive. Therefore, the number of field trips offered have declined in recent years.
- Other challenges related to teaching include the need for students to provide their own transport out to the AFS Horse Unit and the lack of funding to support graduate students who could serve as dedicated teaching assistants for the EQM program. Large numbers of students also require extensive advising resources. With the addition of the Academic Coordinator (2013) and two new Lecturers (2016), this has helped to ease some of the

advising pressures. However, most of the AFS faculty advisors are near their maximum limit for advisees, especially when taking the other aspects of their academic appointment into account, so there is limited ability to accommodate any future growth in student numbers without additional AFS resources.

Pre-Veterinary Advising Program

Overview

UK has the largest pre-veterinary (PV) advising program in the Commonwealth. Kentucky does not have a veterinary school; however, legal Kentucky residents can apply for contract seats at the veterinary schools at Auburn University and Tuskegee University. Currently, Kentucky has 38 seats at Auburn and two seats at Tuskegee. KY residents pay in-state tuition at Auburn (\$20,000/year) and discounted tuition at Tuskegee (~\$24,000/year). The UK PV program advises students no matter their state of residency or degree program.

The UK PV advising program was originally housed in the Department of Veterinary Science with one faculty member acting as the advisor (Dr. Roberta Dwyer since 1989). The number of advisees has grown from 60 students in 1989 (virtually all KY residents) to 450+ currently (students from multiple states). With the advent of technology to communicate with students via email and listservs, as well as the growth of animal-related science programs at UK, the numbers of PV advisees has steadily grown.

The vast majority of PV students major in ASC or EQM. In January 2016, Dr. Dwyer and the PV advising program moved to AFS to streamline and coordinate advising procedures more effectively with professional advisors and faculty in ASC and EQM.

During Spring 2016, a search was conducted to hire an Academic Coordinator for PV advising. In September 2016, Colette Tebeau, MS was hired and is now in charge of recruiting, academic advising of all freshmen and sophomores, student communications, data collation and other duties. Dr. Dwyer is the Director of Undergraduate Studies for PV, oversees the program, advises junior and senior students and coordinates all veterinary school application information. Ms. Tebeau is the first Academic Coordinator for PV advising at UK.

Pre-Veterinary Advising

Advising activities include:

- *Recruiting*
 - ✓ Visiting with prospective high school students and parents (individually and group activities)
 - ✓ Communicating with current and prospective students via email and telephone
 - ✓ Meeting with high school teachers, community college students, community college advisors, etc.
 - ✓ Maintaining and updating websites and printed information for prospective students

- ✓ Meeting with non-traditional students returning to school to complete PV requirements
- *Retention*
 - ✓ Academic advising (one-on-one and group settings) to assist students in graduating on time with PV course requirements (**Appendix Y, Z**)
 - ✓ Providing referral services to students in need of tutoring, counseling, financial aid assistance, Ombud services, and other campus resources
 - ✓ Evaluating students' transcripts for completion of requirements to veterinary schools
 - ✓ Maintaining correct information on UK's PV website for current students
 - ✓ Communicating critical information to students via a general PV student listserv and an applicant-only listserv. This includes changes to veterinary school requirements that are time-sensitive to students' academic planning.
 - ✓ Organizing an annual meeting with Auburn's Associate Dean of Admissions for all central Kentucky PV students and advisors (~140 people from 6-7 colleges and universities)
 - ✓ Coordinating additional meetings for PV students with veterinary school admission officers from other veterinary schools (1-3 per year)
 - ✓ Updating statistics on veterinary school applicants and accepted students
 - ✓ Confirming course equivalencies for UK courses at veterinary schools of out-of-state residents (OH, TN, GA, and others) (**Appendix AA, BB**)
 - ✓ Providing current veterinary school admission statistics (GPA, GRE scores, veterinary experience hours, veterinary school costs, etc.) so students can make realistic choices for future career plans
- *Application*
 - ✓ Annual updating of veterinary school application instructions and KY residency procedures
 - ✓ Answering veterinary school application questions (individually and through a group listserv)
 - ✓ Assisting students with essays explaining non-academic issues that affected their grades
 - ✓ Troubleshooting student issues with residency and required veterinary school courses
 - ✓ Organizing and conducting mock interviews
 - ✓ Editing and providing feedback on the US veterinary school application (VMCAS)
 - ✓ Providing career counseling to students who are declined by veterinary schools
- *Veterinary Trends and Issues*
 - ✓ Provide historical perspective and data to the Kentucky Veterinary Medical Association and the Council for Postsecondary Education during state legislative budget years when veterinary contract seat funding is renewed. This includes

crisis communications with PV students and parents when KY budget proposals to cut veterinary contract seat funding occur. To date, funding has been retained for the KY veterinary contract seats, but this is a recurrent issue with state budget balancing.

- ✓ Attended the American Association of Veterinary Medical Colleges (AAVMC) meeting in July 2017 (annual meeting of veterinary school deans from US, Canada, and AVMA accredited schools), and was the only PV advisor at the meeting. Gained valuable insight into future veterinary school admission and educational trends.
- ✓ Met with veterinary school deans and senior faculty to stay current on admission requirements (AAVMC meeting-above; individual meetings with Michigan State, University of Missouri, Lincoln Memorial University, University of Georgia, Melbourne University, Royal Veterinary College (London), and Ross University 2016-2017)
- ✓ Communicate to students issues of veterinary debt and starting salaries garnered from the AAVMC and other reliable sources

While these advising responsibilities might seem straightforward, we have to interpret students' transcripts for possible admission to veterinary school programs at other schools, which is very different from evaluating transcripts for a UK degree. One advisee attended nine different undergraduate schools, and how UK accepts course credit is not equivalent to how veterinary schools accept courses.

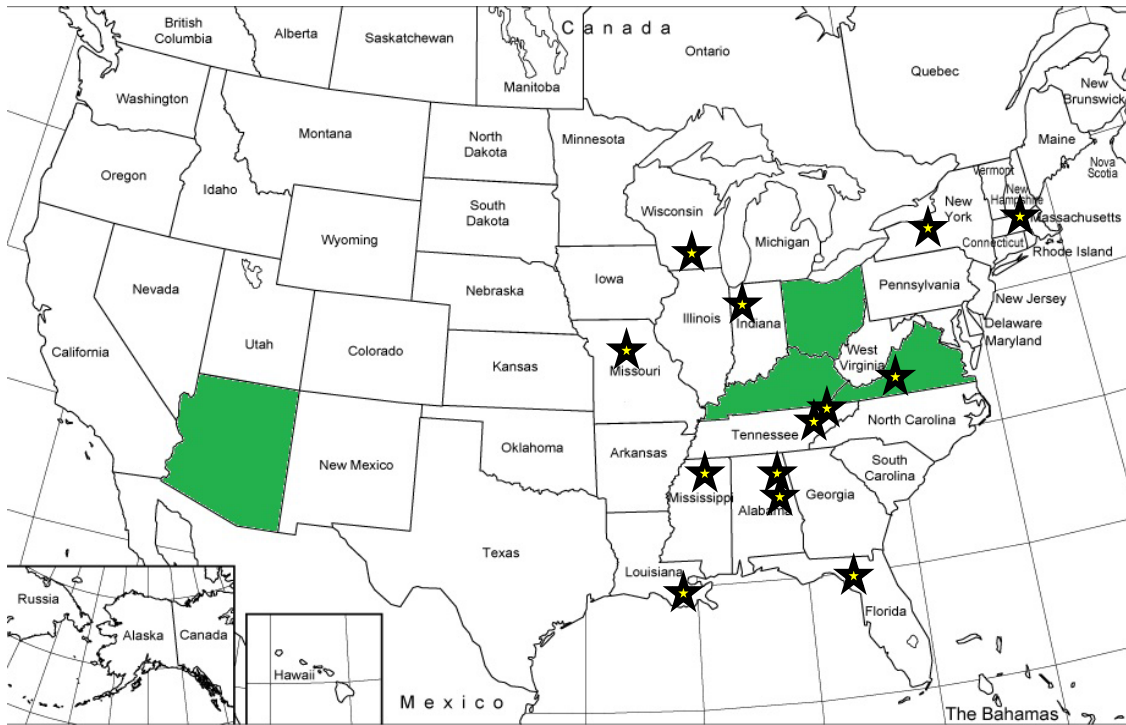
A student's state of residency should be straightforward, however one year it took 13 emails to sort out that a UK student was not a Maryland resident, but really was an Arkansas resident because his parents moved while he was earning his UK degree. This totally changed to which veterinary schools he could apply for contract seats and in-state tuition. On average, Dr. Dwyer answer 600 emails each year of veterinary school applicants alone.

Figures 4, 5, and 6 highlight the states of residency of UK advised students applying to veterinary schools, and where students were accepted. The US has 30 veterinary schools in 27 states. The average GPA of students accepted to veterinary school is 3.60. While in-state students have a 3:1 ratio of applicants to accepted students, out-of-state applicants may have 10:1 ratio of applicants to accepted students or higher. Out-of-state veterinary school tuition is \$44,000-\$70,000/year in the US, making veterinary school choices and student debt critical issues for advising.

2017 Incoming Students

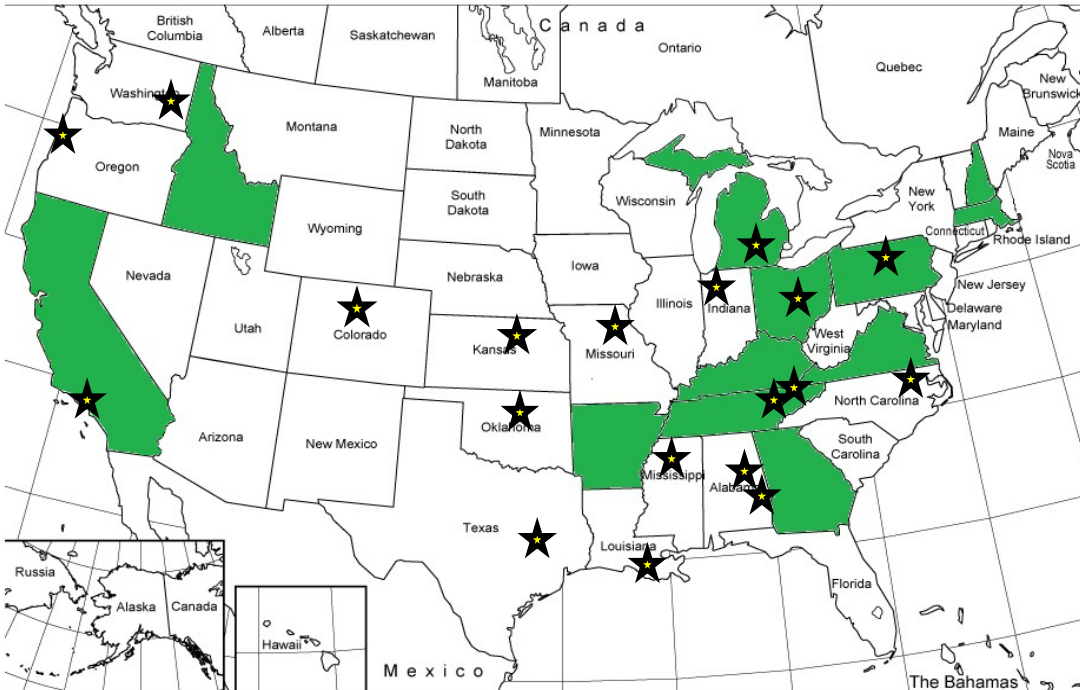
During Spring and Summer 2017 advising sessions, 113 freshmen were PV (86 ASC; 21 EQM; six Agricultural and Medical Biotechnology). Ten transfer students were PV (nine ASC, one EQM); two readmit ASC students were PV. Twenty students were degree seeking in other UK Colleges. Because UK just recently implemented a "check off" on the admissions form for PV, past numbers of students by year of admission are not possible to determine. All current UK PV students are members of the PV listserv which is regularly updated.

Figure 4. 2015 UK Pre-Vet Applicant Pool (2016 Admission)



Summary: 21 Applicants from four states (green shading); 16 students accepted (76%), one alternate, four not accepted; One student was accepted to seven veterinary schools; two students were accepted to dual DVM/PhD programs; Acceptances were from 13 US veterinary schools ★, and two international schools

Figure 5. 2016 UK Pre-Vet Applicant Pool (2017 Admission)



Summary: 31 applicants from 13 states (green shading); 21 students accepted (68%), three alternates, seven not accepted; One student was accepted to five veterinary schools; Acceptances were from 19 US veterinary schools ★.

This is a record number of incoming students to UK who are interested in veterinary medicine. Historically, a natural attrition occurs for students who change programs, are unsuccessful in rigorous chemistry and biology courses, or drop out of PV for undisclosed reasons. Annually, students transfer into UK to fulfill PV requirements either as part of a degree program, or as students who already have a Bachelor’s degree. Some students who are declined veterinary school admissions continue to take science coursework and re-apply during the next application cycle.

Figure 6. 2017 UK Pre-Vet Applicant Pool (2018 Admission)



Summary: 53 applicants from 13 states (green shading), applying to ~27 veterinary schools

Summary

The UK PV advising program has shown steady growth in the numbers of advisees over the years. UK applicants have been strongly competitive in acceptances to veterinary schools, both in-state/contract seats and out-of-state seats. This is likely due to the availability of rigorous classes, undergraduate research, and veterinary experience; coordinated academic advising resources; clubs and community service organizations that allow students to gain leadership and communication skills; and a variety of animal related experiences available in central Kentucky.

GRADUATE EDUCATION

Overview

AFS offers graduate work leading to the Master of Science (M.S.) and the Doctor of Philosophy (Ph.D.) degrees. Students pursuing M.S. degrees have two plans of work to choose from; Plan A-thesis and Plan B-non-thesis. Historically, the department has only made sporadic use of the Plan B (non-thesis) M.S. program emphasizing the research driven nature of graduate education in AFS. A graduate student handbook has been developed (**Appendix CC**) that covers general information from the application process through graduation requirements. The handbook is updated yearly and is available on the department's website.

Individual graduate programs are planned by students in consultation with their Advisor, Advisory Committee, and the Director of Graduate Studies. Study and research are available in various areas of the animal and food sciences. Animal species include beef, dairy, equine, poultry, sheep and swine. Within each species there are programs related to nutrition (all species), reproductive physiology (beef), and systems management (dairy, beef and equine). The foods area offers programs in food/lipid chemistry, food microbiology/safety, meats and protein chemistry.

Admission Requirements

In 2017, the department made several changes to the administration of our graduate program with the aim of increasing the quality and competitiveness of our graduates. One of these changes was increasing our requirements for admission to the graduate program in AFS. These changes included increasing the minimum undergraduate GPA (from 2.75 to 3.00) and adding pre-requisite courses.

Current admission requirements are as follows:

To be considered for admission to the graduate program in AFS, students must:

- Be in the process of completing, or have already completed, a 4-year degree (B.S., B.A. or equivalent) from an accredited institution of higher learning.
- Applicants for a Ph.D. program must be in the process of completing, or have already completed, an M.S. degree or equivalent.
- Have a minimum grade point average of 3.00/4.00 (where an "A" =4) in undergraduate course work and 3.0/4.0 in any graduate course work.
- International applicants must complete the TOEFL (if required; paper 550, Internet, 79; 213 computer based; IELTS 6.5).
- Must take GRE general examination — no score minimum.
- Applicants must have completed these courses:
 - Required courses: 1 semester of calculus or physics, 3 semesters of biological sciences, 3 semesters of chemistry (including 1 semester of organic chemistry or biochemistry).

- Additional courses in physiology, cell biology, microbiology, and anatomy are encouraged.
- Applicants must complete all the application forms required by the Graduate School and AFS.

In addition, all AFS admission requests are reviewed and voted on by the department's *Graduate Activities Committee* (previously it was an individual faculty decision).

Degree Requirements

M.S. Degree

The M.S. degree in AFS requires:

- Successful completion of ASC 771 (Animal Science Seminar).
- At least 24 credit hours of course work with at least 2/3 of the course work in regular classes (not special project, independent study, etc.) and at least 12 hours must be at the 600 or 700 level (excluding thesis credit).
- A minimum 3.0 grade point average for all course work.
- Successful completion of a final presentation and oral exam*.
 - * The final exam includes presentation of the thesis research and is scheduled after the thesis is complete (Plan A).
- Submission of an approved thesis** to the Graduate School.
 - ** Under unusual circumstances AFS may agree to waive the requirement for a thesis by substituting additional course work or other requirements (Plan B).

Ph.D. Degree

According to the Graduate School, the Ph.D. degree represents “documentation of independent and comprehensive scholarship in a specific field. Such scholarship must be manifested by both the student’s mastery of subject matter and capacity to do research.” During the student’s first or second semester, they should consult with their Advisor concerning the selection of an Advisory Committee (minimum of four members: Advisor is chair and one member must be outside the department). The Advisory Committee serves to assist the student in selection of courses, design of experiments, development of techniques, and preparation of the dissertation. The Advisory Committee also administers the Qualifying Exam and the Final Exam (see below).

The Ph.D. degree in AFS requires:

- An awarded master’s degree from the UK or from another accredited school may satisfy 18 of the 36-hour requirement.
- Successful completion of ASC 771 (Animal Science Seminar).
- A minimum 3.0 grade point average on all course work
- Successful completion of the Qualifying Exam*
 - *The Qualifying Exam determines that the student has sufficient mastery of the subject matter in their field. The Qualifying Exam is usually scheduled after the second year of a student’s program. The format of the Qualifying Exam is determined by the Advisory Committee and may have written and oral components.

- Successful completion and defense of the Ph.D. dissertation in the Final Exam**
 **The Final Exam includes defense of the dissertation and any other components determined to be appropriate by the Advisory Committee.
- Submission of the approved dissertation to the Graduate School

Other detailed information on the graduate program at UK can be found in **Appendix DD**.

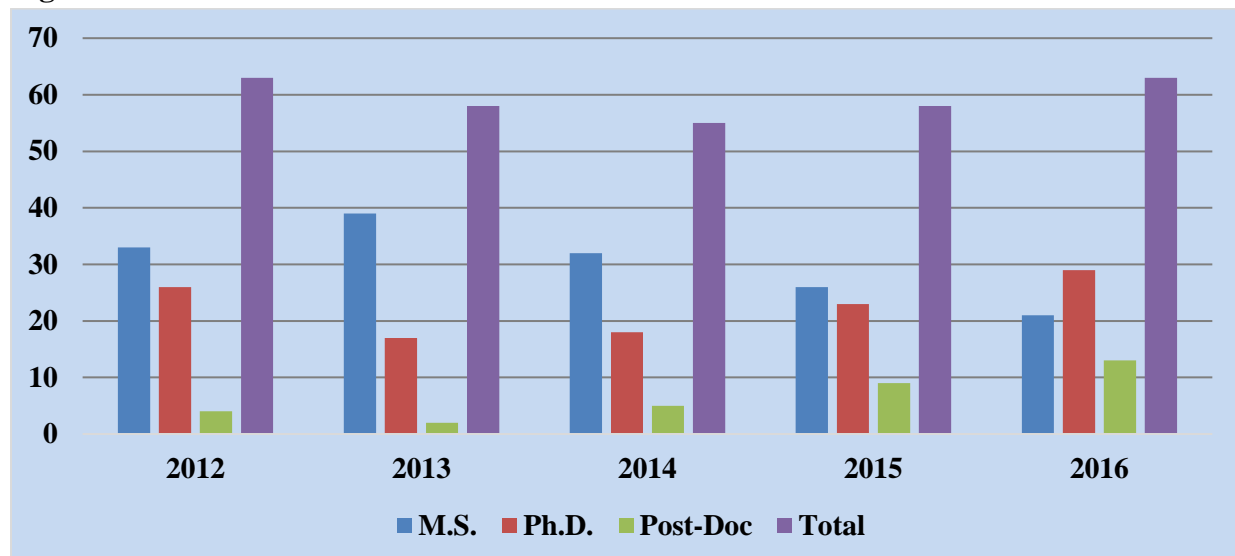
Departmental Facilities

A variety computer and laboratory facilities (although they are quite dated) are available to support graduate student research projects in AFS. A broad array of equipment is available to complement studies in nutrition, physiology and molecular biology. The University has an advanced genomics technology center and proteomics and micro-array facilities that are available for use. In addition, faculty and students at the University have access to multiple research farms for animal studies, along with intensive animal facilities on campus in the basement of the W.P. Garrigus building and at the C. Oran Little Research Center in Woodford County and Maine Chance Farm in Fayette County.

Graduate Student Enrollment and Support

The AFS graduate program at UK has long been a strength of the department. For the past five years (2012-2016) the department has averaged 59 total students (**Figure 7**) comprised of an average of 30 M.S., 23 Ph.D. and seven Post-Doctoral Scholars. Typically, approximately 40 of these students receive some type of assistantship support comprised of combinations of departmental (departmental \$7,000 assistantships with the exception of new faculty and two Teaching Assistant lines) and grant funds. Currently our M.S. students receive an average assistantship of \$14,279 (range \$10,000 – \$20,000) while Ph.D. students average \$19,689 (range \$14,000 - \$40,000). All supported students also receive full tuition and health insurance (these are paid by faculty). Students are required to pay fees (charges for recreation center, health clinic, IT, etc.) of approximately \$650 per semester.

Figure 7. Graduate Students Enrolled for Academic Years 2012-16.

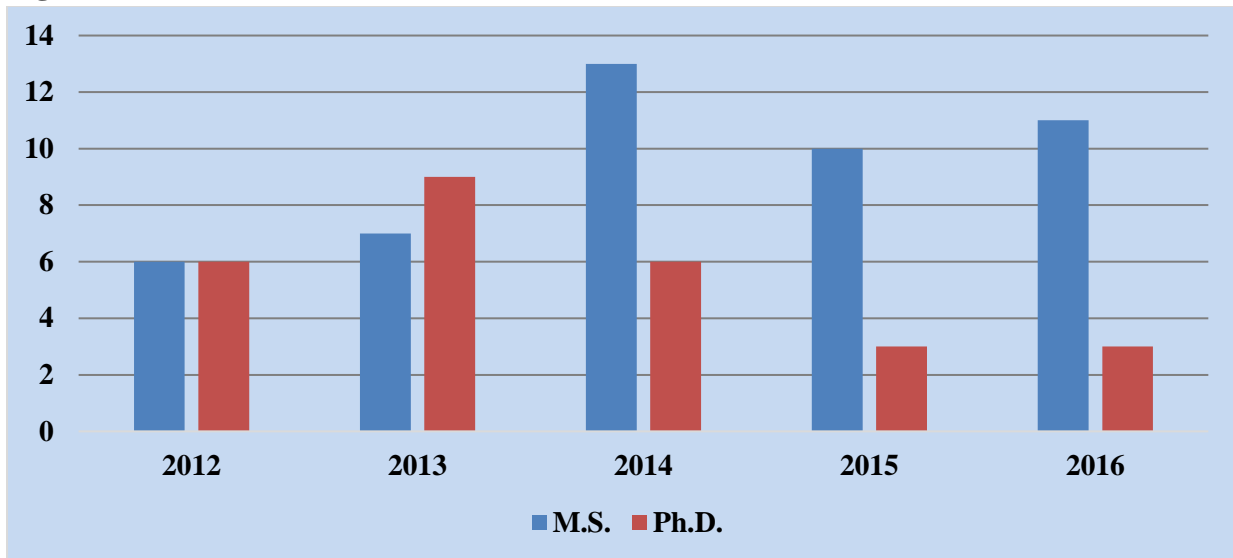


Historically, the department has received two allocated fellowships from the graduate school that were awarded within the department based on academic merit, and AFS has averaged an additional 2-3 fellowships (competitive academic fellowships and minority) from the graduate school per year. Starting in Fall 2017 these funds will be distributed directly to the department and the majority will be used to offset faculty charges for tuition (this was decided by faculty).

Graduate Students Completed

During the past five years (2012-16), the department has averaged nine M.S. and six Ph.D. student graduations per year (**Figure 8**; 47 and 27 total for M.S. and Ph.D., respectively). This compares to averages of six M.S. and three Ph.D. over the previous five years in the department.

Figure 8. Number of Annual M.S. and Ph.D. Graduates for AFS (2012-16)



Graduate Education Assessment

During the past 6 years, the department has been collecting assessment data and reporting annually as part of the University's accreditation program. To accomplish this task, assessment forms were developed for M.S. and Ph.D. students and each student is assessed following the Final Exam for their degree. This exam includes a public presentation of their research followed by a closed oral exam with their Advisory Committee. The full committee then completes assessment forms for each student (Scale is as follows: 4=Excellent, 3=Good, 2=Fair and 1=Poor) and this data is recorded. A summary of this data is presented in **Figures 9 and 10**. The goal is to achieve scores of a 3 or greater and, with one exception, our graduate program has met this goal.

Figure 9. AFS Assessment Summary for M.S. Students for 2012-16 (Mean \pm SEM, n=10, 8, 10, 9, 10 for 2012-16)

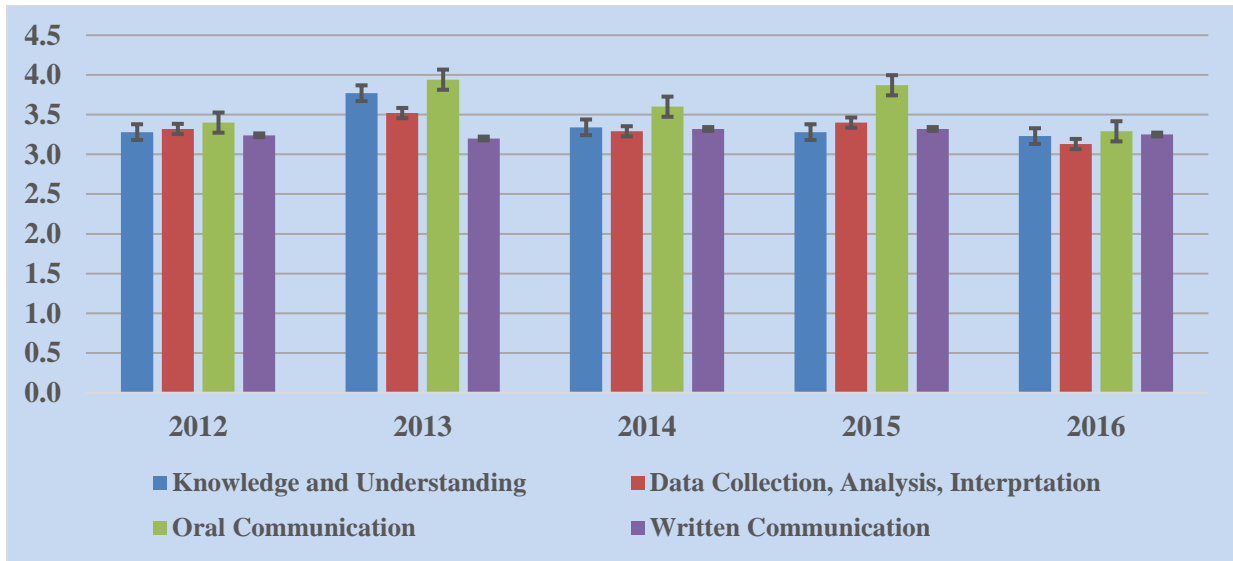
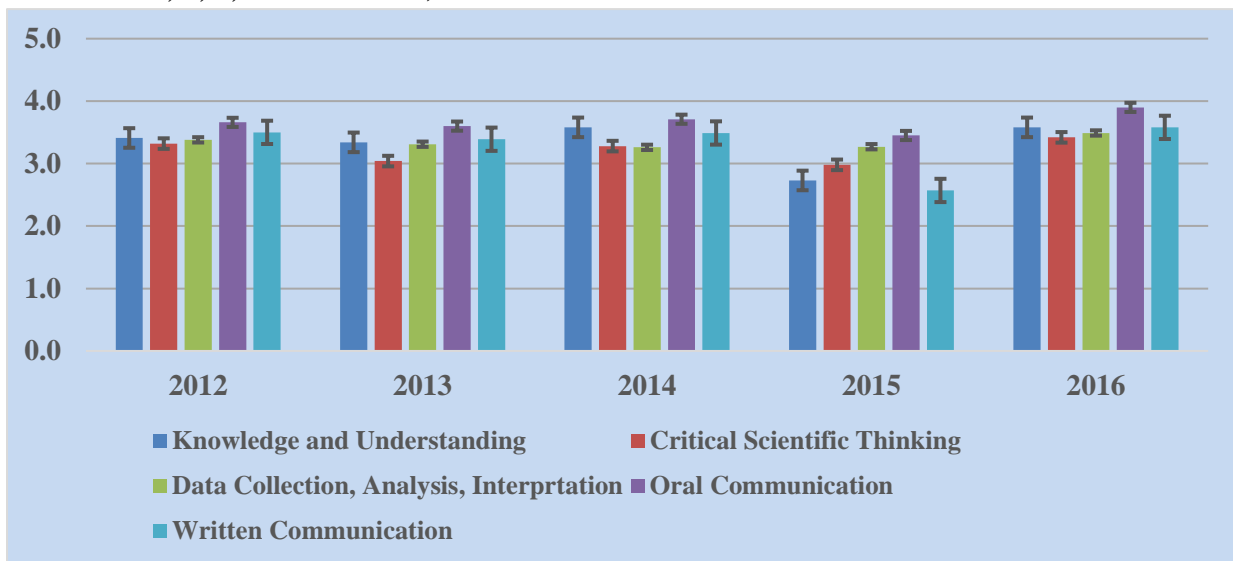


Figure 10. AFS Assessment Summary for Ph.D. Students for 2012-16 (Mean \pm SEM, n=10, 6, 4, 2, 4 for 2012-16)



Major Limitations/Challenges/Needs

AFS at UK has a long history of excellence in graduate education. It has been both a focus and a strength of the department. Our challenges are no different from those for other land-grant institutions, and include:

- Funding to support graduate student stipends and tuition, is a continual challenge. Tuition costs for graduate students have doubled since 2005, and with additional increases anticipated, sustainability seems unlikely.

- Our laboratory infrastructure is 50 years old and greatly in need of updating.
- Costs of animal research and expenses associated with maintaining our research farms is a growing concern.
- Despite decreased research FTE in the department and the increased costs associated with graduate support, the department has maintained approximately 50-60 graduate students for many years. The decision by the university that all graduate students receiving a stipend also will receive paid tuition and health insurance, and these costs will be paid by faculty, has made it challenging to maintain support in light of the escalating costs for both.
- A major factor contributing to our success in maintaining graduate student numbers is that our department provides 21, \$7000 stipends that are available to research faculty as partial support for graduate students (as opposed to fully funding perhaps 7-10 students). This model has helped maintain increased numbers of students. With the recent change in funding model whereby the graduate school will provide block funding to CAFE directly, the department has agreed to use this support almost entirely to reduce the tuition burden. Despite the never-ending escalation in tuition costs, these aspects have aided in maintaining opportunities for graduate students. In addition, under the current funding model we have seen a steep rise in post-doctoral positions as the cost is comparable to a Ph.D. student's stipend plus tuition and health insurance. The recent decision by university administration to provide a minimum of \$48,000 per year for post-doctoral positions may slow this rise.
- One of the challenges of funding graduate students has been the strict accounting standards applied to all sources of funding providing little or no flexibility in managing research programs. Greater flexibility in using multiple sources of funding would greatly aid the process of paying stipends, tuition and health insurance, particularly when the sources of funding are not federal and have greater flexibility.
- One of the long-term concerns for the sustainability of graduate education in AFS and CAFE is in regards to the M.S. program. The department has a long history of a very strong M.S. program and many students use this as their terminal degree and go on to very successful careers. The challenge is that much of our campus community has abandoned the M.S. program and views these as unimportant to graduate education. It is important that CAFE continue to support the M.S. program and recognize it as a valuable component of graduate education.

RESEARCH PROGRAM

Overview

Animal agriculture and food technology continue to evolve in the domestic as well as the global markets as the expectations of producers, processors, and consumers change. Issues such as the impact of animal production on the environment and economy, human nutrition, animal welfare, and food quality and safety have become more prominent today than ever, which offers both

challenges and opportunities for scientific researchers. The land-grant mission of AFS at UK encourages truly creative research endeavors that address state and national needs.

Disciplines of research in AFS include human, ruminant, non-ruminant, and equine nutrition; nutritional and anaerobic microbiology; physiology and reproduction; genetics and animal breeding; animal behavior; systems management, animal health economics, and food science. The University' Superfund Research Center (funded by NIH), led by an AFS faculty member (Bernhard Hennig), conducts biomedical and environmental research with the goal of minimizing the negative health and environmental impacts of organic chemicals found in hazardous waste sites. AFS faculty and professional staff are involved in collaborative efforts with other scientists in CAFE and other colleges within UK as well as with investigators from other research facilities across the U.S. and the world, for example, the USDA ARS. These collaborative efforts allow research to develop solutions to complex problems.

AFS's research activities in the past five years have focused on acquiring fundamental knowledge and discoveries related to animal biology and management, animal and human nutrition, and processing of food products to ensure quality, safety, and security. The animal science research involves both food animals (bovine, porcine, ovine, and avian) and non-food animals (equine and small companion animals). Emphases are placed on multidisciplinary and system-based research. Notably, in spite of the overall reduction of 2.6 research FTE (full time equivalent) from the previous review cycle (2005-2010), the department's comprehensive research program remains nationally competitive and productive. This is evidenced by the \$26.2 M extramural grants (as PI) received, 262 peer-reviewed journal articles published, and 75 Ph.D. and M.S. students completed over the past five years. These output figures have surpassed those recorded from the previous five years despite the FTE reduction and severe constraints of the research facilities (infrastructure deterioration, lab space limitation, and research equipment aging). In addition, 11 research faculty members have received a total of 27 major awards, including national and international awards and prizes. These accomplishments place the AFS research amongst the top research programs in CAFE in both productivity and quality.

Research Personnel

AFS currently has 37 faculty members on payroll, of which 22 have a research appointment with DOE ranging from 0.2 to 1.0 (1 full appointment = 1.0) to give a total research FTE of 12.3 in 2017 (**Table 25**). The five-year (2011-2016) average research FTE for AFS is 14.02 (compared to 15.63 for 2005-2010); per faculty member holding a research component, the average FTE is 0.65 (**Table 26**). During this period, AFS has gone through some major program and personnel changes. The retirements of five faculty members – Gary Cromwell (0.93 FTE), Robert Harmon (0.44 FTE), Clair Hicks (0.60 FTE), Austin Cantor (0.59 FTE), and James Boling (1.00 FTE), plus the passing of William Silvia (0.41 FTE), have resulted in a combined vacancy of 3.56 FTE. In addition, there have been program changes of several other research faculty members to reduce their research load. Four assistant professors have filled these vacancies – Phillip Bridges (0.77 FTE), Sunday Adedokun (0.83 FTE), Joao Costa (0.70 FTE), and Rachel Schendel (0.70 FTE), for a combined 3.00 FTE. A Research Assistant Professor position (Mieke Holder at 1.00 FTE), that is exclusively funded by Alltech Inc., was also created. In all, we saw a net reduction of 1.61 research FTE during 2011-2016 over the previous five years (2005-2010).

Category	Garrigus Bldg.	Animal Units	Total
Research faculty (FTE)	12.3	0	12.3
Faculty total:	12.3	0	12.3
Research staff			
• Research specialist	1	6	7
• Research facility manager	1	1	2
• Animal resource manager	0	1	1
• Animal care coordinator	1	4	5
• Ag service manager	0	1	1
• Research analyst principal	1	0	1
• Research analyst	5	0	5
• Lab technician senior	8	1	9
• Research farm technician	0	9	9
• Computer support specialist	2	0	2
Research staff total:	19	23	42
Postdoctoral researcher & graduate student			
• Postdoctoral researcher	7	0	7
• PhD student	20	0	20
• MS student	26	0	26
Graduate & postdoc total:	53	0	53
Visiting scholar	10		10

Items	2011-12	2012-13	2013-14	2014-15	2015-16	Total 2011-16	2016-17
Research FTE	15.3	13.4	13.7	13.6	14.1	Ave: 14.02	12.3
Awards as PI	\$3,795,412	\$2,210,226	\$3,942,738	\$3,953,800	\$4,049,193	\$17,951,369	N/A
Awards as Co-PI	\$1,562,591	\$1,667,703	\$521,381	\$2,140,140	\$2,403,009	\$8,294,824	N/A
Total awards	\$5,358,003	\$3,877,929	\$4,464,119	\$6,093,940	\$6,452,202	\$26,246,193	N/A
% Federal competitive (PI)	76.7%	27.5%	67.9%	66.0%	62.1%	Ave: 60.0%	N/A
Awards per research FTE (PI)	\$248,006	\$164,942	\$287,791	\$290,721	\$287,177	Ave: \$255,727	N/A
Total PI awards college rank	2 nd	4 th	1 st	1 st	1 st	-	N/A

^aAppendix EE provides a complete listing grants received by AFS for the review period.

Research technical support positions (currently 42, covering both the main campus and the animal farm units) remain about the same as the last review period (**Table 25**). The number of graduate students and postdoctoral associates also remain relatively constant compared to the last review period (**Table 25**). These non-faculty researchers have played a critical role in the overall productivity of the departmental research program.

Research Emphases

Research by Disciplines

Research in AFS in the past five years has focused on two main areas: (a) the elucidation of fundamental mechanisms that regulate the growth, development, nutrition, and health of animals and (2) molecular and biological interactions that control the quality and safety of food products. One of the main thrusts of the research is to integrate animal nutrition studies into different aspects of the end products – food quality and safety and human nutrition/health. The animal science research falls into three main disciplines: nutrition, physiology, and genetics, while the food science research is comprised of two main aspects: food quality and food safety. In addition, we have a growing program in animal systems (primarily dairy and equine). Many of the research activities are collaborative and cross different disciplines from both within the department and outside the department, college, and university.

A core program that interfaces animal *nutrition* and *physiology* (including reproduction), which cuts across all animal species (bovine, porcine, ovine, avian, and equine), utilizes nutrigenomics, metabolomics, and proteomics as robust tools to study nutrient metabolism and transport in various parts of the animal body and how animal physiology is affected by different production factors. Some parts of the animal science research are integrated into food science research with the results being applied to the understanding of the impact of production factors on the quality and nutrition of meat, dairy, and egg products. Strong industry alliances, particularly with Alltech through the Alltech-UK Animal Nutrigenomics Alliance and the Alltech-UK Animal Nutrition Alliance, have proven to be extremely fruitful. There are extensive collaborations between AFS researchers and those located in other departments, for example, Plant and Soil Sciences, Forestry, Biosystems and Agricultural Engineering, and Electrical Engineering. Another active collaboration exists between researchers in the department and scientists in the USDA-ARS Forage Animal Production Research Unit. These efforts focus on optimizing the forage-animal interface to enhance the animal production in forage-based enterprises. These collaborations are reflected in the joint projects where AFS researchers serve as PIs or Co-PIs. As the primary constituent of the departmental overall farm-to-table research initiative and a core program, **Food Science** research plays a critical role in generating scientific results to help value-added food processing businesses in the Commonwealth as well as serves to validate animal nutrition, physiology, and genetics research. In the past five years, the food science research has emphasized both basic and applied approaches to the investigation of physical, chemical, and biological mechanisms that control the quality, nutrition, and safety of fresh and processed foods. Particular emphases have been placed on oxidation and anti-oxidation as related to the color of fresh meat and protein functionality in processed muscle foods; impacts of feed nutrients on palatability of beef, pork, and chicken; use of natural antimicrobials to mitigate pathogens and other biological threats in food; engineering endeavors to predict milk protein coagulation in cheese making and phage control; identifying radical-mediated pathways for off-flavor generation in soy food products; and nutrient intervention for the protection of endothelial tissues

of humans. The unique structure of the AFS provides the opportunity to carry out some of the human nutrition studies using animal models, organs, and tissues.

The Food System Innovation Center (FSIC) continues to evolve and is strongly supported by extramural funds, including the Southern Regional Center of the FDA as part of the Food Safety Modernization Act (on-going), and the Kentucky Agricultural Development Board through the Kentucky Governor's Office of Agriculture Policy (support ended in 2014). The FSIC brings together researchers and extension specialists in CAFE and university, including faculty from food science, nutrition, animal science, agricultural economics, and marketing. The center serves as a platform to promote interactions with the food industry through extension, teaching, and applied research and addresses current issues on processing, safety and economy of both animal- and plant-derived foods.

Specific Research Units

The NIH-funded **Superfund Research Center** conducts biomedical and environmental research that targets the mitigation of negative health and environmental impacts of organic chemicals found in hazardous waste sites. The **meat and food science** research emphasizes biochemical, chemical and microbiological mechanisms that regulate the quality and safety of meat and legume products (color, flavor, texture, shelf-life, etc.) where both production and processing factors are investigated. For animal science research, while a disciplinary approach can be conducive to the scientific exploration of animal nutrition and health, some unique aspects of each animal species entail commodity-based approaches. Hence, the animal nutrition studies in AFS are sub-divided into ruminant and non-ruminant species. Ruminant research encompasses beef cattle, dairy cows and sheep, and non-ruminant research includes swine, poultry, and horses. **Beef cattle** research emphasizes identifying relationships between nutrient digestion, gut metabolism, and nutrient absorption, and the molecular mechanisms regulating these processes. Utilization of forages and sustainable grazing practices are also a focus of this program. The impact of management strategies on health and economics of production and quality of the final product (beef) is also included. **Dairy** research emphasizes the use of technology for monitoring dairy cattle behavior and physiology and refinement of housing systems toward improved animal health and well-being. Dairy cattle research also incorporates whole system modeling with a particular focus on animal health economics. With the addition of Dr. Joao Costa, research will be expanded into feeding behavior and nutrition of dairy calves and heifers. **Swine** research addresses dietary factors (macro and micronutrients, antibiotics, enzymes) and genetics as related to growth and development, diet digestibility, feed efficiency, immunocompetence, and quality (e.g., carcass leanness, color scores and stability) of pork, as well as prenatal and early postnatal development. **Poultry** research seeks to understand the impact of feed ingredients on growth and production, yields, and product (meat) chemical composition. Examples of feed ingredients are dried distillers grains and solubles, pearl millet, organic minerals (selenium), and enzymes. Much of the work is conducted at the Coldstream Poultry Farm, a part of the Alltech-UK Animal Nutrition Alliance. **Sheep** research emphasizes the basic principles of diet utilization for maintenance, reproduction, lactation, and growth functions. Dietary variations in concentrate to roughage ratios, in combination with feed additives, alternative feed sources, and processing methods, are evaluated for support of productive animal functions. In addition, performance parameters have been evaluated in studies to grade-up to hair sheep genetics in a low-input production system. **Equine** research emphasizes nutrient requirements of broodmares, foals,

exercising horses, as well as aging horses, digestive physiology, pasture and forage utilization, and nutrient metabolism (amino acids, proteins, micronutrients, etc.).

Research Facilities and Equipment

Laboratory Space in W.P. Garrigus Building

The AFS department has 28 lab spaces in the W.P. Garrigus Building, which include regular labs and small, storage or preparatory rooms (**Appendix FF**). These labs are located on second, fourth, sixth, and eighth floors (note: odd-number floors except the ninth floor are for non-AFS personnel). Currently, the lab spaces are distributed mostly by commodity or animal species. There have been suggestions to re-distribute research faculty by discipline. Nonetheless, the current physical structure, perceived to be not optimally efficient, does not seem to have a major negative impact on the collaboration between PIs. However, the spaces are outdated and there are frequent problems with plumbing, fume hood function and temperature control that impair efficient daily activities. In addition, there is inadequate office space for technical staff and graduate students, which limits the number of graduate students that some programs can accommodate. Approximately 2 years ago (2015) CAFE completed an inventory and review of laboratory spaces, and the spaces in the Garrigus building used by our department were rated near the bottom of the list in terms of quality even though they were rated at the top in terms of use (**Appendix GG**).

The Sensory Evaluation Lab located on the second floor continues to provide critical support for research on food science and animal science (beef, swine and poultry units) and the FSIC. This lab has been renovated with the replacement of the old table surface by new granite tiles. The taste panel room has also been renovated.

In addition, the basement contains a USDA-certified Meat Lab and a general Food Processing Pilot Plant. Although far from being modernized, the Meat Lab has both the slaughter facilities and meat processing facilities required for carrying out fresh and processed meat research. Unfortunately, the Food Processing Pilot Plant is even less equipped and only has a limited number of common processing equipment, most of which are outdated. Both basement labs are also used for teaching purposes and for the preparation of fresh and processed meats sold through the “Butcher’s Shop” that generates funds to help maintain the facilities.

Major Research Equipment

Appendix HH lists the major equipment items used by different labs and research programs of AFS within the Garrigus Building. Research instruments are not centrally located; they are typically housed in the individual PIs’ labs or in a room where multiple researchers work together. Most of the equipment tends to be old (>10 years).

Farm Facilities

AFS has four animal farms: 1) the *C. Oran Little Animal Research Center* for beef cattle, sheep, and swine research, 2) the *Maine Chance Research Farm* for equine research, 3) the *UK Research and Education Center* facility in Princeton for beef cattle research, and 4) the *Coldstream Farm* for dairy and poultry research. The Eden Shale Research Farm (located in

Owen County) was previously available for beef cattle research, but is now managed by the Kentucky Cattlemen's Association.

The *C. Oran Little Animal Research Center* at Woodford County includes research facilities for beef cattle, swine, and sheep. It is also the site for the study of newly born and young dairy calves. The Center also serves UK teaching and extension in agriculture. The Center is a primary place to conduct collaborative forage research with USDA ARS FAPRU. The *Coldstream Farm* currently houses the animal experiment units for poultry and dairy. The Poultry Unit is a joint facility of the Alltech-UK Animal Nutrition Alliance. The Dairy Unit at the Coldstream Farm houses approximately 130 cows, and the barn is designed and constructed to meet the challenge for waste management and runoff water quality control. The *UK Research and Education Center* facility in Princeton, with an approximately 120 head beef cattle herd, is a major facility for bovine nutritional physiology and reproduction studies. The *Maine Chance Farm* is used by the equine research unit in the AFS where it accommodates the research of several equine science faculty, collaborative research with faculty in Plant and Soil Sciences, and a variety of undergraduate teaching and extension activities. The increased use of the Horse Unit for undergraduate instruction has negatively impacted research activities due to competition for space. In addition, there is no temperature-controlled research space, which limits the conduct of many studies during the winter months. An additional paddock and barn area could be renovated to provide additional research space, but funds are needed to accomplish the renovation.

UK Core facilities

In addition to the research equipment and facilities existing in W.P. Garrigus Building and the several animal research farms, campus-wide facilities are available and accessible by AFS researchers. The university has established several core facilities and centers to support the research in different disciplines. These facilities are available to all UK researchers and may or may not require a user fee. Listed below are selected facilities that may be relevant to animal and food science research, and some have already been used by PIs from AFS in the past.

- Center for Clinical and Translational Sciences (CCTS)
- Division of Laboratory Animal Resources (DLAR)
- Flow Cytometry Core Facility
- Imaging Facility
- Magnetic Resonance Imaging and Spectroscopy Center (MRISC)
- Mass Spectrometry Facility
- Microarray Core Facility
- Proteomics Core Facility
- Advanced Genetic Technologies Center
- Animal Genetic Testing & Research Laboratory
- Electron Microscopy Center
- Nuclear Magnetic Resonance Facility
- X-Ray Diffraction Facility

Hatch and Multistate Projects

The following is a current listing of Hatch and Multistate for faculty in AFS:

- Construction of Active Protein Membranes for the Formation of Functional Oil-in-Water Food Emulsions—Xiong, Y.
- Development of Methodology for the Analyses of Intrinsic Free Radicals in Foods—Boatwright, W.
- Effects of Selenium Forms in Free-Choice Mineral-Vitamin Mixes on Genes, Proteins, and Metabolites of Beef Cattle Consuming Endophyte-infected Tall Fescue—Matthews, J.C.
- Enhancing the Competitiveness and Value of U.S. Beef—Suman, S.
- Enteric Diseases of Food Animals: Enhanced Prevention, Control and Food Safety—Newman, M.
- Environmental Pollutants, Nutrition and Vascular Endothelial Cell Function—Hennig, B.
- Factors Affecting Phosphorus Concentrations and Phosphorus Digestibility in Pasture Herbage Consumed by Grazing Animals—Lawrence, L.
- Integrated Approach to Enhance Efficiency of Feed Utilization in Beef Production Systems—Matthews, J.C.
- Limitations in Small Intestinal Carbohydrate Assimilation in Beef Cattle—Harmon, D.
- Management Systems to Improve the Economic and Environmental Sustainability of Dairy Enterprises (NC-2042)—Bewley, J.
- Mastitis Resistance to Enhance Dairy Food Safety—Bewley, J.M.
- Metabolic Relationships in Supply of Nutrients for Lactating Cows—McLeod, K.R.
- Methods to Increase Reproductive Efficiency in Cattle—Silvia, W.J.
- National Animal Nutrition Program—Cromwell, G.L.
- Nutritional Systems for Swine to Increase Reproductive Efficiency—Lindemann, M.
- Ovarian Influences on Embryonic Survival in Ruminants—Bridges, P.J.
- Poultry Production Systems and Well-being: Sustainability for Tomorrow—Adedokun, S.
- Rapid Assay Probe Technologies and Media for Monitoring Flora in Foodstuffs—Hicks, C.L.
- Regulating the Signaling Pathways that Determine Skeletal Muscle Mass—Urschel, K.
- Species-specificity in Carboxymyoglobin Redox Stability—Suman, S.P.
- Use of a Carbohydrate-based Toxin Adsorbent Supplement Provided through a Mineral Carrier to Alleviate Endophyte Toxicosis in Beef Cows and Calves Grazing Tall Fescue—Ely, D.

Research Productivity Measures

Research Funding

Research in AFS has consistently been well funded by extramural sources. A total of \$18.0 M as PI or \$26.2 M as PI and Co-PI combined grants were received during 2011-16, placing the AFS in 1st or 2nd place (out of 14 departments) in CAFE in four of the five years. Grant awards averaged \$255,727 (PI) per research FTE per year (**Table 26**) in the past 5 years, which is also among the leaders in CAFE in that category. A large percentage (>60.0%) of the funds received are from highly competitive federal sources, including National Institutes of Health (NIH), USDA National Institute of Food and Agriculture (NIFA), and National Institute of Hometown Security (NIHS). This sustained level of successes is a clear indication of national competitiveness and high quality of our AFS research program.

Research Publications

During 2011-16, AFS research has produced a total of 252 research publications in peer-reviewed scientific journals and books with an average of 50 papers per annum (**Table 27**). Of particular notice is the rise in the total number of journal publications despite the reduction of research faculty FTE by 1.72 in the past few years. From 2011 to 2016, the total number of refereed papers per research FTE has risen from 3.14 to 3.87. The great majority of these AFS papers are published in top-tier journals in Animal Science, Nutritional Science, and Food Science. Research faculty have also contributed nearly five book chapters every year.

Items	2011-12	2012-13	2013-14	2014-15	2015-16	Total 2011-16	2016-17
Research FTE	15.3	13.4	13.7	13.6	14.1	Ave: 14.02	12.3
¹ Total journal articles	46	45	51	54	56	252	N/A
¹ Book chapters	2	3	4	8	1	18	N/A
Total pub per research FTE	3.14	3.58	4.01	4.56	4.04	Ave: 3.87	N/A
Patents	0	0	0	1	0	1	N/A
Genbank	0	1	1	4	1	7	N/A
Ph.D.	10	8	10	1	4	33	N/A
M.S.	6	4	10	10	12	42	N/A

^a**Appendix II** provides a complete listing of research publications for AFS (taken from the Kentucky Agricultural Experiment Station Annual Report for each year of the review period).

Graduate Student Training

During 2011-16, AFS graduated a total of 42 M.S. and 33 Ph.D. students, a remarkable increase from the previous five years (2005-2010) when 34 M.S. and 13 Ph.D. students were completed.

In addition, about five postdoctoral researchers were trained each year. An estimated 30 international visiting scholars have visited our department to conduct short or long-term collaborative research or receive training, indicating international recognition and strength of the AFS research program.

See the Graduate Education section for a more complete description of graduate student training.

Research Faculty and Staff Awards and Recognitions

As an indication of the quality and productivity of research, during 2011-16, 11 research faculty in AFS have received a combined 27 major awards for their respective research. These awards, listed below, include college, university, regional, national, and international level awards. Please note that these are research-related awards only and do not include teaching and extension awards. Teaching, extension and service awards are included in other sections of this document.

- 3 elected Fellow of American Society of Animal Science (David Harmon, Laurie Lawrence, Merlin Lindeman)
- 1 elected Fellow of International Academy of Food Science and Technology (Youling Xiong)
- 1 elected Fellow of American Chemical Society Ag and Food Chem Div (Youling Xiong)
- 1 Early Achievement Award, Poultry Science Association (Sunday Adedokun)
- 1 Young Scientist Award, American Society of Animal Science (Jeffrey Bewley)
- 1 Multi-year NIEHS/NIH P42 Award (Superfund Research) (Bernhard Hennig)
- 1 University Research Professor (Bernhard Hennig)
- 3 Thomas Poe Cooper Research Award, CAFE (Bernhard Hennig, Jamie Matthews, Kyle McLeod)
- 3 George Mitchell Award for Outstanding Service to Graduate Students, Gamma Sigma Delta (Youling Xiong, Jamie Matthews, Laurie Lawrence)
- 1 Equine Nutrition Research Award, American Feed Industry Association (Laurie Lawrence)
- 1 Provost's Distinguished Service Professor, UK (Laurie Lawrence)
- 1 Cromwell Award in Mineral Nutrition, American Society of Animal Science (Merlin Lindeman)
- 1 Master of the Pork Industry Award, National Hog Farmer (Merlin Lindeman)
- 2 Achievement Award, American Meat Science Association (Gregg Rentfrow, Surendranath Suman)
- 1 Bobby Pass Excellence in Grantsmanship Award, CAFE (Surendranath Suman)
- 1 Special Visiting Researcher Fellowship, Government of Brazil (Surendranath Suman)

- 1 Early Career Achievement Award, American Society of Animal Science (Surendranath Suman)
- 2 Outstanding Young Animal Scientist Award – Research, Southern Section of American Society of Animal Science (Surendranath Suman, Kristine Urschel)
- 1 American Dairy Science Association Scholar (Jeffrey Bewley)
- 1 Bertebos Prize, Royal Swedish Academy of Agriculture and Forestry (Youling Xiong)

Notable Research Accomplishments

The research laboratory of Bernhard Hennig, Director of the University of Kentucky Superfund Research Center (consisting of more than 50 researchers from 15 departments in five different colleges within the university), focuses on the paradigm that healthful nutrition can modify or reduce the vulnerability to environmental stressors, such as persistent organic pollutants (e.g., PCBs). This has implications in health and disease risks in humans and animals (i.e., humans or animals who are environmentally stressed are more prone to disease risks). His project has produced conclusive evidence that a healthy diet can protect against vascular inflammatory diseases, such as atherosclerosis or heart disease, brought on by the toxic chemicals (PCBs, etc.). Some of his research findings have been featured nationally in several issues of NIH/NIEHS Environmental Factor, the University News, and College Magazine.

Major Limitations/Challenges/Needs

The remarkable success in AFS research is attributed to the collective effort: commitment and dedication of faculty, staff, graduate students, and other research personnel. In this process, strong administrative support is evident. However, it is a great challenge to sustain such productivity and maintain the quality of research. Some of the immediate challenges, if not effectively addressed, will definitely impede the progress of the research program. Major constraints and needs are listed below.

- Research equipment – Most equipment is very aged, with many outdated. There are critical needs for modern, state-of-the-art analytical instruments to allow AFS research to stay internationally competitive.
- Research laboratory space – This is a perpetual challenge. Both the laboratory spaces and the graduate student offices are very limited. The recent college survey of research lab space identified AFS's lab space as being the most utilized, while at the same time being ranked near the bottom in terms of quality.
- Graduate student/post-doctoral scholar office space – Office space for graduate students is severely limited, with 3-4 students often being housed an area designed for 1-2 students. Overcrowding negatively impacts graduate student morale and hinders their ability to study. Due to space limitations, the department has converted small lab instrumentation rooms into graduate student offices, further limiting laboratory space for research activities. Office space limitations makes it difficult to recruit students and postdoctoral researchers, even if funds are available.

- Access to campus core facilities – While the university provides access to centralized research facilities, many charge formidable user fees or testing fees. Examples include \$150 per sample for mass spectrometry identification of peptides and more than \$100 per hour for imaging facility user fee. The university should consider offer the service free of charge.
- Farm facilities – The milking parlor at the *Dairy Unit* is extremely outdated (early 1960's) and no longer reflective of modern dairy farming. It does not meet current research needs. There are ongoing needs to update the infrastructure at the research farms and facilities. Investments have been made in the research capacity at the Dairy Unit, but additional renovations are needed. At the *Horse Unit*, investments have been made in instructional facilities but not research facilities. In fact, the rapid growth of the undergraduate program in EQM as well as the growth in the ASC degree program has resulted in competition between instruction and research for space at the unit. Increasing requirements for recording and reporting animal use in research and teaching has elevated the amount of time that farm staff spend on office-type activities but there is no office space for them. There is also no temperature-controlled research area at the Horse Unit that would be similar to the intensive research facility at the C. Oran Little Animal Research Center Beef Unit. Absence of an intensive research facility limits research activities during the winter months and constrains many research activities during the rest of the year. There is a barn and paddock area available for renovation that could alleviate some of the space competition and provide a modern research facility and another barn space that could be remodeled for staff offices.
- Meat Lab – Due to the aging of the animal slaughter/meat processing rooms and facilities, including the freezer rooms and refrigeration rooms, there are frequent unit breakdowns. The current Meat Lab is operating under a maintenance mode at best. Funds are needed to renovate the Meat Lab to allow more effective and efficient functions to support meat/animal science research by AFS as well as the collaboration of FSIC with state clientele.
- Food Processing Pilot Plant – These facilities are in complete disarray. There is almost no usable processing equipment to allow the testing of new food products or a new production concept, a new food processing protocol, or the scale-up of a newly developed processing procedure. The pilot plant also serves the FSIC.

EXTENSION PROGRAM

Overview

The AFS Extension Program consists of 16 faculty and seven Extension Associates (five permanent, two temporary). The role of AFS Extension personnel is to provide resources to Agriculture and Natural Resources (ANR), Family and Consumer Sciences (FCS) and 4-H Youth Development (4-H YD) Extension Agents to enable them to improve the quality of life of

Kentucky's citizens. A multifaceted approach is utilized and individualized based on the type of clientele that are targeted. Our educational programs are primarily commodity oriented; however, we often coordinate activities within the department and across CAFE (i.e. Master Grazer Program).

Extension Personnel

Table 28 provides a listing of faculty with Extension appointments, and **Table 29** provides a listing of Extension Associates.

Table 28. AFS Faculty with Extension Appointments		
Name	Commodity/Area	Specialty
Amaral-Phillips, Donna	Dairy Cattle	Nutrition
Anderson, Leslie	Beef Cattle	Reproductive Management
Bewley, Jeffrey	Dairy Cattle	Dairy Systems, Management
Bullock, Kevin	Beef Cattle	Breeding and Genetics
Burris, Roy	Beef Cattle	Cow-Calf Management, Nutrition
Camargo, Fernanda	Equine	Anatomy, Health, Youth Programming
Coffey, Richard	Swine (<i>up to Feb. 2015</i>)	Nutrition, Management, Environment
Coleman, Robert	Equine	Nutrition
Dwyer, Roberta	Equine	Veterinary Medicine, Disaster Preparedness
Ely, Donald	Sheep	Nutrition, Management
Heersche Jr., George	Dairy Cattle	Reproductive Physiology, Youth Programming
Lehmkuhler, Jeffrey	Beef Cattle	Backgrounding Management, Nutrition
Newman, Melissa	Food Science	Food Microbiology, Food Safety, Disaster Preparedness
Pescatore, Anthony	Poultry	Nutrition, Management
Rentfrow, Gregg	Food Science	Meats
Vijayakumar, Paul	Food Science	Food Safety

Table 29. AFS Extension Associates	
Name	Specialty
Austin, Steve	Youth Livestock Programs (Beef, Sheep, Swine, Goats)
Crites, Benjamin	Beef Cattle Integrated Resource Management (IRM) Programs
Jacob, Jacquie	Poultry Programs and Youth Poultry Programs
Lawyer, Amy	Youth Equine Programs
Laurent, Kevin	Beef Cattle and Swine Programs
Tucker, Larissa	Youth Dairy Cattle Programs
Workman, Zach	Beef Cattle Forage Programs

Beef Cattle Extension Programs and Activities

Integrated Resource Management (IRM)

The goal of Kentucky Beef IRM is to increase the profitability of beef operations in Kentucky by using intense educational programming that will result in producers adopting proven, money-making practices. Current programs that have been developed and implemented through the IRM committee are Master Cattleman, Applied Master Cattleman, Master Stocker, Cattle Handling and Care, Pasture to Plate, Weaning 101 Workshop, and MAG-60 Program. Each of these are described in detail below.

Master Cattleman Program

Master Cattleman may be the most highly recognized extension program that is offered by the UK Beef IRM Committee. This program is composed of 10 different sessions with topics covering all aspects of beef production. Sessions include Facilities and Handling, Reproduction, Genetics, Nutrition, Herd Health, Environmental Concerns/Management, Marketing, Basic Management, Forages, and End Product. The respective Extension Specialist presents each session. This program is designed to increase producer's overall productivity and profitability. In order to successfully complete the program, participants must attend eight of the 10 sessions and also have a current Beef Quality Assurance (BQA) certification. All program attendees receive a set of materials that serve as a reference for future use and those who complete the program requirements receive a personalized farm gate sign. **Table 30** shows funding and number of participants for the Master Cattleman Program.

	2011	2012	2013	2014	2015	2016
Funding	\$7,650	\$7,650	\$29,600	N/A	\$50,500	N/A
Number Participants	223	171	264	N/A	254	N/A

Faculty and Extension Associates involved in Master Cattleman include Les Anderson, Michelle Arnold (Veterinary Science), Darrh Bullock, Kenny Burdine (Agricultural Economics), Roy Burris, Greg Halich (Agricultural Economics), Steve Higgins (Biosystems and Agricultural Engineering), Jeff Lehmkuhler, Gregg Rentfrow, Ray Smith (Plant and Soil Sciences), Blair Knight, and Ben Crites.

Applied Master Cattleman Program

The Applied Master Cattleman program is designed to be an extension of the Master Cattleman program. This program is more in depth and hands-on; allowing producers to take a step further and build upon the information that was presented through the Master Cattleman sessions. Groups have the option of selecting sessions they are interested in and choosing as many of the sessions they would like. These sessions are offered through classroom instruction. Topics that have been covered include Genetics, Marketing, Reproduction, End Product, Health, Handling and Facilities, Nutrition, and Forages. Offering these topics/sessions “buffet style” allows groups to be able to build educational programs to better suit their particular needs. **Table 31** shows funding and number of participants for the Applied Master Cattleman Program.

Table 31. Funding and Number of Participants for Applied Master Cattleman Program

	2011	2012	2013	2014	2015	2016
Funding	\$33,000	\$33,000	\$11,500	\$11,500	\$22,500	\$21,000
Number Participants	70	95	250	94	150	522

Faculty and Extension Associates involved in Applied Master Cattleman include Les Anderson, Roy Burris, Jeff Lehmkuhler, Darrh Bullock, Ray Smith (Plant and Soil Sciences), Kenny Burdine (Agricultural Economics), Gregg Rentfrow, Kevin Laurent, Blair Knight, and Ben Crites.

Master Stocker Program

The Master Stocker program is composed of eight classroom sessions along with one field trip tour. Aspects covered during the course will improve the understanding of best management recommendations for stocker and backgrounding operations. Sessions offered include: Enterprise Budgeting and Cost of Production, Economic Risk Management Tools, Marketing, Forage Management, Health Programs, Nutrition Management, Environmental Compliance and Best Management Practices, and Animal Handling, Transporting, and Welfare. In order to successfully complete the Master Stocker program, producers must attend all eight sessions, have a current BQA certification, and have an approved Water Quality plan as well. **Table 32** shows funding and number of participants for the Applied Master Cattleman Program.

Table 32. Funding and Number of Participants for Master Stocker Program

	2011	2012	2013	2014	2015	2016
Funding	\$19,000	\$19,000	N/A	\$20,970	N/A	N/A
Number Participants	250	130	N/A	115	N/A	N/A

Faculty and Extension Associates involved in Master Stocker include Jeff Lehmkuhler, Roy Burris, Kenny Burdine (Agricultural Economics), and Kevin Laurent.

Cattle Handling and Care Certification Program

The Cattle Handling and Care program is a video module that can be viewed by producers at their local county extension offices. Material included in the video feature the National Cattlemen’s Beef Association (NCBA) Producer Code of Cattle Care, proper use of handling aids, facility design, animal handling, nutritional impacts, genetics, dystocia and proper injection, castration, and dehorning techniques. Upon completing the video, producers are required to take a 35-question test. Participants must answer 30 or more questions correctly in order to successfully complete the program and become Cattle Handling and Care Certified. **Table 33** shows funding and number of participants for the Applied Master Cattleman Program.

Table 33. Funding and Number of Participants for Cattle Handling and Care Program

	2011	2012	2013	2014	2015	2016
Funding	N/A	N/A	N/A	\$24,800	\$9,800	\$19,588
Number Participants	N/A	N/A	N/A	995	691	530

Faculty and Extension Associates involved in Cattle Handling and Care include Darrh Bullock, Roy Burris, Jeff Lehmkuhler, Les Anderson, Michelle Arnold (Veterinary Science), Kevin Laurent, Blair Knight, and Ben Crites.

Pasture to Plate Program

The Pasture to Plate program is designed to educate producers on a variety of topics in finishing beef cattle. Groups of 10 head of cattle were placed on feed at each of the following locations; UKREC in Princeton, the Morgan County Extension farm, and the Eden Shale farm. Once the cattle had been received, they were followed through the entire finishing period. Producers have had the opportunity to learn more about feeder cattle grading, processing feeder calves, environmental issues, nutrition, and health concerns associated with the process of finishing cattle. Both live animal evaluation and carcass evaluation are included as part of the program as well. **Table 34** shows funding and number of participants for the Pasture to Plate Program.

Table 34. Funding and Number of Participants for Pasture to Plate Program						
	2011	2012	2013	2014	2015	2016
Funding	N/A	N/A	N/A	N/A	\$103,550	\$92,967
Number Participants	N/A	N/A	N/A	N/A	90	134

Faculty and Extension Associates involved in Pasture to Plate include Darrh Bullock, Jeff Lehmkuhler, Steve Higgins (Biosystems and Agricultural Engineering), Gregg Rentfrow, Paul Vijayakumar, and Ben Crites.

Eastern Kentucky Integrated Reproductive Management Program

The Eastern Kentucky Integrated Reproductive Management program is designed to educate ranchers on the importance of reproductive performance and the many factors that influence reproductive efficiency. This is an educational program with two components. First, UK Beef Specialists conduct evening classroom sessions that cover all aspects of reproduction efficiency. Second, the most powerful teaching tool we use in this program is demonstration herds. At least one demonstration herd is identified in each participating county and that herd receives one-on-one consultation with UK Specialists to improve their herd reproductive performance. Numerous field days were scheduled and the data collected from each farm was used to demonstrate impact. **Table 35** shows funding and number of participants for the Eastern Kentucky Integrated Reproductive Management Program.

Table 35. Funding and Number of Participants for Eastern Kentucky Integrated Reproductive Management Program						
	2011	2012	2013	2014	2015	2016
Funding	N/A	N/A	N/A	N/A	\$22,870	\$22,870
Number Participants	N/A	N/A	N/A	N/A	82	110

Faculty and Extension Associates involved in Eastern Kentucky Integrated Reproductive Management Program include Les Anderson, Roy Burris, Jeff Lehmkuhler, Darrh Bullock, Kevin Laurent, and Ben Crites.

Management and Genetics (MAG)-60 Program

To enhance the value of our feeder calves, UK and the Kentucky Beef Network (KBN) has launched the MAG-60 (60-day post weaning) program. In this program, KBN has partnered with beef producers to synchronize estrus in their beef females for timed insemination. Females are time-inseminated to reduce the labor costs associated with AI. Producers AI their females to a small, select group of sires that are proven in their ability to sire productive, profitable calves. The sires used were selected by a committee that consists of UK Beef Extension Specialists, representatives of the semen supply companies, KBN, and producers. The same sires will be used for the entire project (three breeding seasons).

Steers sired by AI will be managed according to CPH health requirements and will be backgrounded for a minimum of 60 days post weaning. The calves will be age and source verified and will be subjected to ultrasound to determine potential carcass merit. Thus, we will be marketing feeder steers that are age, source, and genetically verified for superior performance. According to our previous data (see above), these calves are \$150 more valuable at harvest than steers from the same herds that are sired by non-proven natural service sires. Marketing agents in Kentucky have predicted that feeder calves that are age, source, and genetically verified are likely worth \$7-10 more per hundred than a normal CPH-45 feeder if sold in load lots. Feeders produced in this program will be co-mingled by our marketing agents and marketed either in CPH-like feeder calf sales, internet video sales, or directly to feedlots.

The heifers from the MAG-60 program will also greatly enhance the ability of our producers to increase profits. First, since all calves will be subjected to carcass ultrasonography, our cooperators herds can retain heifers with the genetic potential to excel in carcass traits. Second, heifers not retained will be developed and sold in a premium bred-heifer sale. This heifer sale(s) should also increase the cooperator's opportunity to diversify their marketing options and increase the profit potential.

Marketing data indicates that numerous loads of like cattle are needed to optimize market value. To obtain at least 1,000 steers for market, we must AI about 4,000 cows (50-60% conception rate and 50% of each sex). Thus, our goal is to AI at least 4,000 females each breeding season to ensure that 1,000-1,100 steers will be available to market.

Table 36 shows funding and number of participants for the MAG-60 Program.

Table 36. Funding and Number of Participants for MAG-60 Program						
	2011	2012	2013	2014	2015	2016
Funding	N/A	N/A	N/A	N/A	N/A	N/A
Number Participants	56	145	60	N/A	N/A	N/A

Faculty and Extension Associates involved in MAG-60 include Les Anderson and Darrh Bullock.

Weaning 101 Workshop

This program focuses on a variety of areas pertaining to the weaning period. Topics to be covered during the event include Vaccination Protocols, Implanting Strategies, Developing a

Feeding Program for Weaned Calves, Management of Lots for Weaning, Feeder Cattle Grading, and the Economics of Weaning Calves. Participants will have the opportunity to gain hands-on, chute-side experience of processing calves, including proper vaccine handling and injection sites, implanting techniques, and ear tagging.

Faculty and Extension Associates involved in Weaning 101 Workshop include Jeff Lehmkuhler, Michelle Arnold (Veterinary Science), Steve Higgins (Biosystems and Agricultural Engineering), Kenny Burdine (Agricultural Economics), and Ben Crites.

Kentucky Heifer Development Program

The expense necessary to develop replacement females is one of the greatest investments a beef producer makes. Kentucky's beef producers have made tremendous strides in recent years in the production of properly managed yearling heifers. The Elite Heifer Program was developed not only to educate producers on heifer development but also to serve as a supply of high quality replacement females. The Elite Heifer Sale in Bourbon County was the first successful program and several heifer development sales are currently being conducted.

In addition to these sales, a center for heifer development has been established in Kentucky. Most small producers have neither the time nor the separate handling facilities to properly develop heifers; therefore, participation in these heifer sales by small producers has been limited. The heifer development center was designed to give both large and small beef producers the opportunity to develop their heifers. Utilizing this center, producers have the opportunity to consign their heifers for development at the center. Producers deliver the heifers to the center either at or near weaning. The center then professionally develops all heifers according to strict guidelines. The heifer development center grows the heifers to their target weight, performs pelvic area measurements and reproductive tract scores, and prepares the heifers for estrus synchronization and artificial insemination. All heifers are subjected to estrus synchronization and are inseminated to a single, proven calving-ease bull. After pregnancy diagnosis, producers can select which heifers to retain for their cowherd. Heifers not selected can be marketed through a sale similar to the Elite Heifer Program.

The first center developed was the Eastern Kentucky Heifer Development Center (EKHDC) in Perry County. The heifer sales from the EKHDC's sales have been successful. Profit margins for the producers were estimated to be between \$150 and \$200 per heifer; however, many of the heifers go back to the origin farm as replacements.

Faculty and Extension Associates involved in Kentucky Heifer Development include Les Anderson, Jeff Lehmkuhler, and Darrh Bullock.

Beef Cattle Genetic Improvement Program

The Beef Cattle Genetic Improvement Program is a County Agricultural Investment Program (CAIP) of the Ag Development Board. Through this program, producers are able to get cost-share dollars for up to half the purchase of a bull or semen, as long as the bull meets certain requirements. The requirements for the program include educational activities on proper bull selection, breeding soundness exams and production requirements based on Expected Progeny Differences (EPDs). Producers must decide the type of bull that would best fit their operation,

prior purchasing the bull, from the following sire types: Heifer Acceptable; Balanced Trait; Terminal Sire; Low Maintenance; High Productivity; or Carcass Merit. Within each sire type, the bull must meet certain production criteria based on his computed EPDs.

The faculty member involved with Beef Cattle Genetic Improvement is Darrh Bullock.

Kentucky Beef Quality Assurance (BQA) Program

The Kentucky BQA program began in 2001 as an effort to educate KY beef producers in the best management practices for animal care to ensure a safe and wholesome beef product for consumers. Since 2001, over 17,000 different beef producers have been certified. Certification lasts three years and currently there are 7,726 producers certified. KY ranks third in the country in total active certifications behind Texas and Tennessee.

Faculty and Extension Associates involved in BQA include Kevin Laurent, Darrh Bullock, Ben Crites, Roy Burris, and Jeff Lehmkuhler.

Certified Preconditioned for Health (CPH-45) Program

The CPH-45 program is a premium feeder calf management program developed and administered through collaboration between UK, Kentucky Cattlemen's Association (KCA), KBN and the Kentucky Department of Agriculture. To qualify for the program, cattle must be managed according to specific guidelines and identified with an official CPH-45 tag. Cattle are graded and sorted according to weight, breed and sex to insure uniform groups are sold.

Benefit to the producer include:

- Opportunity to market cattle in large uniform lots
- Small producers benefit from all numbers in the system
- Builds the reputation and ultimate value of Kentucky cattle
- Simplified access to premium market
- Cattle marketed on true merit
- Access to premiums for better management
- Additional weight gain during the weaning period
- A national advertising campaign

Benefit to the buyer include:

- Uniform health program
- Decreased pull rates
- Decreased death loss
- Increased performance
- Consistency in size and type of cattle
- Ability to track cattle
- Working relationship with cow/calf producers to develop a more uniform product
- \$200 guarantee (no bulls or bred heifers)
- All consignor Beef Quality Assurance certified

Faculty and Extension Associates involved in CPH-45 include Roy Burris and Kevin Laurent.

West Kentucky Select Bred Heifer Sales

The West Kentucky Select Bred Heifer Sales were established in 2000 in Guthrie, KY, to provide an opportunity for western KY producers to buy and sell value added replacement heifers. Prior to 2000, western KY producers had to travel to central KY or out of state to take advantage of top-tier replacement heifer sales. In the 13 sales held since 2011, a total of 2,413 heifers, from 24 different consignors, sold for an average price of \$2077 per head. This is a gross value of \$5,011,888. Four hundred-two buyers from four different states purchased cattle during this time period. Approximately one third of these buyers were repeat customers. Most of the cattle sold in these sales were purchased by producers who reside within 100 miles of Guthrie, KY. A significant number of replacement heifers sell private treaty each May and November based on the results of these sales.

Faculty and Extension Associates involved in West Kentucky Select Bred Heifer Sales include Kevin Laurent, Roy Burris, Darh Bullock, and Les Anderson.

4-H/Youth Beef Cattle Events and Activities

The beef Extension group is involved in several beef youth activities on both state and national levels. These activities include:

- Assisting with the State 4-H Livestock Judging Contest.
- Assisting with the National 4-H, Junior College, and Collegiate Livestock Judging Contests.

Dairy Cattle Extension Programs and Activities

DAIReXNET (National Dairy Extension Resource)

DAIReXNET, a national, extension-driven web resource, is designed to meet the educational and decision-making needs of dairy producers, allied industry partners, extension educators and consumers. Through collaboration amongst dairy professionals, relevant, cutting-edge information and learning opportunities are provided which are science-based and peer-reviewed in a format accessible 24/7. Informational resources include:

- Access to valuable dairy information currently in 12 subject areas (467 articles available)
- Access to top experts in their fields of expertise (1,301 questions answered)
- 62 archived webinars and video presentations on a variety of dairy topics
- Searchable state and regional dairy newsletters
- Consumer links and youth classroom resources

Over the years, leadership for this project has been provided by a rotating group of dairy extension professionals from across the United States. Our subject areas have also been led by dairy experts from all over the US. To date, over 450 dairy professionals have contributed to this resource, representing 41 US universities and colleges, many allied industries, and three foreign countries. From July 1, 2011 through June 30, 2017, we have had an average of 38,435 views per month (2,767,294 total page views) with people spending an average of 3 minutes, 5 seconds per page. DAIReXNET can be accessed through the following web address:

http://articles.extension.org/dairy_cattle.

Faculty and Extension Associates involved in DAIREXNET include Donna Amaral-Phillips and Nancy McGill. Funding in the amount of \$445,767 has been generated to support this program.

Silage – Setting the Stage for Top Milk Production

Improving the quality of forages harvested and stored as silage directly impacts a dairy farm's profitability. These programs, offered in 2016, were held on three different dairy farms and entailed demonstrating how to evaluate forage harvest practices on farm. Concepts discussed were reinforced through published articles. One hundred-fifteen individuals have participated in the program. The Kentucky Dairy Development Council (KDDC) staff continuously talks positively about these programs, especially the hands-on approach used, and follow-up visits have been made on individual farms regarding the concepts presented.

The faculty member involved in this program is Donna Amaral-Phillips, in collaboration with KDDC.

Automatic Calf Feeders – Are They for Your Operation?

Research has shown that increased consumption of colostrum and improved growth in dairy calves the first 2 months of life can translate into 1,000 to 4,500 lbs more milk in their first lactation. Automatic calf feeders, used in pens that house calves in groups, deliver additional milk in smaller and more frequent meals, and change labor and facility needs. This technology is used to feed and house both dairy heifers and steers. To address incorporating this technology on KY farms, this program, offered in 2015, was designed and delivered targeted educational programs for improving management and productivity of young stock (3 regional meetings involving 55 participants, with additional farm visits).

The faculty member involved in this program is Donna Amaral-Phillips, in collaboration with UK CES Agriculture Agents.

Preventing Loser Dairy Cows

This educational program, offered in 2013-14, was designed to improve management and the productivity of pre-calving dairy cows (6 regional meetings with 125 participants), an area often neglected on farms and by consulting nutritionists. Concepts discussed during these programs are reinforced in articles published through *KY Dairy Notes*. When surveyed, farmers gave a high rating regarding the quality of these programs (4.6/5) and indicated they increased their knowledge.

Faculty involved in this program are Donna Amaral-Phillips and Jeffrey Bewley.

Calf Nutrition Impacts Future Milk Production

Improving the quality of forages harvested and stored as silage directly impacts a dairy farm's profitability. These programs, offered in 2013, were held on eight different dairy farms (with 155 participants) and entailed demonstrating how to evaluate forage harvest practices on farm. Concepts discussed were reinforced through published articles. The KDDC staff continuously speak positively about these programs, especially the hands-on approach used, and several follow-up farm visits were held regarding the concepts presented.

The faculty member involved in this program is Donna Amaral-Phillips.

Dairy Production Shortcourses

This intensive series of one-day programs, offered in 2011-17, was designed to help dairy producers learn more about implementation of sound production practices while they develop friendships and learn from one another. The farmers design these programs with the help of their county extension agents and state extension specialists. Each year the farmers have chosen three areas for a winter educational series. Each series was attending by 10-15 individuals.

Faculty involved in this program are Donna Amaral-Phillips, Jeffrey Bewley, and George Heersche.

Dairy Nutrition and Feeding Management Programs

The Kentucky Dairy Industry has undergone several financial (high feed costs and/or low milk prices) and weather related challenges. To help dairy farmers survive these challenges, regional meetings were conducted in 2011-17, and numerous written peer-reviewed, newsletter articles were published in electronic format on-line and provided to KY Extension Educators for use in local newsletters, social media and newspaper articles. In addition, farmer's individual questions regarding feeding programs and implementation of sound, balanced rations for both the dairy milking herd and replacements have been answered

The faculty member involved in this program is Donna Amaral-Phillips.

Western KY Summer Meeting – Adult Program

This educational program, for Amish/Mennonite dairy families, serves to not only bring science-based programming to farm owners but also the next generation of young farmers whom are part of their parent's operation (14 to 21 years of age) and their younger siblings (ages 6 to 13). In 2012 and 2013, five separate, daylong programs were held in each of two local communities. The impact of this program came through in subsequent farm visits when a farmer mentioned he was routinely monitoring items we had covered and another farmer's son mentioned that his cousin did not know that the rumen microorganisms were living organisms and bacteria were impacted by management of feeding program. After 2013, this program has been held solely in the summer and attendance has increased tremendously. Attendees have ranged from 150-300 per year.

Faculty involved in this program are Donna Amaral-Phillips and Jeffrey Bewley, in collaboration with KY Dairy Development Council and local dairy industry. Dairy graduate students have also been involved in delivering this program.

Dairy Challenge

Dairy Challenge is an annual scholastic competition where undergraduate students evaluate a dairy operation and develop and present their recommendations for ways to improve this operation. To prepare for this competition, teams have visited 5 to 10 dairy farms and prepared recommendations for these farms. This program, offered in 2011-16, represents an integration of the extension and instruction areas of the land-grant mission of universities while training future dairy leaders.

The faculty member involved in this program is Donna Amaral-Phillips, with assistance from UK dairy graduate students and in collaboration with KY dairy producers.

Collaboration with KY Dairy Development Council and Other Industry Partners

The UK Dairy Group annually has several collaborative programs with KY Dairy Development Council (KDDC), the KY dairy producer and allied industry group. We serve as an ex-officio member of the KDDC, jointly plan and conduct the statewide dairy meeting, are presenters at various educational meetings and farm tours, and provide a bi-monthly column for their magazine.

Faculty and Extension Associates involved in this program include Donna Amaral-Phillips, Jeffrey Bewley, George Heersche, and Larissa Tucker.

KY Dairy Notes Newsletter and Website for Archived Articles

KY Dairy Notes, the Dairy Group's 6-page newsletter, is published monthly and contains articles of tried-and-true management practices as well as introductions to cutting-edge research and technology. This publication is our main avenue of reaching our dairy cliental in KY and across the US. Three hundred-forty individuals receive this newsletter electronically. In addition, all 120 UK CES Agriculture and Natural Resource Agents receive this publication and can then distribute it to their cliental locally.

Faculty and Extension Associates involved in this program include Donna Amaral-Phillips, Jeffrey Bewley, George Heersche, and Larissa Tucker.

Kentuckiana Dairy Exchange

The Kentuckiana Dairy Exchange, offered in 2011-15, was a joint program between CAFE and Purdue University, with sponsorship and support from the KDDC. This forum was designed for the exchange of ideas and information between producers within and across KY and IN. Funding in the amount of \$50,000 supported this program, and 600 clientele have participated.

Faculty and Extension Associates involved in this program include Jeffrey Bewley, Donna Amaral-Phillips, Larissa Tucker, and Jack McAllister.

Compost Bedded-Pack Barns

Compost bedded-pack barn adoption has increased dramatically during the last five years. We have worked with dairy producers in Kentucky to better understand the system. We surveyed existing compost bedded pack barns in 2011. Follow-up applied on-farm research projects occurred in 2013-2015. Funding in the amount of \$67,625 has supported this effort, and 90 clientele have participated.

Faculty involved in this program are Jeffrey Bewley and Joe Taraba (Biosystems and Agricultural Engineering).

Southeast Quality Milk Initiative

The Southeast Quality Milk Initiative, offered in 2013-17, is a USDA funded (\$596,645), integrated project aimed at improving milk quality throughout the region. One phase of this project involved intensive audits of 96 farms. Another phase includes nine farms to be used as demonstration farms. Multiple publications and meetings have occurred as a result of this project. The Regional Southeast Quality Milk Initiative annual meeting was hosted in Kentucky in 2015. To date, 250 clientele have participated in various aspects of the program.

Faculty involved in this program are Jeffrey Bewley, Michelle Arnold (Veterinary Science), and Donna Amaral-Phillips.

Freestall Barn Flipping

Opportunities for farm-specific freestall barn modifications with 25 producers were pursued in 2011-17. The potential economic impacts of freestall modifications on 20-40 year old facilities toward increased production, reduced lameness, improved milk quality, reduced culling rates, and increased longevity are immense. To date 250 clientele have participated in educational opportunities arising from this effort.

The faculty member involved in this program is Jeffrey Bewley.

Precision Dairy Farming Applied Research and Outreach

Precision Dairy Farming is the use of technologies to measure physiological, behavioral, and production indicators on individual animals to improve management strategies and farm performance. Efforts have been undertaken to help educate Kentucky dairy farmers over the last few years (2011-17). Multiple field studies have been conducted. Farmers are generally satisfied with their experiences. In 2017, the Precision Dairy Farming conference was held in Lexington. To date 200 clientele have participated in educational opportunities arising from this effort.

The faculty member involved in this program is Jeffrey Bewley.

Kentucky FarmStart

As part of the overall Kentucky FarmStart program, extension specialists prepared a short course for beginning and young dairy producers covering all areas of dairy management. In addition to the course content, participants were provided a binder with supplementary materials. Funding in the amount of \$561,564 has supported this program, and 40 clientele have participated.

Faculty and Extension Associates involved in this program include Jeffrey Bewley, Donna Amaral-Phillips, George Heersche, and Larissa Tucker.

Dairy Recruitment

In an effort to try to attract more students with farm backgrounds to UK, in 2015-17 the dairy extension group has been organizing an annual student recruitment event. Twenty-five individuals have participated in this event and it has helped in attracting dairy students to our program.

Faculty and Extension Associates involved in this program include Larissa Tucker, Jeffrey Bewley, Donna Amaral-Phillips, and George Heersche.

CowSignals

CowSignals is a program, offered in 2013-17, focused on reading cow signs to help identify issues and opportunities. This program is very hands-on with many practical, take-home messages for dairy farmers. This program has included group presentations and field days, and has impacted 75 clientele.

Faculty involved in this program are Jeffrey Bewley, Michelle Arnold (Veterinary Science), and Donna Amaral-Phillips.

Robotic Milking

In 2016, the extension group invited Jack Rodenburg from Ontario, Canada, to introduce Kentucky dairy farmers to the concept of robotic milking and discuss factors for investment in and management of these facilities. Over 90 dairy clientele participated in this activity.

Faculty involved in this program were Jeffrey Bewley and Donna Amaral-Phillips.

Social Media

Since 2012, the UK Dairy Science program has an active social media presence. The UK Dairy Science Facebook page has 1,153 likes and the Precision Patty (focused on precision dairy technologies) page has 618 likes. A variety of information is also posted to LinkedIn and Twitter.

Faculty involved in this program are Jeffrey Bewley, Larissa Tucker, Donna Amaral-Phillips, and George Heersche.

One-on-One Farm Visits/Personal Consultations

Each member of the dairy extension team conducts individualized farm visits and personal consultations to assist dairy producers, troubleshoot, or find opportunities for improvement.

Faculty and Extension Associates involved in this activity include Donna Amaral-Phillips, Larissa Tucker, Jeffrey Bewley, and George Heersche.

4-H/Youth Dairy Cattle Events and Activities

George Heersche and Larissa Tucker provide leadership and coordination for all of AFS's 4-H/Youth dairy events and activities. These include events and activities that are regional, statewide, and national in scope. A listing of these include:

- *Kentucky Dairy Jeopardy Contest* – Junior and senior individuals are asked questions about the dairy industry in a series of one-on-one contests. The Kentucky Dairy Jeopardy Contest is usually held in May. The top four seniors are chosen to represent Kentucky at the North American Invitational Dairy Quiz Bowl in November.

- *Dairy Cow Camp* – This is a statewide event for dairy cattle judging training and fellowship usually held on a Saturday in April.
- *Dairy Skillathon* – This event encourages youth to learn the practical and scientific aspects of dairy cattle husbandry and dairy food nutrition and safety. It is held on the Wednesday night before the opening of the Kentucky State Fair.
- *Kentucky 4-H Non-Ownership Dairy Animal Project* – The purpose of the 4-H Non-Ownership Dairy Animal Project is to provide an opportunity for 4-H youth who do not live on a farm to care for and show a registered dairy animal without the animal being transferred into the youth's name.
- *Kentucky Dairy Judging Contest* – This contest, held in Lexington during June, is open to junior and senior members.
- *District 4-H Dairy Shows* – These shows, held in June and early July, are conducted by the Cooperative Extension Service and the Division of Shows and Fairs. Youth can show registered or grade animals of the dairy breeds. The show locations are Shelbyville, Bowling Green, Edmonton, Harrodsburg, Liberty, and Tollesboro.
- *Advanced Dairy Judging Workshop* – Additional training is offered for youth who are the top senior individuals at the state judging contest in July or August. First, second, and third teams are selected based on scores from the state contest and the advanced workshop.
- *Kentucky State Fair 4-H/FFA Junior Dairy Show* – This event is held Thursday and Friday at the start of the Kentucky State Fair.
- *Pennsylvania All-American Judging Contest* – This contest is held in Harrisburg, Pennsylvania, during September. Participants are the top Kentucky 4-H dairy judging team.
- *National 4-H Dairy Cattle Judging Contest* – This contest is held in Madison, Wisconsin, during late September or early October. The trip lasts for about one week. Participants are the top Kentucky 4-H dairy judging team.
- *National 4-H Dairy Conference* – This super conference is held in and around Madison, Wisconsin, during the last week of September or first week of October. Kentucky participants are selected from youth nominated by county Extension agents and leaders.
- *Dare to Dairy* – This event is hosted in cooperation with the UK Dairy Club, and is designed to give youth the opportunity to experience some of the science behind animal agriculture, while highlighting dairy farming. It is held at the UK Coldstream Dairy Unit on a Saturday in October.
- *Garland M. Bastin Dairy Scholarship Award* – This award is given annually to the 4-H youth who has exhibited enthusiasm, ability, and exceptional personal character while judging dairy cattle. A scholarship is awarded if the youth attends the University of Kentucky and majors in a dairy-related field.
- *North American Invitational Dairy Quiz Bowl* – This event is held at the Kentucky Fair and Exposition Center in Louisville on the first Friday and Saturday of the North

American International Livestock Exposition. The senior winning team from the state Dairy Quiz Bowl Contest represents Kentucky.

- *North American Invitational Youth Dairy Cattle Judging Contest* – This contest was held for the first time in 1982 in conjunction with the North American International Livestock Exposition in Louisville. A team selected from the top senior dairy judges represents Kentucky.

Equine Extension Programs and Activities

First Time Horse Owners

This program is a part of Ag Equine Programs Agent Working Group. The purpose of the group is to develop resources for new horse owners, and educate them about their responsibilities, horse care, horse health, husbandry, management and cost of ownership. A horsemanship clinic was developed and conducted in April, 2011, and March, 2012. In 2011, the workshop was divided into classroom and hands-on training. Based on evaluation results, we changed the format for 2012 for hands-on only. This clinic was offered as an in-service training for agents. There were 55 participants in 2011 and the cutoff for the 2012 clinic was 17.

Faculty and Extension Associates involved in this activity included Fernanda Camargo and Amy Lawyer.

Horse College

Horse College is a multi-county program offered in 2011-16 that works primarily with the recreation horse owner. While some attendees may breed horses, the primary focus is on the horse owner who rides for recreation and possibly participates in horse shows. The clientele over the reporting period is three groups of horse people. The first is that group looking at their first purchase of a horse and are gathering information. The second group is current horse owners looking to adopt new ideas, and the third is horse owners who will look at new ideas but are concerned that what they are doing now is okay.

Because of the more basic nature of the client needs, the program has focused on topics that meet those needs. Over the four-night program topics in nutrition, health, facilities, hoof care, behavior and equipment have been the primary areas of education. To facilitate the program industry professionals are invited to speak to cover the topics of horse health and hoof care. The horse specialist presents the remaining topics.

Funding is by the participants and in 2011 and 2012, funding was provided by the Kentucky Horse Council to the amount of \$500 per year. This funding covered the cost of printing. Now the costs are a county expense.

The program has had 5-8 programs per year, offered in the fall and winter months, with 15-18 counties participating each year. To date the total number of horse owners participating is 1,750.

The faculty member involved with this program is Bob Coleman.

Master Horse Owner 2017

In consultation with county agents, this new multicounty program was started in 2017. The clientele will be similar to the Horse College participants, but the subject matter and the program delivery will be changed. The new program features a greater list of specific topics in shorter sessions. This change allows for the program to be delivered in different time frames (i.e., as a Saturday morning program, a program delivered on consecutive evening sessions, or even a Friday night followed by a partial Saturday program). This has given agents a new program to offer their horse owners. One program has been offered so far in 2017 with 30 people in attendance from five counties and three states. There are three sessions scheduled for Fall 2017 in counties where equine extension programming has not been offered for the adult horse owner.

The faculty member involved with this program is Bob Coleman.

Multi-Jurisdictional Animal Resource Coordination Exercise (MARCE 2017)

MARCE 2017 was a functional animal disaster exercise that engaged over 150 participants from state departments of agriculture, state veterinarians, state emergency managers, and other stakeholders. Sixteen states participated in this Homeland Security Exercise and Evaluation Program (HSEEP) Complaint exercise held July 11-14, 2017. HSEEP compliance is required for garnering national disaster exercise funding, as it requires “best practices” in exercise planning, execution, and documentation. Participants had to respond animal related issues caused by a major natural disaster scenario and request out-of-state resources and capabilities from other states, non-governmental organizations, and the federal government. These requests had to be through established standard methods of communication and required paperwork (for FEMA reimbursement). State participants also were trained to develop and utilize Mission Ready Packages. Funding to support this exercise was \$75,000 from USDA APHIS.

Faculty and Extension Associates involved with this training were Roberta Dwyer, Melissa Newman, Andrea Higdon (CAFE Emergency Management System Director), and Kandi Williams (CAFE Extension).

Equine Biosecurity Training/Consulting

This annual activity has resulted in publications, presentations at state and national meetings, and on-site and telephone consultations on biosecurity and equine infectious disease issues.

The faculty member involved with this program is Roberta Dwyer.

Equine Wellness Clinic

This 2017 program integrates research, outreach, and student training, provides wellness exams for horses of underserved equine owners in Eastern Kentucky and the Amish community in Hardin County. Over the course of three days, over 200 horses owned by 35 individuals from three Eastern Kentucky counties (Boyd, Whitley, Jackson) and over 120 horses from Hardin County were examined. Fecal egg counts were performed on all horses, approximately 60 horses were vaccinated for botulism, teeth floating was performed on about 15 horses, and several horses were examined for a variety of disease symptoms. Horse owners were educated about horse diseases and a horse’s susceptibility to disease.

Faculty and Extension Associates involved with this training were Fernanda Camargo, Amy Lawyer, Dr. Martin Nielsen (Veterinary Science) and his students from the Gluck Equine Research Center, and is offered in collaboration with UK Ag Equine Programs Agents Working Group, Extension Agents, and Dr. Pedro de Pedro from Ross University's Vet School. Undergraduate students in ASC and EQM also helped with this program.

Saddle Up Safely

This program, launched in 2009, has the objective to improve the safety in horseback riding. Over 100 blogs (which have been accessed over 100,000 times) have been written on horse safety and general horse health care, and eight safety brochures have been published (Safe Return to Riding, Trailering your Horse Safely, Travel to New Environments, Pasture Safety, Barn Safety, Horseback Riding Safety, Horse Related Injury, and Horse Transmitted Disease). A web site (<http://ukhealthcare.uky.edu/saddleup/>) is also maintained.

Faculty and Extension Associates involved with this program include Fernanda Camargo and Amy Lawyer.

Body Condition Score Workshop

This hands-on workshop teaches attendees how to perform a Body Condition Score (BCS) evaluation using the Henneke system. Beginning in 2010, guidelines were established that required horses to have a minimum BCS of 4 to be allowed to participate in any of the 4-H activities, events, and competitions. To date this workshop has been offered seven times with over 260 individuals participating (including Extension Agents, adult leaders and youth). Two Fact Sheets were developed to aid with the training (ASC 188 Help! My Horse is Too Thin and ASC 187 Help! My Horse is Too Fat).

Faculty and Extension Associates involved with this program include Fernanda Camargo and Amy Lawyer.

4-H/Youth Equine Programs and Activities

Fernanda Camargo and Amy Lawyer provide leadership and coordination for all of AFS's 4-H/Youth equine events and activities. These include events and activities that are regional, statewide, and national in scope. A listing of these include:

- *Kentucky 4-H Horse Program* – Provides learning opportunities for youth through camps, clinics, seminars, the State 4-H Horse Show, the State 4-H Horse Contest, and the State 4-H Horse Judging Contest. The State 4-H Horse Contest is a 2-day competition involving approximately 250 youth, and includes horse bowl, hippology, public speaking, individual presentation, team presentation, photography, and arts and crafts. The State 4-H Horse Judging Contest is a 1-day contest involving approximately 120 youth, with 8 to 10 horse judging classes. The State 4-H Horse Show is an 8-day event involving over 700 youth and 800 horses in eight divisions: Hunter, Miniature, Saddleseat, Walking/Racking/Mountain, Contest, Western, Equestrian with Disabilities and Drill Team.
- *4-H Horse Volunteer Certification Program* – This program, which was implemented in Fall 2010, provides training to adult volunteer club leaders on youth development. Volunteers are trained to use the curriculum and resource kit that was developed for

county clubs, as well as how teach youth in a fun, interactive way. To date there have been 14 horse certification workshops where over 350 volunteer leaders have been certified.

- *Horse Discovery Website* – This valuable resource covers nine different topics (breeds, bits, equipment, external parasites, forages, internal parasites, record keeping, judging, and shoes), and is an excellent learning resource for youth and adults alike. Webpage can be found at <http://www2.ca.uky.edu/horsediscovery/>.
- *Kentucky 4-H Volunteer Forum* – This is a biannual event sponsored by the State 4-H Office. A Horse Track, consisting of 7-11 workshops and presentations are conducted to provide updates and training to Extension Agents and Volunteer Leaders on the 4-H Horse Program. The forum also provides an opportunity for Certified Volunteer Leaders to receive subject matter training. My role in 2012 and 2014 was to coordinate the Horse Track in the Volunteer Forum, recruit and select the workshop speakers, and run the Horse Track during the event. 30-50 individuals (Extension Agents, Volunteer Leaders, and 4-H members) typically attend each session.
- *Kentucky Equine Youth Festival* – The Festival is a celebration of the horse that brought over 3,000 participants in 2013. This highly educational program targeted K-12 students.
- *How to Wrap Your Horse's Legs Workshop* – This hands-on workshop, offered in 2013 and 2014, demonstrated how to properly wrap the legs of horses for various purposes. A total of five workshops with 89 attendees participated.
- *Horse Judging Clinic* – This clinic teaches attendees (Extension Agents, 4-H leaders, and youth) how to judge both conformation and performance classes of horses. To date over 285 attendees have participated.

Food Science Extension Programs and Activities

Food Safety Regulations for Small Businesses in KY – Extension of Market Ready

Understanding food safety and regulatory requirements is a daunting task for small entrepreneurs who just want to sell their favorite recipes. Depending on where the food is sold, it could be regulated by multiple local, state, and federal regulatory agencies. The UK Food Systems Innovation Center (FSIC) and the Kentucky Small Business Development Center in Louisville recently partnered with the Department of Public Health Food Safety Branch (2015-17) to educate start-up entrepreneurs in Kentucky on local, state and federal regulatory requirements and introduce food safety programs that could help them meet such regulatory requirements.

Faculty and Extension Associates involved with this program include Paul Vijayakumar, Tim Woods, and Alex Butler.

Helping Food Businesses Sell Canned Food Products According to Federal Regulations

The U.S. FDA regulations prohibit marketing shelf-stable acidified and low-acid foods unless the manufacturer's processes are established by a qualified Process Authority. Products which do not satisfy this requirement may be put on probation by U.S. FDA or refused entry for imports. Marketing such products is a prohibited act which can result in criminal and civil penalties,

including imprisonment, fines, injunctions, and seizures. The U.S. FDA requires that scheduled processes for low-acid and acidified foods be established by person qualified as a "Process Authority." A Process Authority must have expert knowledge of thermal processing requirements for low-acid foods acquired through appropriate education, training, and experience. After testing the product and establishing the scheduled process the Process Authority signs an approval letter, which is used by the industry personnel to complete an online form on the FDA website, which is examined by FDA personnel, after which the product can be marketed for sale nationally and internationally. As a certified thermal processing professional and a Process Authority, products for process review and approval were received from all around the United States. Large processing plants have their own Process Authority to test these foods, but small businesses in KY and other states depend on qualified university Extension Specialists to help them. As the Process Authority at the UK FSIC, from 2015-17 I partnered with the department's Food Microbiology Laboratory to test, review and issue process review letters for 216 different products from 32 small businesses clients in KY (32) and 37 clients from five other states (OH, WI, MO, MD, NY). Clients pay for this service (KY clients are charged \$80, and currently out of state clients are not accepted in order to concentrate efforts on KY clients).

Faculty and Extension Associates involved with this program include Paul Vijayakumar and Katherine Akers (Laboratory Technician).

Certifying Food Processors in Hazard Analysis and Critical Control Points (HACCP) – A Cost Effective Food Safety System

HACCP is a risk based food safety system that is mandated by the USDA for companies working with meat-, juice-, and seafood-based products. This course provides participants with an understanding of HACCP methods, such as Food Safety Plan development, record keeping, and verification skills that are needed to produce and sell safe food products. Participants in this certification program include food safety and quality assurance managers, other food safety personnel, food scientists and engineers, and food business owners. Fifty-six participants took this certification program in 2015-17 and successfully completed a post workshop test, which is mandatory to earn a certificate. Participant cost is \$185 for this training.

Faculty and Extension Associates involved with this program include Paul Vijayakumar, Melissa Newman, Gregg Rentfrow, and Leann Slaughter.

Better Process Control School Certification for Kentucky Processors

In compliance with mandatory USDA and FDA regulations for the prevention of health problems from low-acid and acidified canned foods, the UK FSIC offers the Better Process Control School to provide certification to supervisors regarding thermal processing systems and acidification and container closure evaluation programs. The UK FSIC, in partnership with FDA and the KY State Department of Health (DPH) offers the Better Process Control School to provide certification in thermal processing systems and acidification and container closure evaluation programs for small- and medium-sized processors and supervisors from food companies and to help them comply with mandatory USDA and FDA regulations. The DPH Food Safety Branch requires this certification for KY processors and food businesses which intend to sell acidified canned foods at retail chains and grocery stores, especially across state lines. This 2-day training program features an FDA-approved curriculum, and to obtain

certification participants must score at least a 70% in each of the eight post-chapter tests. Sixty small- to medium-sized food processors/food business owners from KY and OH successfully completed the workshop in 2015-17 and obtained the Better Process Control Certification. Participants pay \$225 for this training.

Faculty and Extension Associates involved with this program include Paul Vijayakumar, Melissa Newman, Gregg Rentfrow, and Leeann Slaughter.

Good Agricultural Practices Third-Party Audit Training

Good Agricultural Practices (GAPs) and Good Handling Practices (GHPs) are voluntary audit programs to validate the production, handling, packaging, and storage procedures of vegetable and fruits to ensure their microbial safety. This program is required for farmers trying to sell wholesale to national and international retail chains (such as Walmart and Kroger), and buyers in particular require this from the farmers. GAP and GHP training programs are for farms of all sizes, especially the beginning and small- to medium-scale farmers with limited resources who have difficulty understanding scientific food safety terms, in particular the term “audit”, and hence are hesitant take a forward step to pursue this certification. This program’s focus is to help participants (growers and Extension agents) understand the audit process, teach them to write a farm food safety plan, point participants to available resources, and prepare Extension Agents to serve as consultants for the GAPs and GHPs audit process at the county level. At the end of the workshop, the farms will have a ready to print copy of their farm’s food safety plan that will increase buyer’s confidence and open new markets (farmers market, intermediate store or restaurant buyers, large store or restaurant buyer and schools). From 2015-17 over 50 clientele have participated in this training.

Faculty and Extension Associates involved with this program include Paul Vijayakumar and Bryan Brady (Cultivate Kentucky Extension Associate).

FDA’s Food Safety Modernization Act (FSMA) Preventive Controls Qualified Individual Certification

Through FSMA, FDA requires human food producing facilities to employ preventive measures and develop a prevention based food safety plan to reduce foodborne illness. The rule requires these two tasks to be done by a preventive controls qualified individual (PCQI). According to FSMA, a PCQI is someone who has successfully completed certain training in the development and application of risk-based preventive controls or is otherwise qualified through job experience to develop and apply a food safety system. The UK FSIC provided this intensive certification training to diverse clientele, which included health inspectors/regulators from the Kentucky DPH Food Safety Branch, industry personnel from different food industries in Kentucky, and FSC students. From 2016-17 29 participants successfully completed the 3-day course and obtained PCQI certificates.

Faculty involved with this program include Paul Priyesh Vijayakumar and Melissa Newman.

Produce Best Practices Training (PBPT) Agent In-service Train-the-Trainer Professional Training Program

Kentucky GAP program was revamped by a joint effort between KDA and UK FSIC. This update was necessary to include the latest information and practices from the Federal FSMA Produce Safety Rule implemented by the FDA. In addition, the term GAP has become confusing. When a buyer requires food safety audits, producers have to get GAP certified through a third party, which is different from the GAP training offered for farmers who offer raw samples at farmers markets approved by the Kentucky Department of Agriculture. This diploma program was renamed to help avoid some of this confusion. The new program is called PBPT. The biggest change will be removing the existing video from the curriculum and instead adequately preparing agents to deliver in-person trainings to their producers. This district-based agent in-service involves six hours of trainings, and was initiated in Spring 2017. So far, five trainings have been offered with over 142 Extension Agents being trained. Funding for this program is \$78,166 from a SSARE Professional Development Program grant.

Faculty involved with this program include Paul Vijayakumar and Ravi Jadeja (Oklahoma State University).

Animals in Disasters and Community Emergency Planning/Training (previously named Strengthening Community Agrosecurity Planning, or S-CAP)

A two-day (2013-14) or four-day (2016-17) web-based state animal disaster exercise/training that tested states' abilities to utilize their emergency operation plan to request out-of-state, federal, and non-governmental organization resources. The two-day training involved 24 states and the four-day training involved 17 states. In 2011, a Train-the-Trainer Program for S-CAP was developed, and a S-CAP tabletop exercise with six separate scenarios was also developed. All of these activities were provided in coordination with the U.S. Department of Homeland Security. Funding for these activities included \$119,501 from USDA APHIS and \$72,104 from USDA NIFA.

Faculty and Extension Associates involved with this training were Roberta Dwyer, Melissa Newman, Andrea Higdon (CAFE Emergency Management System Director), Kandi Williams (CAFE Extension), and Janelle Hagar (CAFE Extension).

Food Systems Innovation Center (FSIC)

Locally owned, raised, or processed meats and foods have become extremely popular. More small food processors are capitalizing on this phenomenon. These small food processors have questions on how to produce foods within regulatory requirements, how to start and manage a food business, and how to maintain the safety of their products. The goal of the FSIC is to provide affordable research and development studies, product analysis, and sensory evaluation, which can be required by the USDA and the FDA. While the aforementioned procedures can be accomplished at professional laboratories, many small food producers have difficulty in scheduling their products with professional labs or the costs are too expensive. These limitations often discourage small food entrepreneurs in fulfilling their goals, or they will continue to manufacture foods outside the boundaries of the law. The FSIC provides these services at affordable rates to Kentucky's food producers. When one considers that a single product that

causes harm to human health can destroy the locally produced, Kentucky Proud food movement, it is easy to see the values of services provided by the FSIC to Kentucky's food producers. Funding for FSIC includes \$358,904 from the KY Agriculture Development Board grant. Additionally, since 2011 FSIC has generated over \$160,000 in revenue from services performed for clientele.

Faculty and Extension Associates involved with this program include Gregg Rentfrow, Melissa Newman, Joe O'Leary, Paul Vijayakumar, Tim Woods, and Leeann Slaughter.

University of Kentucky Meat Cutting School (UKMCS)

In the past, meat cutters attended trade schools to learn the art of meat cutting and processed meats. Currently, meat cutters learn from other senior meat cutters on the job; therefore, bad habits and misinformation can be passed on to later generations. The UKMCS began in 2007 to train Kroger meat cutters, but since has expanded to train other retail meat cutters along with meat processors throughout the country. Recently, the UKMCS offers meat cutting demonstrations to county cattlemen's groups, Family and Consumer Sciences extension workshops, food purveyors, county fair goers, and culinary schools. The main goal of the UKMCS is to teach and train proper meat cutting techniques, humane and sanitary slaughter practices, processed meats and sausage making techniques, and proper meat plant sanitation and safety. To date, over 1,300 meat cutters have been trained and over 1,000 clients viewed cutting demonstrations in seven states.

Faculty and Extension Associates involved with this program include Gregg Rentfrow, Zee Prasovic, and Brock Billingsley

Farm to Campus

There is an increase interest and push for local products in school systems, and UK is constantly looking for more ways to increase sustainability. Aramark was awarded the campus dining contract thus creating UK Dining. Part of the contract was to continue to evolve and increase spending on locally produced, Kentucky Proud products. The Kentucky Beef Council would like more local beef to be sold in UK eateries and restaurants throughout campus. The major challenge with local products including local animal proteins is costs. Local foods/meats demand a higher price point which is a challenge for a company that relies on positive profit and loss reports. Local ground beef appears to be the most desirable form for UK Dining to utilize in campus facilities. To ensure that we are going to supply UK Dining with a ground beef patty that works for the system, we are evaluating need/want/desire for local foods and local ground beef, as well as experimenting with different forms of ground beef through taste panels to determine the most desirable hamburger. Thus far, 30 UK students and 5 Kentucky beef farmers have been involved in this project, and The Food Connection @ UK has provided \$5,000 in funding to support the project.

Faculty and Extension Associates involved with this program include Gregg Rentfrow, Zee Prasovic, and Brock Billingsley in coordination with the Kentucky Cattlemen's Association and The Food Connection @ UK.

Hazard Analysis and Critical Control Points (HACCP) Trainings

A HACCP plan is a mandatory program that requires extensive recordkeeping for all meat products sold under USDA-FSIS inspection. Any employee that signs and/or monitors meat products within a HACCP plan must be HACCP trained according to requirements of the USDA-FSIS. To date 60 food processors have been trained.

Faculty and Extension Associates involved with this program include Gregg Rentfrow, Melissa Newman, Paul Vijayakumar, and Leeann Slaughter.

Kentucky Association of Meat Processors

Most states throughout the country have meat processor associations. Kentucky's association disbanded in the mid 1980's due to lack of leadership and academic support. Reorganizing the meat processors has been a long-term goal since I arrived at UK over 10 years ago. A general training session involving humane handlings, processed meats, and the benefits of environmental testing was held in July 2016. The workshop ended with the meat processors discussing reforming the Kentucky Association of Meat Processors. The meat processors in attendance voted unanimously to reorganize and elected Jerry Boone and Justin Hampton as the President and Vice President, respectively. I agreed to be the technical advisor and the executive secretary. Currently, I am writing the by-laws and relying on Aleta Blotts at KCARD to help with the legal aspects of developing an association. We have full support from the American Association of Meat Processors, the Indiana Association of Meat Processors, and the Illinois Meat Processors Association. This endeavor currently involves 28 meat processors from 15 family owned meat-processing plants.

The faculty member involved with this program is Gregg Rentfrow, in coordination with the KY Department of Agriculture and the KY Center for Agriculture and Rural Development.

4-H/Youth Food Science Programs and Activities

Gregg Rentfrow provides leadership and coordination for all of AFS's 4-H/Youth food science events and activities. These include events and activities that are regional, statewide, and national in scope. A listing of these include:

- *4-H Country Ham Project* – The 4-H Country Ham Project began with just 32 4-Hers in the late 1990's and has grown to over 775 youth from 68 counties throughout Kentucky in 2017. This project is the second largest non-livestock project in the state, second only to shooting sports. The 4-H members will cure two hams in January and February, clean and re-hang the hams in May, and then choose one of two hams for competition at the Kentucky State Fair. In addition, youth must give a three to five minute speech on the featured topic of the year. Support for this project includes \$30,000 in donations from the Clifton Foundation.
- *Kentucky 4-H Meats Judging Contest* – The 4-H Meats Judging Contest allows youth to evaluate and rank classes of four carcass, wholesale cuts and retail cuts (beef and pork), as well as identify 30 retail cuts and present two sets of oral reasons.

Livestock Forages Extension Programs and Activities (Master Grazer and Grazer 300 Programs)

The Master Grazer Program was recently renamed the Grazer 300 Program, and encompasses a number of individual programs that are outlined below. Donna Amaral-Phillips, Jeffrey Lehmkuhler, and Dr. Ray Smith (Plant and Soil Science) coordinate these programs. Several other faculty (Roy Burris, Garry Lacefield [Plant and Soil Science from 2011-16], Chris Teusch [Plant and Soil Science beginning in 2017], Jimmy Henning [Plant and Soil Science beginning in 2017], Michelle Arnold [Veterinary Science], and Greg Halich [Agricultural Economics] and Extension Associates (Kevin Laurent, Zach Workman, Austin Sexten, Jacob Brandenburg, Kelly Prince) are or were previously involved in these programs.

Funding in support of these programs includes \$213,650 for program support and approximately \$175,000 in Extension Associate salaries in grants from the KY Governor's Office of Ag Policy.

Kentucky Grazing School

A two-day, intensive grazing school is offered to introduce key grazing concepts and provide hands-on learning opportunities. Half of the program is classroom sessions focusing on implementing improved grazing management practices for increased forage and animal production. The remaining portion focuses on hands-on learning activities and discussions related to multiple forage and grazing demonstrations. The KY Grazing Schools continue to be very popular, and for 2011-17 a total of 10 schools with 301 participants were held.

Advanced Grazing School

Advanced Grazing Schools are for individuals who have attended previous grazing programs and those seeking additional educational programs related to managed, rotational grazing. This program consists of topics, tours, demonstrations, and hands-on activities illustrating forage and cattle management concepts and on-going research in grazing. Education focusing on more in-depth forage and grazing management options are covered to continue to enhance production per unit of land. Since 2012, approximately 250 individuals have participated.

University Undergraduate Student Kentucky Grazing Schools

This 2-day program is designed to teach undergraduate students how to design and implement a rotational grazing system, and introduce them to various methods of extending the grazing season. These programs were held on April 7-8, 2015 and November 1-2, 2016 at the ECU Meadowbrook farm in Richmond, KY. This event was attended by a total of 43 undergraduate students.

UK Grazing News (Newsletter)

UK Grazing News is a publication that is distributed to past participants of the KY Grazing School, those attending various workshops sponsored by the Master Grazer Program, individual sign-up via the Master Grazer Website, and to all KY Agricultural Extension Agents. These newsletters provide information to farmers about implementing grazing practices as well as educational tips. The publication is distributed electronically and physical copies are mailed to individuals who request them. Since 2011, it has been distributed to 2,790 individuals.

Master Grazer Website

The Master Grazer website (<http://www2.ca.uky.edu/grazer/>) contains all published articles and other educational materials and links to upcoming educational programs.

Grazing Networks

The long-term goal for the Grazing Networks was to obtain local, community-based support for managed grazing. It was anticipated that like-minded individuals would come together and request assistance in developing a local grazing network similar to those in other states to further provide educational resources and programs related to grazing management. In 2011 and 2012, we fostered the start of a couple networks to see if they would take hold and continue beyond our support. They did not continue as hoped, so this program was not continued.

Master Grazers DVD

The Master Grazer DVD captured the educational program for those who could not attend an educational event and shows all of the various events for educational purposes. It is designed to be used by Extension Agents and other educational instructors. The video is a resource can be share with those seeking information regarding managed grazing.

Grazing for Cash

The goal of this program was to provide producers with information to save money on seasonal expenditures by extending the grazing season. By decreasing the reliance on stored forages by grazing livestock and/or improved management of forages grazed or fed, the profitability of livestock enterprises can be improved. This program served as a foundation program from which other educational programs were developed.

Regional Field Days – Tweaking your Grazing System

Program designed to help producers increase utilization of forages currently on their farm as it relates to spring and fall management practices. The eastern region had an attendance of 135 participants and the western regional program had 75 participants between the years of 2013-2014.

Grazing Notebook

A notebook was created in 2014 to record rotational grazing practices as applied to individual pastures to aid in making management decisions in the future.

Lengthening the Grazing Season

This program was designed to reach producers who cannot attend our KY Grazing School or other statewide programs. One day or evening short courses are held in different regions of the state to allow producers access to these programs close to home. Programs consisted of multiple topics related to managed, rotational grazing to extend the grazing season. The number of attendees in 2015 was 80, and in 2016 there were 125 participants.

Grazing and Pasture Timely Tips Videos

These tips are formatted as videos and the first of these were released in early 2017. The videos are short instructional pieces designed to be readily available on the Master Grazer website.

Grazing Demonstrations and Associated Educational Programs

The goal of these demonstrations is to illustrate to producers how to reduce their reliance on stored forages, improve management of forages grazed or harvested, and increase the profitability of livestock enterprises. Ideally, these educational programs are divided into two sessions, but in some locations, sessions 1 and 2 are combined into one program. During session 1, producers learn about a topic area and see first-hand how to incorporate practices associated with that topic. During session 2, producers will see the results from the practice implemented during Session 1. Participants in 2016 numbered 21, and participants in 2017 were nine.

Poultry Extension Programs and Activities

Approximately \$975,566 in funding has been generated to support the poultry extension programs and activities.

Commercial Poultry Programs

Poultry is the number one agricultural commodity in the state with an annual value of over \$1.2 billion. During the period in the review the focus of the commercial poultry program centered on four areas (1) energy usage, (2) environmental issues including siting guidelines for new and expanding farms, (3) Avian Influenza preparedness including biosecurity programs, and (4) the transition of nontraditional poultry farms from small to medium sized operations.

The Grower Education Program and Poultry House Energy Evaluation program was funded by Kentucky Ag Development Board in the amount of \$825,000 (UK subcontract \$395,566). These funds were used to evaluate the energy usage on poultry farms, fund the salary of an Extension Associate in AFS, and fund a newsletter and grower education meetings.

Environmental issues and siting guidelines continue to be an issue as hundreds of new houses have been built the Commonwealth. Three new companies producing pasture poultry have located into Kentucky that were unfamiliar with Kentucky regulations. Siting requirements on new farms require outreach efforts to prevent future issues with communities and neighbors.

Avian Influenza preparedness and response plans needed to be developed. Working with the Kentucky Poultry Federation, State Veterinarian and the Kentucky Poultry Disease Advisory Committee, an Avian Influenza response plan was developed and had to be activated for two incidences.

The nontraditional poultry operations have entered a new phase of production. As these operations expand in size so does the quantity of information and need for assistance. Direct contact, webinars and farm visits have been use to distribute information.

The faculty member and Extension Associate involved in this program are Anthony Pescatore and Jacqueline Jacob.

Small Poultry Flock Programs

Small flocks are a rapidly growing segment of poultry. Outreach efforts have included the

creation of a web site (<http://www2.ca.uky.edu/smallflocks/>) that provides a portal to all of the related publications. The University of Kentucky provides the leadership for the eXtension poultry website including facilitating monthly webinars. Annual outreach through these websites include 969,457 visits to eXtension and 20,107 visits to the small flocks' web site. Direct contacts to small producers remain an important component of the outreach program.

The faculty member and Extension Associate involved in this program are Anthony Pescatore and Jacqueline Jacob.

4-H/Youth Poultry Programs and Activities

Anthony Pescatore and Jacqueline Jacob provide leadership and coordination for all of AFS's 4-H/Youth poultry events and activities. These include events and activities that are regional, statewide, and national in scope. A listing of these include:

- *4-H Poultry Judging* – Poultry judging is a tool used to develop 4-H club members. Participation in judging and other competitive events helps 4-H'ers learn to make and defend decisions and to speak in public. Poultry judging provides an excellent opportunity for 4-H'ers to learn about live birds and the basis of grade and quality of poultry products.
- *Egg Preparation Demonstrations* – Participants in the Egg Preparation Demonstration Event are required to prepare a dish containing eggs demonstrating proper food safety and cooking skills. The Kentucky 4-H Egg Preparation Demonstration Event, which is held in conjunction with the Kentucky 4-H Communication Day, has contests for both juniors and seniors. The senior winner in Egg Preparation will represent Kentucky at the National 4-H Poultry and Egg Conference which will be held in Louisville on the third Thursday of November. They will be provided with \$300 to cover travel expenses related to participation in the national event.
- *4-H Poultry (Chicken and Turkey) Barbecue Camps/Contests* – In the Chicken Barbecue Contest participants have 2½ hours to barbecue three chicken halves. They are judged on their cooking skills and the participants submit two of the halves for sensory evaluation. In the Turkey Barbecue event participants have 3 hours to barbecue two turkey breast fillets. Again, they are judged on their cooking skill and the participants submit one of the turkey breasts for sensory evaluation. The senior winner(s) at the Chicken/Turkey Barbecue events will be given the opportunity to represent Kentucky at the National 4-H Poultry and Egg Conference which will be held in Louisville on the third Thursday in November. They will receive \$300 each to cover travel expenses to participate in the national event. Expansion of the BBQ camp programs have been used by agents to meet their programing needs in SNAP.
- *Avian Bowl* – This is a double-elimination knowledge contest based on poultry-related subject matter. Its objectives are (1) to encourage youth to expand their knowledge of avian facts, and become proficient in poultry management, and related subjects, (2) to help youth with career guidance, and to promote the poultry industry, by stimulating their interest in poultry and other avian species, and (3) to make learning fun. The top four senior judges will have the opportunity represent Kentucky at the National 4-H Poultry Conference to be held the third Thursday of November in Louisville.

- *Embryology and Incubation Projects* – These projects provide a way for 4-H'ers and classroom students to incubate and hatch chicken eggs.
- *Trainings and Educational Opportunities* – Area trainings have been conducted in the state to increase participation in the 4-H/youth poultry programs. In-service trainings have been conducted for agents and leaders. Expanded resources for agents and leaders have been developed and are available on the agent resource page.
- *Poultry Judging CD* - A comprehensive training CD on poultry judging has been developed and has been offered for sale nationally.
- *National 4H Poultry and Egg Conference* – UK personnel provides leadership for this conference and maintains the web site of the national conference.

Sheep and Small Ruminant Extension Programs and Activities

Small Ruminant Profit School

The Kentucky Ag Development Board, the American Sheep Industry, and the National Sheep Industry Improvement Center provided funds in 2014 to the Kentucky Sheep and Goat Development office to establish the Small Ruminant Profit Schools (SRPS) for new and prospective sheep and goat producers. Objectives were to improve the support system for new and existing producers by creating a network of mentors for the industry as well as developing an intensive educational program. UK, Kentucky State University, and the Kentucky Department of Agriculture developed materials and taught 30 hours in five sessions each in 2014 and 2015. The SRPS had 103 participants and 21 mentors complete the courses in 2014 and 2015. Sheep numbers in Kentucky have increased 40% since 2013. Goat numbers have increased 9%. Changes seen in the small ruminant industry include: (1) A rapid growth in the hair sheep inventory, (2) Increased numbers of healthier animals at the marketplace, and (3) Less loss from newborn small ruminants.

The faculty member involved in this program is Don Ely.

Eweprofit Schools

Three Eweprofit Schools are held annually and are designed for both new and prospective sheep producers as well as experienced producers. The three schools are designed to provide the inexperienced producer with the skills necessary to efficiently manage a sheep flock on an annual basis. Through discussion, demonstration and hands-on experience the following topics are covered: internal parasite control, foot care, body condition scoring, vaccination programs, ewe/ram management, lamb production, ration/feeding programs, equipment, marketing and forage management. Approximately 20 producers attend each school.

The faculty member involved in this program is Don Ely.

Sheep Shearing School

The annual Shearing School is conducted in late March by professional sheep shearers and University of Kentucky personnel. The objective of the school is to train new and prospective producers to efficiently shear their own sheep. Each two-day school emphasizes equipment care and use, handling shears, handling sheep and the actual shearing process.

The faculty member involved in this program is Don Ely.

Lambing School

The Lambing School is held annually during the peak lambing season and is designed for new and prospective producers. Clientele have the opportunity to work with ewes that are lambing in order to hone in their skills to have a successful lambing season. Topics covered include preparation of lambing facilities, observation of signs of parturition, and the care and feeding of ewes prior to and after lambing. In addition, husbandry practices for the new lambs are covered.

The faculty member involved in this program is Don Ely.

Swine Extension Programs and Activities

The Swine extension programs and activities listed below are those that occurred during 2011-2014. Beginning in 2012, the department's Swine Extension Specialist (Richard Coffey) became the Director of the UK Research and Education Center in Princeton (which was a 50% administrative appointment) which limited extension activities to 50% FTE. Additionally, in 2015, the department's Swine Extension Specialist (Richard Coffey) became Department Chair for AFS, and the Swine Extension Specialist position has not yet been filled.

In addition to swine extension activities, the Swine Extension Specialist (Richard Coffey) served as the department's Youth Programs Coordinator during 2011-14 of this review period. In this role the Specialist was involved in numerous programs and activities including Co-Coordinator of the Kentucky 4-H Livestock and Horse Volunteer Certification Program, Coordinator of the Kentucky 4-H/FFA Youth Market Animal Projects Validation Program, and Coordinator of the Kentucky KY 4-H/FFA Breeding Animal Project Nomination Program. Additionally, the Specialist provide oversight for the Kentucky 4-H Livestock Judging Contest, Kentucky 4-H Livestock Skillathon Contest, and training of the Kentucky 4-H Livestock Judging Team. These activities are more fully described in the 4-H/Youth Livestock Programs section of this review document.

Personal Consultations

A majority of today's swine operations are fairly large and, in many cases, involved in specialized production (i.e. gilt multiplier, farrow-to-wean, contract nursery, and wean-to-finish or finishing), with the swine enterprise being the predominant source of revenue for the farm. Also, swine operations have become more complex and efficiency-minded and have adopted fairly technical management practices and production strategies. To meet their unique individual needs, pork producers desire and demand personal contact with an individual who has the technical expertise and resources to assist them in their farm specific decision-making and problem-solving processes. Because of this, one-on-one consultations that provided farm specific technical information and assistance in all areas of pork production (production flow and efficiency, management, health and disease, environmental sustainability, marketing, pork quality, facility construction or remodeling, and trouble-shooting) were provided. These personal contacts (monthly averages of 29 phone consultations, 20 printed responses [letter, fax, e-mail], 12 office or face-to-face consultations, and four farm visitations) were with producers, county agents, support industry personnel, government agencies, and professionals involved with

the swine industry. A large amount of these personal consultations dealt with issues related to high feed and other input prices (alternative ingredients, more efficient production practices, optimal market weights, input purchasing strategies, marketing strategies, etc.) and manure management issues (capturing the true fertilizer value of manure, development of Comprehensive Nutrient Management Plans, manure storage/treatment options, etc.).

Pork Quality Assurance Plus (PQA) Program

The PQA Plus Program involves producer educational certification training by a trained and certified PQA Plus Advisor and an objective assessment of on-farm animal care and wellbeing. All U.S. packers have been requiring all pork producers from whom they purchase hogs to complete the certification. Starting in mid-2009, a majority of U.S. packers began requiring producers to have site assessments conducted on their farms. I serve as the State Trainer for the PQA Plus Program in Kentucky, and in this role, I am responsible for providing oversight of the program, training PQA Plus Advisors, conducting certification trainings for producers, and conducting site assessments. For 2011-14, approximately 45 PQA Plus advisors were trained and approximately 350 pork producers in Kentucky and Tennessee received their certifications. Additionally, on-farm site assessments were conducted on 37 farms in Kentucky and 33 farms in Tennessee.

Applied Research

Applied research projects are an important part of swine extension programming. Specific projects during 2011-14 included (1) development and evaluation of a novel, high-rise swine facility that utilizes within-the-animal-facility composting for manure management and (2) evaluating various types of composting systems that utilize various liquid-solid separators for manure. Approximately \$227,000 in funding supported the applied research efforts.

4-H/Youth Livestock Programs and Activities

The faculty and Extension Associates involved in 4-H/Youth Livestock (beef goats sheep, swine) Programs and activities during the review period included Richard Coffey (2011-14), Jason P'Pool (2011-13) and Steve Austin (2014-17).

- *Kentucky 4-H Livestock and Horse Volunteer Certification (KLHVC) Program* – This important program was initiated in 2005 for livestock volunteers, with horse volunteers being included in 2010. The goals of the program include (1) ensuring that all youth and Volunteer Leaders have access to high quality, comprehensive materials, regardless of county resources, (2) ensuring a sound and well-rounded educational experience for youth enrolled in livestock and livestock-related projects, and (3) empowering Volunteer Leaders to successfully lead a club in a fun, interactive environment. All counties that providing livestock and horse programming are required to have at least one Certified Volunteer Livestock Leader (CVLL) or Certified Volunteer Horse Leader (CVHL). Volunteers become certified by attending a 1-1/2 day KLHVC Workshop, with two workshops being held annually. Over 350 CVHL from 87 counties and over 950 CVLL from 110 counties have been certified.
- *Kentucky 4-H Livestock Judging Program* – The Kentucky 4-H Livestock Judging Program is a valuable educational experience for Kentucky's youth. While youth gain

considerable knowledge about various aspects of livestock evaluation through their participation in this program, the important life skills these youth learn through participating are the real hallmark of the Livestock Judging Program. Youth develop character and learn the value of the hard work and preparation that it takes to be successful, and develop decision-making and communication skills that will stay with them for a lifetime. In addition, the friendships these youth make with others from different areas of the state are those that will remain with them throughout their lives. The Kentucky 4-H Livestock Judging Contest is held annually as a part of this program, and involves approximately 300 4-H participants each year.

- *Top 12 Week* – Each year, the top 12 overall placing 4-H youth in the Senior Division at the Kentucky 4-H Livestock Judging Contest qualify to attend Top 12 Week. Youth attending Top 12 Week receive one week of intense training in evaluation of beef cattle, goats, sheep, and swine, as well as training in preparing and giving oral reasons. During Top 12 Week youth will travel across Kentucky and parts of Indiana to visit 12-15 elite livestock operations to evaluate their livestock. During a typical Top 12 Week, youth will evaluate 50-60 classes of livestock and will give 25-30 sets of oral reasons. Despite this rigorous schedule, plenty of time is also set aside for youth to socialize with each other and to participate in some fun activities. Top 12 Week is great time for youth to improve their livestock judging and oral reasons skills, and to interact with other youth from different parts of Kentucky. In addition, the network of breeders and livestock producers the youth will interact with during Top 12 Week will bear fruit for years to come.
- *Kentucky 4-H All-Star Livestock Judging Team* – At the conclusion of Top 12 Week, eight youth are selected to be a part of the Kentucky 4-H All-Star Livestock Judging Team. These eight youth will receive additional training in evaluation and oral reasons throughout the Fall. Additionally, these eight youth participate in several regional/national livestock judging contests, which typically includes the AKSARBEN Livestock Exhibition (Omaha, NE), Keystone International Livestock Exposition (Harrisburg, PA), Purdue University Boilermaker Practice Contest (West Lafayette, IN), and Premier Stockman Livestock Judging Contest (Auburn, IN). Following the Premier Stockman Livestock Judging Contest, four youth are selected as the Kentucky 4-H All-Star Gold Livestock Judging Team. These four youth have the honor of representing Kentucky at the National 4-H Livestock Judging Contest which is held each November as a part of the North American International Livestock Exposition in Louisville, KY.
- *Kentucky 4-H Livestock Skillathon Program* – The Kentucky 4-H Livestock Skillathon Program provides a valuable educational experience for youth. The content of this program provides a framework for youth to learn a variety of topics related to the production and management of beef cattle, meat goats, sheep, and swine. Participants in this program learn about different breeds of livestock, external parts of livestock, skeletal anatomy of livestock, feedstuffs used in livestock diets, equipment using in raising and showing livestock and in processing meat, wholesale and retail cuts of meat derived from livestock, expected progeny differences (EPDs), common calculations used to measure animal performance and profitability, judging hay, judging meats, and judging performance classes of livestock. The Kentucky 4-H Livestock Skillathon Contest is held annually as a part of this program, and involves approximately 250 4-H

participants each year. The senior age county team that wins the statewide contest qualifies to represent Kentucky at the National 4-H Livestock Skillathon Contest.

- *Kentucky 4-H/FFA Market Animal Validation Program* – The 4-H/FFA Market Animal Validation Program helps to ensure the integrity of the market animal program. The goal of the program is to document ownership and youth participation by tagging all market steers, market lambs, market goats, and market swine with an R.F.I.D. tag that serves as the Kentucky Uniform Identification Program (K.U.I.P.) tag, taking tissue samples from each tagged animal for DNA identification, and identifying the location where each market animal will be housed. All market steers, market lambs, market goats, and market swine that will be exhibited at Kentucky Department of Agriculture (KDA) shows and (or) the Kentucky State Fair must go through the validation process. Over 1,400 youth participate annually in market animal projects, and 3,000 market animals are validated annually.
- *Kentucky 4-H/FFA Breeding Animal Nomination Program* – The 4-H/FFA Breeding Animal Nomination Program helps to ensure the integrity of the breeding animal program. The goal of the program is to document ownership and youth participation by documenting breed, identification (ear notch, tattoo, tag, etc.), and identifying the location where each market animal will be housed. All breeding heifers and bulls, breeding ewes, breeding does, and breeding gilts that will be exhibited at Kentucky Department of Agriculture (KDA) shows and (or) the Kentucky State Fair must go through the nomination process. Over 500 youth participate annually in breeding animal projects, and over 2,000 breeding animals are nominated annually.
- *Kentucky 4-H/FFA Market and(or) Breeding Animal Projects* – Market and breeding animal projects provide youth with opportunities to expand their knowledge of animal industries, production and, more importantly, develop the life skills that are needed to be positive contributors to society. Through livestock projects youth will learn about selection and evaluation, nutrition and feeding, health and daily care, reproduction, marketing, and much more. Youth learn to accept responsibility, to value hard work, think critically, make decisions, and communicate. Livestock projects provide a great avenue to meet and develop friendships with other youth and leaders from across the state. Young people are also able to connect with supportive adults (who serve as mentors), demonstrate a commitment to learning, develop social competencies and gain exposure to career opportunities.
- *Youth Educational Trainings and Presentations* – A variety of educational trainings (presentations, workshops, demonstrations, etc.) on a diversity of livestock topics are provided at the county, regional, and state levels.

NOTE: Youth activities specific for other programming areas (beef, dairy, equine, food science, and poultry) can be found in their respective sections of this document.

Extension Publications and Educational Resources

Table 37 provides a summary of publications and other educational resources developed by extension personnel. A complete listing of the extension publications and educational resources can be found in **Appendix JJ**.

Publication or Educational Resource	Number
Fact Sheets	103
DAIReNET	20
Other Extension Publications	70
Educational Videos	38
Educational Presentations	2
Decision Support Tools	4
Electronic Resources (Apps, USB-based, web-based, etc.)	4
Proceedings	7
Book Chapters	4
Refereed Journal Articles	58
Abstracts	12
Invited Papers	2

Extension Faculty and Staff Awards and Recognitions

During 2011-17, 13 extension faculty and staff faculty in AFS have received a combined 24 major awards for their respective programs and activities. These awards, listed below, include college, state, regional, and national level awards. Please note that these are extension-related awards only and do not include teaching and research awards, which are included in other sections of this document.

National Level Awards

- 2011 American Meat Science Association Achievement Award – Gregg Rentfrow
- 2015 American Society of Animal Sciences Extension Award – Darrh Bullock
- 2015 Poultry Science Association Phibro Extension Award – Tony Pescatore
- 2017 American Society of Animal Sciences Animal Industry Service Award – Darrh Bullock

Regional Level Awards

- 2011 Southern Section American Society of Animal Science Extension Award – Richard Coffey
- 2014 Southern Section American Society of Animal Science Extension Award – Les Anderson
- 2014 Midwest Section American Society of Animal Science Outstanding Extension Award – Gregg Rentfrow
- 2016 Southern Section American Society of Animal Science Extension Award – Jeff Lehmkuhler
- 2016 Eastern Nationals 4-H Horse Roundup Outstanding Service Award – Fernanda Camargo

State Level Awards

- 2011 Kentucky Cattlemen’s Association Outstanding Service to Kentucky’s Beef Industry – Gregg Rentfrow
- 2011 Honorary State Farmer Degree – Richard Coffey
- 2014 Kentucky Forage and Grassland Council State Public Award – Kevin Laurent
- 2014 Honorary State Farmer Degree – George Heersche
- 2015 Kentucky Pork Producers Association Hall of Fame – Richard Coffey
- 2016 Kentucky Pork Producers Association Associate Member of the Year Award – Gregg Rentfrow

College Level Awards

- 2011 Kentucky Association of State Extension Professionals Outstanding Project – Tony Pescatore and Jacquie Jacob
- 2011 Kentucky Association of State Extension Professionals Outstanding Extension Associate Award – Jacquie Jacob
- 2012 Kentucky Association of State Extension Professionals Outstanding New Extension Faculty – Jeffery Bewley
- 2014 Kentucky Association of State Extension Professionals M.D. Whiteker Award for Excellence in Extension – Tony Pescatore
- 2015 Kentucky Association of Agricultural and Natural Resources Agents Outstanding Extension Specialist Award – Les Anderson
- 2016 College of Agriculture, Food and Environment Extension/Research Impact Award – Roy Burris
- 2016 Kentucky Association of State Extension Professionals M.D. Whiteker Award for Excellence in Extension – Les Anderson
- 2017 Kentucky Association of State Extension Professionals M.D. Whiteker Award for Excellence in Extension – Gregg Rentfrow
- 2017 Kentucky Association of State Extension Professionals Outstanding New Extension Faculty – Paul Vijayakumar
- 2017 Kentucky Association of State Extension Professionals Outstanding Extension Coordinator – Tony Pescatore

Extension Accountability Measures

As a part of college, state, and federal accountable measures for extension personnel, AFS's extension faculty and staff are required to document and report the number of days they are involved in extension programming/activities and the number of contacts they make with their programs and activities. For 2011-17 AFS extension faculty and staff reported a total of 28,180 days involved in extension programming/activities, and 547,323 total contacts with clientele. A detailed summary of reported days and clientele contacts is in **Appendix KK**.

Extension faculty and staff are also required to provide Impact Statements (also called Success Stories) for major programs and activities. For 2011-17, AFS's faculty and staff provided 183 Impact Statements. A listing of these is in **Appendix LL**.

Major Limitations/Challenges/Needs

AFS extension faculty and staff have maintained a high level of productivity, despite several challenges. Some of the immediate challenges, if not effectively addressed, will negatively impact productivity and the quality of programs and developed resources. The following are major constraints for extension:

- Funding – Both state and federal funding for extension activities continue to decline. Similar to most departments in CAFE, a vast majority of the department's budget earmarked for extension is targeted for salaries of faculty and staff. This leaves little operating dollars for extension programming and travel associated with extension

activities. This has placed pressure on extension personnel to seek outside funding to support their extension efforts. This at times gives clientele the impression that we do programs and activities for which we can find funding, which might not always be the programs and activities that they (and we) feel would be the most impactful. Additionally, this has created a need for some Extension Associate positions being soft funded (i.e., on grants).

- Faculty numbers – Several factors have resulted in less FTEs being devoted to department’s extension mission. First, budget constraints have resulted in the loss of extension faculty lines, or extension positions that remain unfilled (i.e., the Swine Extension Specialist position has been open since Richard Coffey became Department Chair in 2015). Second, increases in undergraduate student numbers coupled with decreasing faculty FTEs devoted to teaching has resulted in extension faculty being asked to provide assistance to the undergraduate teaching mission.

Appendix A

Program Review
Implementation Plan
Progress Reports

APPENDIX A

PROGRAM REVIEW IMPLEMENTATION PLAN PROGRESS REPORT Animal and Food Sciences October, 2014

1. Enhance and increase regular communication with commodity groups and stakeholders.

Assessment method: Departmental commodity coordinators will individually evaluate the best ways to communicate with their commodity groups.

Results: Each commodity group already had a Farm Bureau Advisory Committee and a commodity organization board with a departmental representative (chair or faculty member) that sits on the committee or board. Thus the communication with each commodity group is best served by reporting through those groups. In addition, the Dairy Program held a UK Dairy Research Showcase, inviting members of the dairy commodity group to presentations by students. All commodity groups, KY Farm Bureau, and KY Department of Agriculture were invited by the college to an Animal and Food Sciences Forum to discuss the search for a new department chair and provide input. The Kentucky Beef Network is an example of a direct partnership between UK and the KY Cattleman's Association.

Analysis of results and reflection: Since each commodity group represented has interests and issues that are unique to their group, the department decided that the existing advisory committees or commodity organizations are logical venues to discuss departmental challenges and programs. This has been an effective way to give annual updates.

Ongoing improvement actions: The department will continue to communicate with stakeholders and commodity groups through the existing advisory committees or commodity board. This allows for one-on-one interaction with the groups. Some departmental commodity groups might discuss additional options similar to the Dairy Research Showcase to update groups on research activities.

2. Develop strategies to expand the delivery of distance learning, on-line courses, and virtual classroom concept.

Assessment method: *This was rejected in the Implementation Plan due to lack of departmental faculty and budgetary resources.*

3. Explore how faculty can be certain to receive performance credit for all major activities.

Assessment method: During 2014 performance evaluations, faculty will confirm DOE and clearly document activities, accomplishments, and impact.

Results: The 2014 performance evaluation process is currently in progress. The chair will remind faculty to document their activities and accomplishments in their CV and will also remind evaluation committees to emphasize these accomplishments during performance evaluations.

Analysis of results and reflection: Clearly some faculty members do not feel they are rewarded during performance reviews for the efforts they put forward. However, the college has clear guidelines for calculating teaching DOE and the faculty use those guidelines when they turn in their DOE. The department will make greater efforts in referring to the Evidences of Activity for the department, so faculty clearly understand what defines rewarded accomplishments in teaching, research, and Extension.

Ongoing improvement actions: The department will continue to make every effort to give credit to faculty for their efforts and accomplishments during performance reviews, as outlined in the Evidences of Activity. The performance evaluations utilize faculty committees, including the chair, who review the documentation provided by each faculty member.

4. Explore how faculty and departmental leadership can expand collaborative projects and opportunities with other units.

Assessment method: The UK Research Sponsored Project reports will be monitored for collaborative grants. In addition, the chair will work with CAFE administration to monitor and identify potential collaboration and partnerships.

Results: In FY 2014, the department faculty were PI's on \$3,360,088 in grants that involved collaboration with other departments or other universities. In addition, department faculty were co-PI's on \$949,799 in grants on which faculty outside the department were the PI.

Analysis of results and reflection: Upon analysis of the grants that the department receives, 83% of the funding involves collaboration with professionals outside the department or with other universities. The department has done an excellent job of establishing and taking advantage of collaborative arrangements or partnerships. In addition to collaborative grants, other examples of collaboration include the Food Connection (with Aramark), Extension activities through the Kentucky Beef Network, Extension programming across departments, and the Butcher Shop partnership with Dining Services.

Ongoing improvement actions: The chair and faculty will continue to communicate with CAFE administration, as well as the UK Director of Corporate Partners, to identify opportunities for collaboration. The chair will distribute to the faculty any appropriate grant opportunities and deadlines that are identified via listserv, Grants Bulletin, or other sources.

5. Develop a plan for a facility and classroom improvement initiative.

Assessment method: Departmental and CAFE project records will be reviewed annually and compared with a list of facility needs compiled by the chair from faculty/staff input and personal observation of the physical plant.

Results: In 2013-2014, Lab N-11 Ag North was completely renovated to make a modern anatomy lab with stainless steel, portable tables and complete computer/flat screen capabilities. In 2013, the Garrigus 109 classroom was completely renovated by UK. Teaching Labs 104, 105, and 106 were upgraded to electronic classrooms in 2013, along with new lab stools and furniture in 105, using CAFE and departmental funding. A new sitting-height lab bench is slated for installation in 104 when funds are available in the college. In 2014, classroom 108 was completely renovated by UK. Also in 2014, a new Mosdal feeding system was purchased for the Swine Unit, the HVAC system in the Intensive Research Building at the Beef Unit was upgraded, a new mixer wagon was purchased for the Dairy Unit, new trucks for Swine and Horse Units were purchased, and a new ultracentrifuge was purchased through CAFE funds. A new feed mill is under construction at the Little Research Center (LRC) in Woodford County, KY with a projected completion date in March, 2015. Bids are to go out in October for a new Compost Bedded Pack Barn at the Dairy.

Analysis of results and reflection: Significant progress has been made in upgrading classrooms in Garrigus Building. All the classrooms have now been improved and the anatomy lab (N-11) is heavily used. Some of the urgent farm facility and equipment needs have been met and new construction projects are underway. LRC facilities are approaching 15 years since construction and infrastructure needs are being identified.

Ongoing improvement actions: The chair will continue to survey faculty/staff for the most critical issues that hinder productivity of the research and teaching programs. Personnel are encouraged to identify pending facility and equipment deficiencies so we can plan for the future.

6. Work with CAFE administration to simplify business and accounting practices.

Assessment method: The chair will monitor and provide input on proposed new business practices through the CAFE Chairs meetings and Dean's Administrative meetings, with the objective of relieving the workload of faculty, yet maintaining appropriate financial oversight.

Results: Over the past 10 years, it appears that the amount of paperwork required of faculty has increased, hindering their ability to perform their academic responsibilities. The chair has actively discussed and been opposed to any new proposals that increased faculty paperwork, but had no positive impact on productivity. Where new approval forms have been implemented, we have tried to use electronic signatures if possible so approvals can be given outside the office.

Analysis of results and reflection: Although the department can be proactive in guarding against increased paperwork for faculty, the reality is that we have very little control over implementation of new university policies. The move toward more online business procedures may reduce paper on the one hand, but may increase the need for faculty or other supervisors to be more vigilant at checking email or Enterprise Services for actions that they must take. I believe we are adjusting to the online environment.

Ongoing improvement actions: The chair and faculty will continue to be vigilant of changes in business procedures and evaluate the most efficient and time-saving methods to address the new procedures.

7. Consideration must be taken of the balance between a species and discipline approach for teaching/research. This is critical to the continued success of the department.

Assessment method: The department will seriously discuss and evaluate the balance of species and discipline emphasis in the department programs when hiring new faculty and as we review the curriculum.

Results: The position description for an Animal Science faculty position recently did not include a specific species emphasis, leaving open the opportunity to recruit the best scientist in the field. The individual that has been hired is a non-ruminant nutritionist who works across two species. A Food Scientist position in food processing has also followed the disciplinary emphasis, with the possibility of working with fruits and vegetables, as well as meat products. This summer the department started the process of undergraduate curriculum review and the faculty involved have looked specifically at the disciplinary courses that make up the core of our curriculum (e.g. nutrition, physiology, anatomy, etc.). Further, some of our research programs (e.g. precision dairy) have integrated several disciplines such as animal behavior, husbandry, engineering, economics, modelling, and nutrition into the projects.

Analysis of results and reflection: The department has been more intentional about considering a discipline approach to many of our programs since the 2011 retreat, where consensus was reached on the need to emphasize multidisciplinary approaches, while meeting the needs of stakeholders.

Ongoing improvement actions: The department is aware of the need to have a balance between species and discipline-based approaches to our programs and will continue to consider this balance as we move forward. The newer faculty in the department tend to be very receptive to multidisciplinary programs that add to productivity and competitiveness for funding.

8. Study the interactive benefits/costs of targeted program expansion/reduction with consideration of the new university budget model.

Assessment method: When the new budget model is revealed, the chair and faculty leadership will work with CAFE administration to evaluate the options and potential impact of the new budget model on all programs in the department.

Results: Since the new budget model has not yet been finalized, there are no results to report.

Analysis of results and reflection: With no data to analyze, it is premature to predict whether or not program expansion or program reductions are valid considerations. The reality is that student numbers are increasing, faculty FTE's have decreased, classroom space is limited for larger classes, and faculty time dedicated to teaching has increased.

Ongoing improvement actions: To be determined, once the new budget model is in place.

9. Teaching loads must be properly balanced to allow the faculty to address other program priorities.

Assessment method: Using annual DOE records, the department will track the impact on distribution of effort of growing student enrollment and the decrease in faculty numbers.

Results: Over the five-year period of FY 08-09 to 13-14, FTE has changed from 9.8 to 8.6, 16.7 to 13.5, and 13.5 to 11.9 in teaching, research and Extension, respectively. The total number of faculty decreased from 40 to 34. Undergraduate student numbers over the same time period have increased by 75% from approximately 339 to 595.

Analysis of results and reflection: Due to budget cuts and retirements, our total faculty numbers decreased by 6 over the five-year period in the midst of increasing student numbers. In order to accommodate the teaching demand, more faculty had to be shifted to teaching efforts. Thus, we lost about 3.2 FTE in research, 1.6 FTE in Extension, while only experiencing 1.2 FTE decrease in teaching. We have retained one or two faculty in post-retirement positions to help cover teaching responsibilities. The faculty are concerned about the loss of both research and Extension efforts that may result in departmental inability to serve stakeholders or to maintain publication and grant productivity. There appears to be no logical way to adjust for the changes without new faculty or instructors/lecturers.

Ongoing improvement actions: The department must continually seek opportunities to hire new faculty that can contribute to teaching and the other missions or consider new models for teaching lower-level courses, e.g. hiring part-time instructors.

10. The department should consider how to better support undergraduate students in judging events and club activities.

Assessment method: This recommendation was rejected due to budgetary constraints. However, we are tracking endowments related to judging teams via SAP.

Results: Two endowments totaling \$25,820 currently provide some funding for judging teams. In addition, the department provides \$2,000 of departmental funds to each team for travel, funds teaching expenses, and provides funding for the stipend of each graduate student coach.

Analysis of results and reflection: Although the department is supportive of the judging program, budget constraints prevent an investment beyond the current level.

Ongoing improvement actions: New revenue streams would be necessary to increase investment in judging teams. Once a new Extension Associate for Youth Livestock Programs is hired, one of their responsibilities will be to work with the CAFE Development Officer and investigate fundraising opportunities to increase endowments. A portion of the sales of a new branded sausage product (to be sold at Rupp Arena) will go to the support of the judging program.

PROGRAM REVIEW IMPLEMENTATION PLAN
PROGRESS REPORT
Animal and Food Sciences
October, 2015

1. Enhance and increase regular communication with commodity groups and stakeholders.

Assessment method: Departmental commodity coordinators and the chair will individually evaluate and determine the most effective means of communicating with commodity groups and stakeholders.

Results: Communication with commodity groups and stakeholders occurred through a variety of methods, including: [1] departmental representatives (chair or faculty members) that sit on the various Farm Bureau Advisory Committees and commodity organization boards; [2] the UK Dairy Research Showcase sponsored by the department's dairy group was held and members of the KY Dairy Development Council, dairy agribusinesses, and dairy producers were invited to attend; [3] the biennial Beef Bash at the Research and Education Center in Princeton was held and KY Cattlemen's Association, beef agribusinesses, and beef producers were invited to attend; [4] members of the department's Beef Extension Group directly partner with KY Cattleman's Association on the Kentucky Beef Network; and [5] the department's Extension Associate for Youth Livestock Programs serves as a member of the KY Department of Agriculture's District Livestock Shows Advisory Board.

Analysis of results and reflection: Having departmental faculty and staff within a commodity or stakeholder area work directly with commodity and stakeholder groups provides a great venue to discuss commodity specific issues and needs, as well as to communicate departmental challenges and programs.

Ongoing improvement actions: The department will continue to communicate with stakeholders and commodity groups through the existing advisory committees or commodity boards. This allows for one-on-one interaction with the groups. Other departmental commodity groups will be encouraged to offer events like the Dairy Research Showcase and Beef Bash to update groups on research and outreach activities.

2. Develop strategies to expand the delivery of distance learning, on-line courses, and virtual classroom concept.

Assessment method: *This was rejected in the Implementation Plan due to lack of departmental faculty and budgetary resources.*

3. Explore how faculty can be certain to receive performance credit for all major activities.

Assessment method: During 2015 performance evaluations, faculty will confirm DOE and clearly document activities, accomplishments, and impact.

Results: The 2015 performance evaluation process is currently in progress. The chair will remind faculty to document their activities and accomplishments in their CV and will also remind evaluation committees to emphasize these accomplishments during performance evaluations.

Analysis of results and reflection: Some faculty members do not feel they are rewarded during performance reviews for the efforts they put forward. However, the college has clear guidelines for calculating teaching DOE and the faculty uses those guidelines when they turn in their DOE. The department will make greater efforts in referring to the departmental Evidences of Activity, so faculty clearly understand what defines rewarded accomplishments in teaching, research, and Extension.

Ongoing improvement actions: The department will continue to make every effort to give credit to faculty for their efforts and accomplishments during performance reviews, as outlined in the Evidences of Activity. The performance evaluations will continue to utilize faculty committees, including the chair, who review the documentation provided by each faculty member.

4. Explore how faculty and departmental leadership can expand collaborative projects and opportunities with other units.

Assessment method: The UK Research Sponsored Project reports will be monitored for collaborative grants. In addition, the chair will work with CAFE administration to monitor and identify potential collaboration and partnerships.

Results: In FY 2015, the department faculty were PI's on \$2,825,088 in grants that involved collaboration with other departments or other universities. In addition, department faculty were co-PI's on \$746,471 in grants on which faculty outside the department were the PI.

Analysis of results and reflection: Upon analysis of the grants that the department receives, 72% of the funding for FY 2015 involves collaboration with professionals outside the department or with other universities. The department has done an excellent job of establishing and taking advantage of collaborative arrangements or partnerships. In addition to collaborative grants, other examples of collaboration include the Food Connection (with Aramark), Extension activities through the Kentucky Beef Network, Extension programming across departments, and the Butcher Shop partnership with Dining Services. Additionally, department faculty have many collaborative agreement/arrangements with industry groups that have utilization of equipment and other materials in research and extension projects.

Ongoing improvement actions: The chair and faculty will continue to communicate with CAFE administration, as well as the UK Director of Corporate Partners, to identify opportunities for collaboration. The chair will distribute to the faculty any appropriate grant opportunities and deadlines that are identified via listserv, Grants Bulletin, or other sources.

5. Develop a plan for a facility and classroom improvement initiative.

Assessment method: Departmental and CAFE project records will be reviewed annually and compared with a list of facility needs compiled by the chair from faculty/staff input and personal observation of the physical plant.

Results: In 2015, classroom and teaching improvements include classroom B52 in Garrigus, which was completely renovated by UK; lab 104 in Garrigus, which was equipped with a new sitting-height bench; and room 901 in Garrigus, which is currently being equipped with complete computer/flat screen capabilities, LCD projector capabilities, and white boards. Facility improvements in 2015 include a new

feed center at the LRC, new silage unloader and fencing at WKREC Beef Unit, new gutters at LRC Sheep Unit, new windows in LRC Beef Unit manager's residence, replacement of HVAC unit at Coldstream Poultry Unit, replacement of walk-in freezer at LRC Beef Unit, and a new Dairy Housing, Teaching, and Research Facility is currently under construction. Equipment upgrades in 2015 include a new manure dump wagon at the Coldstream Dairy, a new scale at the Coldstream Poultry Unit, a new ultrasound at the LRC Swine Unit, a new ultra-cold freezer for the Garrigus 8th floor lab, and a new solvent extractor for the Garrigus 6th floor lab. Also, a review of all office, lab, storage, and research space in Garrigus is currently underway to determine how to most efficiently utilize space. Finally, discussions with Physical Plant are currently underway to determine how to best maintain all of the walk-in freezers/coolers in Garrigus.

Analysis of results and reflection: Significant progress has been made in upgrading classrooms in Garrigus Building. Some of the urgent farm facility and equipment needs have been met and new construction projects are underway. LRC animal units are approximately 15 years old and infrastructure needs are being identified. Significant investment is needed to repair and maintain walk-in freezers/coolers in Garrigus. Also, the continued growth of our undergraduate programs has created a real need for additional classroom and lab space.

Ongoing improvement actions: The chair will continue to survey faculty/staff for the most critical issues that hinder productivity of the research and teaching programs. Personnel are encouraged to identify pending facility and equipment deficiencies so we can plan for the future.

6. Work with CAFE administration to simplify business and accounting practices.

Assessment method: The chair will monitor and provide input on proposed new business practices through the CAFE Chairs meetings and Dean's Administrative meetings, with the objective of relieving the workload of faculty, yet maintaining appropriate financial oversight.

Results: In recent years, it appears that the amount of paperwork required of faculty has increased, hindering their ability to perform their academic responsibilities. The chair has actively discussed and been opposed to any new proposals that increased faculty paperwork, but had no positive impact on productivity. Where new approval forms have been implemented, we have tried to use electronic signatures if possible so approvals can be given outside the office. Also, where new university purchasing arrangements have arisen (such as with VWR), we have attempted to develop a consistent and easy process for faculty and staff to use when making purchases.

Analysis of results and reflection: Although the department can be proactive in guarding against increased paperwork for faculty, the reality is that we have very little control over implementation of new university policies. The move toward more online business procedures may reduce paper on the one hand, but may increase the need for faculty or other supervisors to be more vigilant at checking email or Enterprise Services for actions that they must take. I believe we are adjusting to the online environment.

Ongoing improvement actions: The chair and faculty will continue to be vigilant of changes in business procedures and evaluate the most efficient and time-saving methods to address the new procedures. Additionally, the chair will coordinate training for departmental Business Office staff with the CAFE Business Office to enhance their ability to serve the needs of faculty and staff.

7. **Consideration must be taken of the balance between a species and discipline approach for teaching/research. This is critical to the continued success of the department.**

Assessment method: The department will seriously discuss and evaluate the balance of species and discipline emphasis in the department programs when hiring new faculty and as we review the curriculum.

Results: Recent faculty searches and hires have been more discipline focused to allow more cross-species interaction and collaboration. For the past several months the department has been reviewing its undergraduate curriculum review, specifically evaluating the disciplinary courses that make up the core of our curriculum (e.g. nutrition, physiology, anatomy, etc.). Further, some of our research programs (e.g. precision dairy) have integrated several disciplines such as animal behavior, husbandry, engineering, economics, modelling, and nutrition into the projects.

Analysis of results and reflection: In recent years, as a result of discussions and planning at our faculty retreat in 2011, the department has been more intentional about considering a discipline approach for many of our programs. It will be important going forward to make sure this approach meets the needs of our clientele and stakeholders.

Ongoing improvement actions: The department is aware of the need to have a balance between species and discipline-based approaches to our programs and will continue to consider this balance as we move forward. The newer faculty in the department tends to be very receptive to multidisciplinary programs that add to productivity and competitiveness for funding.

8. **Study the interactive benefits/costs of targeted program expansion/reduction with consideration of the new university budget model.**

Assessment method: When the new budget model is revealed, the chair and faculty leadership will work with CAFE administration to evaluate the options and potential impact of the new budget model on all programs in the department.

Results: Since the new budget model has not yet been finalized, there are no results to report.

Analysis of results and reflection: With no data to analyze, it is premature to predict whether or not program expansion or program reductions are valid considerations. The reality is that student numbers are increasing, faculty FTE's have decreased, classroom space is limited for larger classes, and faculty time dedicated to teaching has increased.

Ongoing improvement actions: To be determined, once the new budget model is in place.

9. **Teaching loads must be properly balanced to allow the faculty to address other program priorities.**

Assessment method: Using annual DOE records, the department will track the impact on distribution of effort of growing student enrollment and the decrease in faculty numbers.

Results: Over the five-year period of FY 09-10 to 14-15, FTE has changed from 10.0 to 8.5, 15.9 to 12.6, and 13.1 to 11.5 in teaching, research and Extension, respectively. The total number of faculty decreased from 38 to 34. Undergraduate student numbers from degree programs totally taught by (ANSC and FSC) or largely taught (ESMA) by department faculty and staff over the same time period have increased by 61% from approximately 387 to 625.

Analysis of results and reflection: Due to budget cuts and retirements, our total faculty numbers decreased by 4 over the five-year period in the midst of increasing student numbers. In order to accommodate the teaching demand, more faculty had to be shifted to teaching efforts. Thus, we lost about 3.3 FTE in research, 1.6 FTE in Extension, while also experiencing 1.6 FTE decrease in teaching. We have retained one or two faculty in post-retirement positions to help cover teaching responsibilities. Faculty are concerned about the loss of both research and Extension efforts that may result in departmental inability to serve stakeholders or to maintain publication and grant productivity. Instructional efforts are currently being reinforced by the recruitment of a Lecturer position in ESMA, and two additional Lecturer positions (one each in ANSC and ESMA) may be forthcoming as well.

Ongoing improvement actions: The department must continually seek opportunities to hire new faculty that can contribute to teaching and the other missions.

10. The department should consider how to better support undergraduate students in judging events and club activities.

Assessment method: This recommendation was rejected due to budgetary constraints. However, we are tracking endowments related to judging teams via SAP.

Results: Interest from two endowments totaling \$25,006 currently provides some funding for judging teams. In addition, the department provides \$2,000 of departmental funds to each team for travel, funds teaching expenses, and provides funding for the stipend of each graduate student coach.

Analysis of results and reflection: Although the department is supportive of the judging programs, current budget constraints prevent an investment beyond the current levels. The new Extension Associate for Youth Livestock Programs and the new Collegiate Livestock Judging Team have been meeting with and contacting potential donors to establish relationships and secure funding for the program.

Ongoing improvement actions: New revenue streams will be necessary to increase investment in judging teams. One of the responsibilities of the new Extension Associate for Youth Livestock Programs is to work with the CAFE Development Officer to investigate fundraising opportunities to increase endowments and to increase contributions for operating expenses. A portion of the sales of the Spicy Fat Cat (a new branded sausage product which is sold at Rupp Arena and Commonwealth Stadium) goes to the support of the judging program.

**PROGRAM REVIEW IMPLEMENTATION PLAN
PROGRESS REPORT
Animal and Food Sciences
2015 - 2016**

1. Enhance and increase regular communication with commodity groups and stakeholders.

Assessment method: Departmental commodity coordinators and the Chair will individually evaluate and determine the most effective means of communicating with commodity groups and stakeholders.

Results: Communication by the Chair and the department's faculty/staff with commodity groups and stakeholders occurred through a variety of methods, including: [1] serving on the various Farm Bureau Advisory Committees and commodity organization boards; [2] Field Days and other informational-sharing activities such as the biennial Beef Bash sponsored by the department's beef group, Dairy Research Showcase sponsored by the department's dairy group, and Ewe Profit School sponsored by the department's sheep group; [3] partnership between members of the department's Beef Extension Group and the KY Cattleman's Association on the Kentucky Beef Network; and [4] the department's Extension Associate for Youth Livestock Programs serves as a member of the KY Department of Agriculture's District Livestock Shows Advisory Board.

Analysis of results and reflection: Having departmental faculty and staff within a commodity or stakeholder area work directly with commodity and stakeholder groups provides a great venue to discuss commodity specific issues and needs, as well as to communicate departmental challenges and programs.

Ongoing improvement actions: The department will continue to place a priority on communication with stakeholders and commodity groups, and will continue efforts of involvement with existing advisory committees or commodity boards. This allows for one-on-one interaction with the groups. Faculty and staff from other departmental commodity groups will be encouraged to offer events like the Dairy Research Showcase and Beef Bash to update groups on research and outreach activities.

2. Develop strategies to expand the delivery of distance learning, on-line courses, and virtual classroom concept.

Assessment method: *This was rejected in the Implementation Plan due to lack of departmental faculty and budgetary resources.*

3. Explore how faculty can be certain to receive performance credit for all major activities.

Assessment method: During 2016 performance evaluations, faculty will confirm DOE and clearly document activities, accomplishments, and impact.

Results: The 2016 performance evaluation process is currently in progress. The chair will remind faculty to document their activities and accomplishments in their CV and will also remind evaluation committees to emphasize these accomplishments during performance evaluations.

Analysis of results and reflection: Some faculty members do not feel they are rewarded during performance reviews for the efforts they put forward. However, the college has clear guidelines for calculating teaching DOE and the faculty uses those guidelines when they turn in their DOE. The department will make greater efforts in referring to the university's Administrative Regulations, CAFE policies and guidelines, and departmental Evidences of Activity so faculty clearly understand what defines rewarded accomplishments in teaching, research, and Extension.

Ongoing improvement actions: The department will continue to make every effort to give credit to faculty for their efforts and accomplishments during performance reviews, as outlined in the university's Administrative Regulations, CAFE policies and guidelines, and the department's Evidences of Activity. The performance evaluations will continue to utilize faculty committees, including the chair, who review the documentation provided by each faculty member.

4. Explore how faculty and departmental leadership can expand collaborative projects and opportunities with other units.

Assessment method: The UK Research Sponsored Project reports will be monitored for collaborative grants. In addition, the chair will work with CAFE administration to monitor and identify potential collaboration and partnerships.

Results: In FY 2016, the department faculty were PI's on \$3,038,323 in grants that involved collaboration with other departments or other universities. In addition, department faculty were co-PI's on \$1,773,998 in grants on which faculty outside the department were the PI.

Analysis of results and reflection: Upon analysis of the grants that the department receives, 84% of the funding for FY 2016 involves collaboration with professionals outside the department or with other universities. The department has done an excellent job of establishing and taking advantage of collaborative arrangements or partnerships. In addition to collaborative grants, other examples of collaboration include the Food Connection (with Aramark), Extension activities through the Kentucky Beef Network, Extension programming across departments, and the Butcher Shop partnership with Aramark. Additionally, department faculty have many collaborative agreement/arrangements with industry groups that involve utilization of equipment and other materials in research and extension projects.

Ongoing improvement actions: The chair and faculty will continue to communicate with CAFE administration, as well as the UK Director of Corporate Partners, to identify opportunities for collaboration. The chair will distribute to the faculty any appropriate grant opportunities and deadlines that are identified via listserv, Grants Bulletin, or other sources.

5. Develop a plan for a facility and classroom improvement initiative.

Assessment method: Departmental and CAFE project records will be reviewed annually and compared with a list of facility needs compiled by the chair from faculty/staff input and personal observation of the physical plant.

Results: In 2016, Garrigus 901 was equipped with computer/flat screen capabilities, LCD projector capabilities, and white boards to aid in teaching activities. Several large rooms in Garrigus are being

renovated for use by graduate students, and space on the 9th floor of Garrigus is being renovated to allow of the department's personnel performing business functions to be housed on the 9th floor. The department participated in the Master Plan study evaluating long-term facility needs for both the department and college. Facility improvements in 2016 include completion of the new Dairy Housing, Teaching, and Research Facility at the Dairy Unit. Other construction projects underway at the Dairy Unit include new roadways, upgraded liquid manure/wastewater pipelines to the lagoon, and new feed bunks for dry cows. Discussions are also taking place to exploring the potential construction of a new milking parlor at the Dairy Unit. The department is working with Alltech, Inc., to replace many of the interior and exterior doors at the Poultry Unit. The department is working with the CAFE Research Office to replace some of the fencing at the Equine Unit. Equipment upgrades in 2016 include a new incinerator and new incubator/hatcher at the Poultry Unit, a fork lift at the Swine Unit, a trailer for the UKREC Beef Unit, and trailer for the Equine Unit. Finally, the department has worked with Physical Plant Division to devise a repair and maintenance plan for freezers/coolers in Garrigus that should allow for their long-term maintenance and usage.

Analysis of results and reflection: Progress has been made in upgrading farm facilities, and other needed projects are underway. Significant investments in the freezers/coolers in Garrigus have also been made, and plans are in progress to complete repairs on these units so they can be fully transferred to Physical Plant Division for their oversight and maintenance. As the animal units continue to age, significant investments will need to be made to keep these units operational and functional. Also, the continued growth of our undergraduate programs has created a real need for additional classroom and lab space.

Ongoing improvement actions: The chair will continue to survey faculty/staff for the most critical issues that hinder productivity of the research and teaching programs. Personnel are encouraged to identify pending facility and equipment deficiencies so we can plan for the future.

6. **Work with CAFE administration to simplify business and accounting practices.**

Assessment method: The chair will monitor and provide input on proposed new business practices through the CAFE Chairs meetings and Dean's Administrative meetings, with the objective of relieving the workload of faculty, yet maintaining appropriate financial oversight.

Results: In recent years, it appears that the amount of paperwork required of faculty has increased, hindering their ability to perform their academic responsibilities. An example of this includes the new documentation requirements for Procard purchases. The chair has actively discussed and been opposed to any new proposals that increased faculty paperwork with no corresponding positive impact on productivity. Where new approval forms have been implemented, we have tried to use electronic signatures if possible, so approvals can be given outside the office. Also, where new university purchasing arrangements have arisen (such as with VWR), we have attempted to develop a consistent and easy process for faculty and staff to use when making purchases.

Analysis of results and reflection: Although the department can be proactive in guarding against increased paperwork for faculty, the reality is that we have very little control over implementation of new university policies. The move toward more online business procedures may reduce paper on the one hand, but may increase the need for faculty or other supervisors to be more vigilant at checking

email or Enterprise Services for actions that they must take. I believe we are adjusting to the online environment.

Ongoing improvement actions: The chair and faculty will continue to be vigilant of changes in business procedures and evaluate the most efficient and time-saving methods to address the new procedures. Additionally, the chair will coordinate training for departmental Business Office staff with the CAFE Business Office to enhance their ability to serve the needs of faculty and staff.

7. Consideration must be taken of the balance between a species and discipline approach for teaching/research. This is critical to the continued success of the department.

Assessment method: The department will seriously discuss and evaluate the balance of species and discipline emphasis in the department programs when hiring new faculty and as we review the curriculum.

Results: Recent faculty searches and hires have been more discipline focused to allow more cross-species interaction and collaboration. For the past several months the department has been reviewing its undergraduate curriculum review, specifically evaluating the disciplinary courses that make up the core of our curriculum (e.g. nutrition, physiology, anatomy, etc.). Further, some of our research programs (e.g. precision dairy) have integrated several disciplines such as animal behavior, husbandry, engineering, economics, modelling, and nutrition into the projects.

Analysis of results and reflection: In recent years, as a result of discussions and planning at our faculty retreat in 2011, the department has been more intentional about considering a discipline approach for many of our programs. It will be important going forward to make sure this approach meets the needs of our clientele and stakeholders.

Ongoing improvement actions: The department is aware of the need to have a balance between species and discipline-based approaches to our programs and will continue to consider this balance as we move forward. The newer faculty in the department tends to be very receptive to multidisciplinary programs that add to productivity and competitiveness for funding.

8. Study the interactive benefits/costs of targeted program expansion/reduction with consideration of the new university budget model.

Assessment method: When the new budget model is revealed, the chair and faculty leadership will work with CAFE administration to evaluate the options and potential impact of the new budget model on all programs in the department.

Results: Since the hiring of the new Provost, the much talked about new budget model was scrapped. The college and department await details on how the new Provost will determine and award budgets.

Analysis of results and reflection: Once budget details are revealed, the department will make adjustments to address budget needs. The reality is that student numbers are increasing, faculty FTE's have decreased, classroom space is limited for larger classes, and faculty time dedicated to teaching has increased.

Ongoing improvement actions: To be determined, once the new budget model is in place.

9. Teaching loads must be properly balanced to allow the faculty to address other program priorities.

Assessment method: Using annual DOE records, the department will track the impact on distribution of effort of growing student enrollment and the decrease in faculty numbers.

Results: The addition of two Lecturer faculty lines in 2016 has improved the FTEs providing instruction. Over the five-year period of FY 10-11 to 15-16, FTE changed from 9.1 to 10.5, 15.5 to 13.5, and 12.4 to 11.8 in teaching, research and Extension, respectively. The total number of faculty decreased from 38 to 36. Undergraduate student numbers from degree programs totally taught by (ANSC and FSC) or largely taught (ESMA) by department faculty and staff over the same time period have increased approximately 82% from approximately 393 to 717.

Analysis of results and reflection: Due to budget cuts and retirements, our total faculty numbers decreased by 2 over the five-year period in the midst of increasing student numbers. In order to accommodate the teaching demand, two new faculty in the Lecturer Title Series were hired in 2016 and one faculty was retained in a post-retirement position to help cover teaching responsibilities. This has helped stop the shift from research and Extension FTEs to teaching FTEs.

Ongoing improvement actions: The department presently has two faculty searches underway, and both positions have a portion of teaching FTE.

10. The department should consider how to better support undergraduate students in judging events and club activities.

Assessment method: This recommendation was rejected due to budgetary constraints. However, we are tracking endowments related to judging teams via SAP.

Results: Interest from two endowments totaling \$25,006 currently provides some funding for judging teams. In addition, the department provides \$2,000 of departmental funds to each team for travel, funds teaching expenses, and provides funding for the stipend of each graduate student coach.

Analysis of results and reflection: Although the department is supportive of the judging programs, current budget constraints prevent an investment beyond the current levels. The new Extension Associate for Youth Livestock Programs and the new Collegiate Livestock Judging Team have been meeting with and contacting potential donors to establish relationships and secure funding for the program.

Ongoing improvement actions: New revenue streams will be necessary to increase investment in judging teams. One of the responsibilities of the new Extension Associate for Youth Livestock Programs is to work with the CAFE Development Office to investigate fundraising opportunities to increase endowments and to increase contributions for operating expenses.

Appendix B

IFT Letter of
Accreditation for Food
Science Undergraduate
Degree Program

APPENDIX B



Institute of Food Technologists
525 W. Van Buren Street, Suite 1000
Chicago, Illinois 60607-3830 USA

+1.312.782.8424
+1.312.782.8348 Fax
ift.org

December 8, 2014

**Due August 31, 2015:
Annual Update Report**

William Boatright
University of Kentucky-Anml.Sci.
Department of Animal & Food Sciences
412 W.P. Garrigus Building
Lexington, KY 40546-0215
USA

Dear Dr. Boatright,

As you know from our recent conference call, the IFT Higher Education Review Board (HERB) voted to approve your program, *B.S. in Food Science*, as meeting the Education Standards for Degrees in Food Science. Please ensure that students, faculty, and administrators understand that only students enrolled in this particular emphasis/option are eligible for IFT undergraduate scholarships.

Enclosed with this letter, you will find a detailed summary of your application's review. We hope that the comments, suggestions, and recommendations made by members of HERB will be helpful to your program. We look forward to receiving your annual report and five year goals in your next report due **August 31, 2015**.

Please note the following dates for your future annual update reports and 5-year re-approval application. The 2011 Resource Guide for Approval and Re-Approval of Undergraduate Food Science Programs was approved by IFT's Board of Directors in Spring 2011 and will be in use for your next review.

August 31, 2015: Submit Annual Update Report
August 31, 2016: Submit Annual Update Report
August 31, 2017: Submit Annual Update Report
August 31, 2018: Submit Annual Update Report
August 31, 2019: Submit Application for 5-Year Re-Approval

Note that these requirements/dates may be adjusted should your status as an IFT-approved program change.

Thank you for your time and effort in submitting your application materials and your continued efforts in training the next generation of food scientists.



Institute of Food Technologists
525 W. Van Buren Street, Suite 1000
Chicago, Illinois 60607-3830 USA

+1.312.782.8424
+1.312.782.8348 Fax
ift.org

Sincerely,

Richard W. Hartel

Rich Hartel
Chair, Higher Education Review Board

Enclosures

C: Anna Ylijoki, IFT Staff Coordinator



feeding the minds
that feed the world

Higher Education Review Board

Date: 11th November 2014

Institution: University of Kentucky

Department: Animal and Food Sciences

Degree program(s) being considered for approval: BS in Food Science

Lead Reviewer: Steve Flint

Second Reviewer: Wes Schilling

Reader: Clifford Hall

Faculty

There are 7 faculty, all with PhD qualifications, full time and covering a variety of appropriate specializations. Two staff members are retiring and will be replaced.

Facilities

A Food Systems Innovation Center has been implemented to assist food manufacturers with technical and business expertise. This is a collaborative initiative with a number of departments within the College of Agriculture.

Curriculum

The curriculum follows an expected format with foundation courses in basic science in the first and second years with more food focused papers in the third and fourth years. There have been some modifications to the curriculum to align with the changes in the universities core offerings, college and IFT requirements. Some new courses have been introduced to develop critical thinking. The key course content remains the same but electives have been dropped from 11 to 3 credits.

Course content has changed as a result of assessment. This includes Sensory evaluation in which more statistics has been included into the course content.

Coverage of IFT Core Competencies

A core competency grid is included for the IFT core competencies. On page 25, there is a statement about using exam grades as a direct measurement of learning. This can be appropriate if there is a rubric for the tests that can be linked to student development and point levels are defined in the rubric for short answer and essay questions.



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that feed the world

Higher Education Review Board

Program outcomes

All 6 program outcomes are student focused and measurable, strongly biased towards advanced levels of Blooms' taxonomy.

Summary of assessments over the previous 5-year period

A summary of the 5 year annual assessments is given with two or three student learning outcomes evaluated each year. Two key areas have been addressed – as requested by IFT HERB following IFT HERB approval in 2010. These were more evidence of input from the food industry with the internship program and improved student participation in leadership activities.

Future Goals and Planning for Improvement

There is a comprehensive plan for the next 5 years with assessment of 7 specific student learning outcomes. One of the new initiatives is an Academic Enrichment Experience which will be satisfied by either the internship program or a special problems course that involves a laboratory project. The second new initiative is a Graduation Composition and Communication Requirement which requires the students to prepare a 5 page report and oral presentation on a new product concept with justifications. Both of these initiatives address student skills and will be continuously assessed during the implementation phase. Limited details are given but we like the forward looking, student focused approach.

Recommendation

That this program is re-approved.

Appendix C

Two-Page Faculty CVs

APPENDIX C -- 2-Page Faculty Resumes

FACULTY RESUME (2011-2017)

Name: Debra K. Aaron

Academic Rank: Professor

Year of First UK Appointment: 1984

Specialization: Animal Breeding and Genetics

% DOE (6 yr avg): **Research:** 22%

Extension: 0%

Teaching: 78%

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.S.	1978	University of Kentucky
2.	M.S.	1981	University of Kentucky
3.	Ph.D.	1984	Oklahoma State University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. President-Elect, President, Past President, ASAS, 2014-16
2. Director-at-Large, Board of Directors, ASAS, 2009-12
3. Chair, Foundation Board of Trustees, ASAS, 2017-19
4. Vice-President, President, Past President, National Block and Bridle Club, 2012-16
5. Secretary, Vice-Chair, Chair, NCERA-214 Coordinating Committee, 2016-18

Awards

1. Fellow Award (Teaching), ASAS, 2012
2. Distinguished Teacher Award, ASAS, 2013
3. Distinguished Service Award, Southern Section, ASAS, 2013
4. Outstanding Alumnus Award, Gamma Sigma Delta, UK, 2014
5. Joe T. Davis Outstanding Advisor Award, CAFE, UK, 2012

Committees

1. Production, Research, and Education Committee, American Sheep Industry, 2011-17
2. Editorial Board, HoofPrint: The Small Ruminant Magazine, 2011-17
3. Selection Committee, Sheep Heritage Scholarship, American Sheep Industry, 2016-17
4. Editorial Board, Natural Sciences Education Journal, 2013-17
5. NCERA-214 Coordinating Committee (Increased Efficiency of Sheep Production), 2012-17

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 114

Total number of graduate advisees: 1

Number of graduate students graduated: M.S.: 1 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 3 Ph.D.: 3

Courses Taught (provide course number and semester taught)

ASC 102: Introduction to Livestock and Poultry Production, Spring, 2011-17

ASC 362: Animal Breeding and Genetics, Spring, 2011-17 and Fall, 2017

STA 570: Basic Statistical Analysis, Fall, 2011-13

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 1	Invited Presentations: 21
Abstracts: 8	Fact Sheets: 0
Book Contributions: 0	Posters: 3
Conference Proceedings: 1	Popular Magazines: 26
Numbered Extension Publications: 7	Patents/Genbank Register: 0
Reports of Progress: 0	Other (e.g. websites): 1

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 64,782	As PI: \$ 0	As PI: \$ 0
As Co-PI: \$ 91,782	As Co-PI: \$ 6,035	As Co-PI: \$ 6,000
Subtotal: \$ 156,564	Subtotal: \$ 6,035	Subtotal: \$ 6,000

Total funding received: \$ 168,599

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Teaching: Improving the student experience was the focus. ASC 102 (Introduction to Livestock and Poultry Production) was updated and improved each semester, with an emphasis on hands-on, farm animal experiences. ASC 362 (Animal Breeding and Genetics), developed and taught first in spring of 2011, continued to evolve with virtual lab experiences. As Director of Undergraduate Studies (DUS), curriculum improvements were made, academic enrichment experiences for students were clarified and enhanced, and advising programs were streamlined.

Research: Hair sheep germplasm was incorporated into a flock of Polypay ewes through White Dorper rams via a grading-up mating scheme. A contemporary group of Polypay ewes, bred to Polypay rams, was maintained as a control. Development of this flock of productive, White Dorper sheep yielded maternal, growth, and carcass data that were shared with other researchers at regional and national meetings, used as a tool for educating sheep producers, and were incorporated into the classroom to demonstrate genetic principles. White Dorper sheep were exhibited and received awards at regional and national shows and sales. The latter is important because it demonstrates a grading-up mating scheme can be successful in producing "purebred" animals that are comparable to "fullblood" animals of the desired breed.

Goals for Next Five Years

Teaching:

1) Enhance student learning through better teaching and use of up-to-date course materials and appropriate delivery methods. 2) Facilitate better communication among students and faculty and move forward improvements in curriculum, courses, and advising in roll of DUS.

Research:

1) Improve genetic merit of Polypay and White Dorper flocks through enrollment in National Sheep Improvement Program. 2) Develop a research program designed to verify use of quantitative genetic selection (Estimated Breeding Values, EBVs) for sheep improvement.

Extension:

No formal extension responsibilities but will seek to promote widespread sheep producer use of quantitative genetic selection (EBVs) by demonstrating genetic gain achieved for economically important traits in a well-designed research program.

FACULTY RESUME (2011-2017)

Name: Sunday Adedokun

Academic Rank: Assistant Professor

Year of First UK Appointment: 2015

Specialization: Non-ruminant Nutrition

% DOE (6 yr avg): **Research:** 90.105

Extension: -

Teaching: 9.895

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	Ph.D.	2007	Purdue University
2.	MS	2004	Purdue University
3.	BS	1995	Obafemi Awolowo University (Nigeria)

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Associate Editor, Poultry Science (2016 till date)
- 2.
- 3.
- 4.
- 5.

Awards

1. Early Achievement Award (Research). Poultry Science Association (2016)
- 2.
- 3.
- 4.
- 5.

Committees

1. Animal Science Reunion (member till 2019)
- 2.
- 3.
- 4.
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 21 (7/yr)

Total number of graduate advisees: 3

Number of graduate students graduated: M.S.: 0 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 1 Ph.D.: 2

Courses Taught (provide course number and semester taught)

ASC 378: Fall 2015 and 2016

ASC 340: Spring 2016 and 2017

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 2 (6)	Invited Presentations: 2
Abstracts: 10	Fact Sheets: 0
Book Contributions: 0	Posters: 2
Conference Proceedings: 1	Popular Magazines: 0
Numbered Extension Publications: 0	Patents/Genbank Register: 0
Reports of Progress: 0	Other (e.g. websites): 0

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 1,600	As PI: \$ 256,163	As PI: \$ 148,678
As Co-PI: \$ 0	As Co-PI: \$ 50,000	As Co-PI: \$ 0
Subtotal: \$ 1,600	Subtotal: \$ 306,163	Subtotal: \$ 148,678

Total funding received: \$ 456,441

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Teaching

I have had the opportunity to be involved in teaching two classes at the undergraduate level. In order to enhance my teaching as well as the learning experience of my students, I have worked closely with CELT. These interactions play an important role in the delivery of my lectures.

Research

Over the last two and a half years, I have had the opportunity to work collaboratively with some faculty within our department and college and outside of UK. This has resulted in more than 12 studies being completed with 10 abstracts already presented at regional, national, and international meetings. Additionally, six journal articles (2 from UK) have been published. Furthermore, over \$450,000 (gifts account for \$148,678) have been brought in mostly from the industry.

Goals for Next Five Years

Teaching:

I will continue to work closely with Center for the Enhancement of Learning and Teaching (CELT) on ways to improve on my pedagogical skills, especially in the area of content delivery and technology

Research:

I plan to work on increasing my collaborative efforts within the department, college, and across universities

Extension:

FACULTY RESUME (2011-2017)

Name: Amaral-Phillips, Donna M.

Academic Rank: Extension Professor

Year of First UK Appointment: 1988

Specialization: Dairy Nutrition & Management

% DOE (6 yr avg): **Research:** 0

Extension: 100 %

Teaching: 0

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.S.	1981	University of Connecticut
2.	M.S.	1983	North Carolina State University
3.	Ph.D.	1988	Iowa State University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Project Team Leader for DAIReXNET- national eXtension initiative
2. American Dairy Science Assoc.- National Extension Education Committee
3. University of KY University Senate
- 4.
- 5.

Awards

1. Although not an official award- written materials have been republished in all of the national
2. and regional dairy magazines
- 3.
- 4.
- 5.

Committees

1. Senior Coordinator for North American Invitational 4-H Dairy Quiz Bowl
2. UK- University Promotion and Tenure Committee for Extension Title Series
3. UK- Dept of AFS- Dairy Faculty Search Committee Member
- 4.
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 0

Total number of graduate advisees: 0

Number of graduate students graduated: M.S.: 0 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 7 Ph.D.: 3

Courses Taught (provide course number and semester taught)

ASC 333 or GEN 300- Dairy Challenge training

Guest Lectures in ASC 420 "Dairy Cattle Science"- 7 lectures, 2 labs Fall 2011-2016 and

ASC 564 "Milk Secretion" Spring- 2 lectures

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 1	Invited Presentations: 4
Abstracts: 6	Fact Sheets: = #pubs
Book Contributions: 0	Posters: 0
Conference Proceedings: 2	Popular Magazines: 86
Numbered Extension Publications: 26	Patents/Genbank Register: 0
Reports of Progress: 0	Other (e.g. websites): 3

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$	As PI: \$
As Co-PI: \$	As Co-PI: \$ 283,419	As Co-PI: \$ 867,999
Subtotal: \$ 0	Subtotal: \$ 283,419	Subtotal: \$ 867,999

Total funding received: \$1,151,418

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

KY Dairy Extension Programs for KY dairy producers and industry strive to identify areas and provide educational programming related to (1) identified opportunities statewide which need improvement, (2) changing concepts resulting from expanding knowledge and technology, and (3) ways to sustain and improve profitability. Educational program areas were supported by written materials, one-on-one visits and interactive meetings and have been developed in the areas of silage and overall forage management and nutritional management for the milking herd, dry cows (esp. pre-fresh through fresh period), and heifer replacements (esp. calf feeding). In addition, dairy training opportunities for KY Ag Extension agents have been conducted. I am also a co-leader for the Master Grazer Educational Program which conducts grazing schools and other educational programs and publishes a newsletter during the grazing season.

Project Team Leader for DAIReXNET- national eXtension initiative: DAIReXNET is a national dairy extension web resource with written and video resources which averages 38,435 total page views monthly with a 47% increase from FY 2012 to 2016. This project illustrates what is possible when extension and research faculty and local extension educators work together on a national basis to provide educational opportunities to our end users.

Goals for Next Five Years

Teaching:

Research:

Extension:

Continue to identify areas for opportunities for KY dairy farmers to improve their dairy businesses and provide written materials and educational opportunities to address these identified issues.

FACULTY RESUME (2011-2017)

Name: Leslie H. Anderson

Academic Rank: Professor

Year of First UK Appointment: 1997

Specialization: Extension

% DOE (6 yr avg): **Research:**

Extension: 100

Teaching:

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	BS	1990	University of Missouri - Columbia
2.	MS	1992	Iowa State University
3.	PhD	1996	The Ohio State University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

- 1.
- 2.
- 3.
- 4.
- 5.

Awards

1. Whiteker Award 2016 - Outstanding Extension Specialist, University of Kentucky
2. Southern Region ASAS Extension Award 2014
3. Outstanding Extension Specialist 2015 - Kentucky Assoc. of ANR Agents
- 4.
- 5.

Committees

1. Area Promotion and Tenure Committee, 2011-2015
2. Department Merit Evaluation Committee, 2015
- 3.
- 4.
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 0

Total number of graduate advisees: 1

Number of graduate students graduated: M.S.: 1 Ph.D.:

Number of graduate committees (excluding your students): M.S.: 2 Ph.D.: 1

Courses Taught (provide course number and semester taught)

ASC 364 Reproductive Physiology Spring 2011

ASC 406 Beef Cattle Science, Fall 2011-2016 (co-instructor)

ASC 601 Endocrinology, Fall 2015 (guest instructor)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 2	Invited Presentations: 2
Abstracts: 10	Fact Sheets: 0
Book Contributions: 2	Posters: 4
Conference Proceedings: 2	Popular Magazines: 21
Numbered Extension Publications: 14	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites): 87

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$ 169,528	As PI: \$
As Co-PI: \$	As Co-PI: \$ 1,476,356	As Co-PI: \$
Subtotal: \$	Subtotal: \$ 1,645,884	Subtotal: \$

Total funding received: \$ 1,645,884

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Developed and coordinate The UK IRM Farm Program (2015-present). Currently, 162 producers are enrolled in the program. These producers represented 67 different counties with a total of 6,512 cows. Data from the first year illustrated pregnancy rate increased 6% from 83% to 89%. The average calf age was increased by 76 days and approximately 87 pounds. In 2015, 2,280 cows weaned calves that weighed 530 pounds (1,051,308 total pounds). The value of each calf (\$151.96/cwt, average steer/heifer market, July 2017) can be estimated at \$805.39 or \$846,712,950 total. In 2016, on these same farms, 2,316 cows weaned calves that weighed 599 pounds (1,234,682 total pounds). If the value of each calf remains the same, then these cooperators weaned 183,374 more total pounds and revenue was increased \$278,655 total. Revenue increased \$2533.23 per cooperator even in a down market. Increased production efficiency, as a result of this program, increased gross revenue 26% for each producer.

In addition to these extension programs, I coordinate the UK IRM Committee and participate in the Master Cattleman Program and all other activities of this committee. I work extensively with the Kentucky Beef Network, the Governors Office of Ag Policy, and the Agriculture Development Board to obtain funding for beef extension programming.

Goals for Next Five Years

Teaching:

Continue my role as an instructor for ASC 406 and guest lecturer when asked.

Research:

Expand interests in use of gender-selected semen in commercial beef cow-calf enterprises with the goal of determine the economic viability of controlling gender in commercial beef operations.

Extension:

Continue to expand the IRM Farm Program. Long-term goal is to have 1,000 farms and 40,000 cows enrolled. Plan to write FACTS sheets and extension publications describing the impact of the program.

FACULTY RESUME (2011-2017)

Name: Jeffrey Bewley

Academic Rank: Associate Extension Professor

Year of First UK Appointment: 2008

Specialization: Dairy Systems Management

% DOE (6 yr avg): **Research:** 13

Extension: 58

Teaching: 29

Academic Background

	<i>Degree</i>	<i>Year</i>	<i>Institution</i>
1.	BS	1998	University of Kentucky
2.	MS	2000	University of Wisconsin-Madison
3.	PhD	2008	Purdue University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Southern American Dairy Science Association President
2. American Dairy Science Association Student Affiliate Division Advisor
3. NC2042 Regional Project Chair
4. NE1028 Regional Project Chair
5. Kentucky Association of State Extension Professionals President

Awards

1. American Dairy Science Association Foundation Scholar Award in Production
2. American Dairy Science Association Cargill Animal Nutrition Young Scientist Award
3. College of Agriculture Early Career Outstanding Teacher Award
4. American Dairy Science Association-Student Affiliate Division Outstanding Advisor
5. KY Association of State Extension Specialists Outstanding New Extension Faculty Award

Committees

1. American Dairy Science Association, Journal of Dairy Science, Editorial Board
2. Farm Animal Integrated Research (FAIR) 2012 Planning Committee
3. National Mastitis Council Research Committee
4. UK Animal and Food Sciences Department Chair Search Committee
5. UK College of Agriculture Dean Search Committee

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 10

Total number of graduate advisees: 21

Number of graduate students graduated: M.S.: 10 Ph.D.: 2

Number of graduate committees (excluding your students): M.S.: 4 Ph.D.: 1

Courses Taught (provide course number and semester taught)

ASC 420G Dairy Cattle Science, Fall 2011-2017

ASC 382 Livestock Production Principles, Fall 2010, Spring 2012, Spring 2013

ASC 205 Livestock, People, and Their Interactions, Fall 2011, Spring 2012

GEN 302 International Education Abroad, Summer 2012, 2014, and 2016

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 31	Invited Presentations: 109
Abstracts: 102	Fact Sheets:
Book Contributions: 1	Posters:
Conference Proceedings: 22	Popular Magazines: 10
Numbered Extension Publications: 10	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 66,850	As PI: \$ 303,775	As PI: \$ 1,854,270
As Co-PI: \$	As Co-PI: \$ 5,601,549	As Co-PI: \$
Subtotal: \$ 66,850	Subtotal: \$ 5,905,324	Subtotal: \$ 1,854,270

Total funding received: \$ 7,826,444

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

The primary objective of my applied, extension-driven research program is to integrate dairy cattle biology and physiology with economics, engineering, and decision sciences within research aimed at increasing dairy farm sustainability using a systems approach. A systems approach to dairy research incorporates general concepts of animal nutrition, reproduction, genetics, lactation physiology, animal behavior, nutrient management, business management, decision making theory, labor management, and risk management. We have developed internationally recognized programs in precision dairy, compost bedded pack barns, animal health economics, and milk quality management. These programs have resulted in significant extramural funding, invited presentations, and graduate and undergraduate research opportunities. Within the state, we have helped dairy producers address dairy facility opportunities and mastitis challenges. In addition, we have involved our dairy producers heavily in applied, on-farm research projects.

Goals for Next Five Years

Teaching:

I would like to develop two 500 level courses: (1) a course focused on big data management and analysis techniques for livestock operations and (1) a course focused on dairy cattle housing.

Research:

As Dr. Taraba retires, I would like to shift the focus of my research program away from compost bedded pack barns and back to freestall barns. We will continue to work heavily in precision dairy with more emphasis on heat stress and lameness.

Extension:

As the state gains more organic dairies and the percentage of Amish/Mennonite farms increases, I would like to develop more program opportunities for these clientele groups. I also hope to expand our on-farm extension programs in dairy facilities and precision dairy.

FACULTY RESUME (2011-2017)

Name: William L. Boatright

Academic Rank: Professor

Year of First UK Appointment: 1995

Specialization: Food Chemistry

% DOE (6 yr avg): **Research:** 77

Extension:

Teaching: 23

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	Ph.D.	1994	University of Arkansas
2.	M.S.	1992	University of Arkansas
3.	B.S.	1990	University of Washington, Seattle

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Food Science Club Advisor (2014-present)
2. Food Science Program Coordinator (2009-present)
3. Chair of Food Science Search Committees (Hicks Position 2015-2016) & (O'Leary 2014)
4. Assessment Officer for the Food Science Program, 2009-2015
5. Animal & Food Science Federal Excess Property Officer (2011-present)

Awards

1. University of Arkansas Distinguished Food Science Alumnus Award, 2013
- 2.
- 3.
- 4.
- 5.

Committees

1. Food Science program's Graduation Composition and Communication Committee, Chair
2. Promotion and Tenure Area Committee Member; Extension Title Series, 2017
3. University of Kentucky Patent Review Committee, 2017
4. Chair of the AFS Space Evaluation Committee 2015
5. Member of the AFS Commodity Council 2009-2016

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 3

Total number of graduate advisees: 2-postdoc

Number of graduate students graduated: M.S.: 0 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 2 Ph.D.: 8

Courses Taught (provide course number and semester taught)

Food Chemistry - FSC 434G Spring semester (even years)
Food Analysis - FSC 535 each Fall semester
Food Lipids - FSC 640 Spring semester every odd year (excluding 2015)
Special Problems in Food Science - FSC 395 (Fall 2016 & Spring 2017)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 8	Invited Presentations:
Abstracts: 4	Fact Sheets:
Book Contributions:	Posters:
Conference Proceedings:	Popular Magazines:
Numbered Extension Publications:	Patents/Genbank Register: 1
Reports of Progress:	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$ 407489	As PI: \$
As Co-PI: \$	As Co-PI: \$ 23997	As Co-PI: \$
Subtotal: \$	Subtotal: \$ 431786	Subtotal: \$

Total funding received: \$431786

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

The primary goal of my research program continues to focus on generating novel and nationally recognized discoveries that are both basic and practical in nature, and that can ultimately find a use in industrial applications. During 2011 to 2017 we had two active USDA NRI/AFRI research grants and obtained one U.S. patent. In August 2014, Dr. Rao Vadlamani from Campbell's contacted me based our previous accomplishments with flavor chemistry research and our success in developing practical solutions. After a great deal of negotiations and proposal modifications, we signed a research agreement between the Campbell's Soup Company and the University of Kentucky Research Foundation on May 15, 2015 for \$195,347. I have served as the assessment officer for our undergraduate food science program from 2009 to 2015, and in December 2014 we received our Institute of Food Technologists (IFT) re-accreditation, which is evaluated every five years. The availability of state of the art laboratory instrumentation is another strong aspect of our program. The incorporation of the GCCR and related assessment activity has been another major change that I played a major role in (for both the Food Science program as well as the Animal Science and Equine Science programs). I continue to be actively involved in coordinating activities with our current assessment officer and our undergraduate program coordinator. +

Goals for Next Five Years

Teaching:

To greatly expand the availability of Food Science undergraduate scholarship funding, and to use these funds to enhance the Food Science undergraduate program at UK.

Research:

Obtain NSF funding to support a start-up company that will successfully manufacture and sell a novel material that can be used to detect, quantify and visualize the presence of free radicals in real-time.

Extension:

n/a

FACULTY RESUME (2011-2017)

Name: Phillip Bridges

Academic Rank: Associate Professor

Year of First UK Appointment: 2006

Specialization: Reproductive Physiology

% DOE (6 yr avg): **Research:** 75.8

Extension: 0

Teaching: 24.2

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	Ph.D.	1999	West Virginia University
2.	M.S.	1995	University of Hawaii
3.	BSc.Agr	1992	University of Sydney

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. 2016/2017: Secretary of the NE-1227 Cooperative Regional Research Project
2. 2015/2016: Director of the NE-1227 Cooperative Regional Research Project
- 3.
- 4.
- 5.

Awards

1. 2014: Recipient of the College's Teaching Innovation and Incentive Fund (TIIF)
2. 2013: Recipient of the College's Early Career Outstanding Teacher Award
- 3.
- 4.
- 5.

Committees

1. 2014-2016: Member of the Society for the Study of Reproduction's Research Ethics Subcommittee
2. 2014-2016: Member of the Society for the Study of Reproduction's Publications Committee
3. 2014-2016: Member of two AFS Faculty Position Search Committees
- 4.
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 6-8/yr

Total number of graduate advisees: 1

Number of graduate students graduated: M.S.: 1 Ph.D.: 1

Number of graduate committees (excluding your students): M.S.: 2 Ph.D.: 6

Courses Taught (provide course number and semester taught)

ASC 364: Spring, 2011-2017

ASC/PGY 601: Fall, 2015

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 14	Invited Presentations: 4
Abstracts: 11	Fact Sheets:
Book Contributions:	Posters:
Conference Proceedings:	Popular Magazines:
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites): 6

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 37,044	As PI: \$ 100,000	As PI: \$
As Co-PI: \$ 230,000	As Co-PI: \$ 110,000	As Co-PI: \$ 94,000
Subtotal: \$ 267,044	Subtotal: \$ 210,000	Subtotal: \$ 94,000

Total funding received: \$571,044

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

My program of research has a dual focus, aiming to determine (1) trace mineral-regulated changes in reproductive function of cattle, and (2) the endocrine regulation of oviductal inflammation using mice. We have acquired extramural funding (NIH P01 HD0718175), industry funding (Kentucky Cattleman's Association) and internal funding (Univ of KY, VP of Research) to support these research goals. Our finding that the form of selenium supplied to the diet of cattle affects systemic progesterone has garnered industry recognition (featured in "Feed Navigator.com"). AFRI #2017-05455 (under review) proposes experiments that will explore how different forms of supplemental selenium can be used to increase fertility. I am currently secretary (formerly director) of the NE-1227 Multistate Research Program, which received the 2017 NE Award for Excellence in Multistate Research.

My primary teaching responsibility is ASC 364 (Reproductive Physiology of Farm Animals), which covers the basics of anatomy and physiology of reproduction. Historically, this class was offered in the Spring semester only. Due to increased demand, I am now instructing ASC 364 every semester. In 2013, I received the Early Career Outstanding Teacher Award for my efforts in this class.

Goals for Next Five Years

Teaching:

Continue improving/refining ASC 364. Develop new lab sections.

Research:

Increase acquisition of extramural funding which will allow training of new graduate students and maintain productivity. Potentially expand research focus to include more nutritional/reproductive aspects (cattle) and microbiome effects (mice).

Extension:

FACULTY RESUME (2011-2017)

Name: K. Darrh Bullock

Academic Rank: Extension Professor

Year of First UK Appointment: 1992

Specialization: Beef Genetics

% DOE (6 yr avg): **Research:**

Extension:

Teaching:

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	PhD	1992	University of Georgia
2.	MS	1988	Auburn University
3.	BS	1984	Auburn University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. CAFE Faculty Council
2. Extension Coordinator
3. Beef Group Coordinator
4. Beef Improvement Federation (BIF) Regional Secretary
5. National Beef Cattle Evaluation Consortium Board (NBCEC) Member and

Awards

1. American Society of Animal Sciences Extension Award (2015)
2. American Society of Animal Sciences Animal Industry Service Award (2017)
- 3.
- 4.
- 5.

Committees

1. AFS Awards Committee
2. NBCEC Chair Education Committee
3. BIF Board of Directors
4. BIF Program Committee
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees:

Total number of graduate advisees:

Number of graduate students graduated: M.S.: Ph.D.:

Number of graduate committees (excluding your students): M.S.: Ph.D.:

Courses Taught (provide course number and semester taught)

ASC 406 Beef Cattle Science (Fall 2011, Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles:	Invited Presentations: 16
Abstracts: 7	Fact Sheets: 13
Book Contributions:	Posters:
Conference Proceedings: 1	Popular Magazines: 25
Numbered Extension Publications: 8	Patents/Genbank Register:
Reports of Progress: 2	Other (e.g. websites): 11

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$ 447,754	As PI: \$
As Co-PI: \$	As Co-PI: \$ 1,478,268	As Co-PI: \$
Subtotal: \$	Subtotal: \$ 1,926,022	Subtotal: \$

Total funding received: \$1,926,022

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Recent Significant Accomplishments

- Developed and conducted the Pasture to Plate Program (see below).
- Member of a multi-state group that developed a Beef Genetics website called eBEEF.org.
- Secured almost \$2M in funds for Extension programming, of which \$447,754 I coordinate.
- Received the 2015 American Society of Animal Sciences Extension Award. The award is given annually to one recipient nationally. Since 1959, I am the fourth University of Kentucky faculty member to receive the award and the first since 1999.
- Received the 2017 American Society of Animal Sciences Animal Industry Service Award. The award is given annually to one recipient nationally.

Extension Accomplishments

The overall purpose of my Extension program is to improve the economic, social and physical wellbeing of Kentucky beef farmers through educational programs that are scientific +

Goals for Next Five Years

Teaching:

Continue team teaching the Beef Cattle Science course and pursue innovative ways for students to retain the information and solve problems.

Research:

I currently have no research appointment, however, I provide assistance and advise to our research faculty and will continue to do so, as needed.

Extension:

Continue to provide both basic and advanced educational programs for beef cattle farmers and ANR Agents. This will include current programs such as Master Cattleman, Applied Master Cattleman, Pasture to Place and traditional in-county and internet based educational programs +

FACULTY RESUME (2011-2017)

Name: Walter Roy Burris

Academic Rank: Extension Professor

Year of First UK Appointment: 1981

Specialization:

% DOE (6 yr avg): **Research:** 0

Extension: 100

Teaching: 0

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.S.	1969	Tennessee Technological University
2.	M.S.	1972	University of Kentucky
3.	Ph.D.	1974	University of Kentucky

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

- 1.
- 2.
- 3.
- 4.
- 5.

Awards

1. 2016 UK-CAFES Extension/Research Impact Award
2. Selected to speak to Chinese National Beef Symposium
- 3.
- 4.
- 5.

Committees

1. IRM Committee
2. University of Arkansas Review Committee
- 3.
- 4.
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees:

Total number of graduate advisees:

Number of graduate students graduated: M.S.: Ph.D.:

Number of graduate committees (excluding your students): M.S.: Ph.D.:

Courses Taught (provide course number and semester taught)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 6	Invited Presentations: 5
Abstracts: 21	Fact Sheets:
Book Contributions: 1	Posters:
Conference Proceedings: 1	Popular Magazines: 10
Numbered Extension Publications: 6	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites):

Funding Support (2011-2017)

<u><i>Internal – Competitive</i></u>	<u><i>External – Competitive</i></u>	<u><i>External – Gift</i></u>
As PI: \$ 50,000	As PI: \$	As PI: \$
As Co-PI: \$ 267,000	As Co-PI: \$ 648,329	As Co-PI: \$
Subtotal: \$ 317,000	Subtotal: \$ 648,329	Subtotal: \$

Total funding received: \$

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Served as member of a team that delivers Master Cattleman, Advanced Master Cattleman, Master Stocker, Master Grazer and Grazing School. Work with research team on mineral nutrition, endophyte in fescue in beef cattle. Oversee the beef herd and beef research and extension at the Princeton station.

Goals for Next Five Years

Teaching:

Research:

Get research herd and program ready to transition to next phase due to my retirement.

Extension:

Retirement

FACULTY RESUME (2011-2017)

Name: Fernanda Camargo

Academic Rank: Associate Extension Professor

Year of First UK Appointment: 2007

Specialization: Equine

% DOE (6 yr avg): Research:

Extension: 72.2

Teaching: 27.8

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	DVM	2000	State University of Londrina - Brazil
2.	PhD	2007	University of Kentucky
3.			

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Chair of the Equine Symposium of American Society of Animal Sciences: 2015, 2016, 2017
2. Chair Eastern Nationals 4H Horse Roundup, 2014-2015
3. Interim President International Society of Riders Biomechanics: 2013-2014
4. Eastern Nationals 4H Horse Roundup Board Member, Chair of Facilities, 2007-present
5. Kentucky Horse Council Board Member and Outreach Committee member

Awards

1. 2016 Outstanding Service Award for Eastern Nationals 4H Horse Roundup
2. 2017 A Teacher Who Made a Difference, UK College of Education
3. 2015 A Teacher Who Made a Difference, UK College of Education
- 4.
- 5.

Committees

1. College of Ag Equine Programs Council
2. Equine Science and Management Curriculum Committee
3. Kentucky Horse Council Outreach Committee
4. Search Committee for AFS and ESM instructor
5. Equine Programs Agents Working Group Committee

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 45

Total number of graduate advisees:

Number of graduate students graduated: M.S.: Ph.D.:

Number of graduate committees (excluding your students): M.S.: 2 Ph.D.:

Courses Taught (provide course number and semester taught)

ASC 310: Spring 2011, 2012, 2013, Fall 2014, 2015

EQM 351: Fall 2011, 2012, 2013 Spring 2014, 2015, 2016

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 2	Invited Presentations: 48
Abstracts: 4	Fact Sheets:
Book Contributions:	Posters: 1
Conference Proceedings: 4	Popular Magazines: 2
Numbered Extension Publications: 17	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites): 124

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$	As PI: \$ 193,050
As Co-PI: \$	As Co-PI: \$	As Co-PI: \$
Subtotal: \$	Subtotal: \$	Subtotal: \$

Total funding received: \$ 193,050.00

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Extension:

1. Under my leadership, Kentucky youth have been placing much better than ever before in the 4-H regional and national contests, and that is a result of the educational value these youth find in our program. In 2016, our Kentucky won the National Hippology Contest, which had never happened before.
2. The quality of the horses at the State Horse Show continue to improve, and that is a direct result of my diligent training of leaders and agents on Body Condition Scoring and how to help a horse gain or lose weight.
3. I have continued to secure sponsorship funding for the KY 4H Horse Program, receiving close to 200,000 between 2011 and 2016.
4. Starting in 2013, I secured a new source of scholarship funds for senior youth enrolled in the 4H Horse Program. The Race for Education currently awards up to \$25,000 each year to our youth (\$500 per youth) across the state.
5. The Horse Volunteer Certification Program continues to be a success. In 2013 and 2014 we held 4 workshops in different areas of the state. To date (since 2010) we have trained and certified over 350 horse volunteer leaders.
6. I chaired the committee for the second time to create the second Kentucky Equine Youth Festival, where over 2,500 school-aged students attended the event in 2013.
7. I organized the Horse Track for the Kentucky 4-H Volunteer Forum in 2012 and 2014 and had 21 sessions between the 2 events, and a total of 385 attendees, between Volunteer Leaders, 4-H Agents and Senior Youth. +

Goals for Next Five Years

Teaching:

I would like to have at least 2 or 3 hands on live labs/outings for Health and Disease. I would also like to develop different ways to evaluate the students' learning.

Research:

I would actually like to do some more applied research. I did some research about rider safety, together with other co-authors from Saddle up Safely. One of the articles has been published (2017), and I submitted another article for publication in September 2016, but it is still under +

Extension:

I am working toward recruiting more kids to participate in the 4H Horse Program. I am also trying to develop a 4H alumni program so bring people back to the state program maybe as volunteers, or just to have fun.

FACULTY RESUME (2011-2017)

Name: Richard Coffey

Academic Rank: Extension Professor

Year of First UK Appointment: 1994

Specialization: Department Chair

Average % DOE: Research:

Extension: 36%

Teaching:

Administration: 64%

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.S.	1986	Oklahoma State University
2.	M.S.	1990	Oklahoma State University
3.	Ph.D.	1994	University of Kentucky

Committees, Awards, Offices, etc. (list those you consider most prestigious first)

Elected/Appointed Offices

1. Chair, Department of Animal and Food Sciences (2015-present)
2. Director, University of Kentucky Research and Education Center (2012-2015)
3. President-Elect, Midwest Section American Society of Animal Science (2017-present)
4. College Extension Review Subcommittee on Organizational Structure (2016-present)
5. College Strategic Plan Implementation Team (2016-present)

Awards

1. Extension Award, Southern Section American Society of Animal Science (2011)
2. Hall of Fame, Kentucky Pork Producers Association (2015)
3. Honorary State FFA Degree, National FFA Organization (2011)
- 4.
- 5.

Committees

1. Midwest Section American Society of Animal Science Board of Directors
2. Papa John's International Animal Care Policy Development Team
3. Cargill Pork Animal Care and Use Committee for Sow and Grow-Finish Innovation Centers
4. Midwest Section American Society of Animal Science PhD Poster Competition Committee
5. National FFA Agriscience Fair Competition Committee

Teaching – Advising

Total number of undergraduate advisees: 0

Total number of graduate advisees: 0

Number of graduate students graduated: M.S.: 0 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 1 Ph.D.: 2

Courses Taught

Guest lectures for ASC 382 Livestock Production Principles and ASC 408G Swine Science

Teaching, Research or Extension Publications (*numbers only*)

AES Refereed Journal Articles: 0	Invited Presentations: 21
Abstracts: 0	Fact Sheets: 14
Book Contributions: 0	Posters: 0
Conference Proceedings: 1	Popular Magazines: 3
Numbered Extension Publications: 0	Patents/Genbank Register: 0
Reports of Progress: 4	Other (e.g. websites): 17

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 72,000	As PI: \$ 154,994	As PI: \$ 77,630
As Co-PI: \$ 0	As Co-PI: \$ 0	As Co-PI: \$ 0
Subtotal: \$ 72,000	Subtotal: \$ 154,994	Subtotal: \$ 77,630

Total funding received: \$ 304,624

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Major Extension accomplishments include (1) conducted programs/activities and applied research impacting the state's swine industry, (2) personal contacts to disseminate farm and individual specific information (monthly averages of 29 phone consultations, 20 printed responses, 12 office or face-to-face consultations, and 3 farm visitations) with producers and others with the swine industry, (3) co-coordinator of 4-H Livestock and Horse Volunteer Certification Program, and (4) statewide oversight of youth livestock programs as the department's Youth Programs Coordinator.

Major Chair accomplishments include restructuring the Business Office to better meet departmental needs and improve efficiency of operations, developed and implemented an Associate Chair position, successfully hired five new faculty members, updated departmental policies to comply with university purchasing guidelines, completed two 2-year faculty reviews, successfully guided two faculty promotion and tenure dossiers, worked with CAFE Development Office to finalize what will become an approximately \$3 million endowment for scholarships, and completed numerous facility and equipment upgrades.

Goals for Next Five Years

Teaching:

Complete curriculum review/mapping for Equine Science and Management and implement positive changes, and initiate curriculum review/mapping for Animal Sciences to improve course offerings. Consider adopting a peer evaluation of teaching.

Research:

Continue to support faculty and staff in the development and maintenance of competitive, multidisciplinary research programs that discover new information and solve problems. Continue identifying ways to maintain and make improvements to animal units at the farms.

Extension:

Continue to support faculty and staff in the development of programs and resources that positively impact clientele. Continue seeking new funding models to support important programs and activities.

FACULTY RESUME (2011-2017)

Name: Robert J. Coleman

Academic Rank: Associate Professor

Year of First UK Appointment: 1998

Specialization: Equine

% DOE (6 yr avg): **Research:**

Extension: 55

Teaching: 45

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	BsC	1975	University of Manitoba
2.	MS	1978	University of Manitoba
3.	PhD	1998	University of Alberta

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Executive Director Equine Science Society 2013 - present
2. Vice President Certified Horsemanship Association 2016 -present
3. President Kentucky Quarter Horse Association 2014 -2015
4. Chairman American Quarter Horse Foundation Research Committee 2016 - present
5. Director ARPAS Midwest region 2017

Awards

1. Advisor of the year awarded by the CAFE Student Council 2014
- 2.
- 3.
- 4.
- 5.

Committees

1. College of Agriculture Curriculum Committee
2. Kentucky Horse Council Finance Committee 2015 - present
3. North American International Livestock Expo Quarter Horse Committee 2016 - present
4. UK Representative on the Kentucky Equine Health and Welfare Council 2012 - present
5. Program Advisory Committee Kentucky Horse Shoeing School 2013 - present

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 375

Total number of graduate advisees: 2

Number of graduate students graduated: M.S.: 1 Ph.D.:

Number of graduate committees (excluding your students): M.S.: 1 Ph.D.: 2

Courses Taught (provide course number and semester taught)

EQM 490 Equine Capstone Fall 2011, Spring 2012, Fall 2012, Spring 2013, Fall 2013, Spring 2014, Fall 2014, Spring 2015(two sections), Fall 2015(two sections), Spring 2016 (two sections), Spring 2017 (two sections)

EQM 300 Facility Design and Management Spring 2014, 2015, 2016 and 2017

Gen 109 Tools and Tack in the Horse Industry Fall 2013, 2014 and 2015

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 6	Invited Presentations: 10
Abstracts: 19	Fact Sheets:
Book Contributions:	Posters: 2
Conference Proceedings: 6	Popular Magazines: 10
Numbered Extension Publications: 4	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites): 1

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 68,000	As PI: \$	As PI: \$ 30,000
As Co-PI: \$ 193557	As Co-PI: \$ 300,000	As Co-PI: \$ 10,000
Subtotal: \$ 261557	Subtotal: \$ 300,000	Subtotal: \$ 40,000

Total funding received: \$ 601557

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Served as the Director of Undergraduate studies till spring of 2017. During this time the program has grown to one of the largest in College of Agriculture, Food and Environment. This program is strongly supported by the department and attracts a student population that is over 60% out of state students. The program is one of three similar stand alone programs at land grant schools.

While not having a formal research appointment working on a project with the University of Minnesota resulted in the development of an APP for horse owners to use to estimate not only their horses current bod weight but also to estimate their horse's ideal body weight. This process was based on morphometric measures not used in the past and has resulted in a program that covers a major segment of the horse industry. Breeds such as the miniature horse, the American Saddlebred, Morgan, Tennessee Walking horse along with Draft horses and the typical Stock horse breeds have been included in the APP. For many this is the first time measurements have been made on these horses and included in a management tool as the APP. The APP is currently available to horse owners on Apple and Android platforms.

Goals for Next Five Years

Teaching:

To develop the courses currently taught to meet the needs of the ESMA program and the undergraduate taking them. Two of the courses are offered without a permanent number and This will be changed in the next year

Research:

To use the time from my sabbatical (fall 2016) to pursue research in the area of the Equine fecal Microbiome looking at how management and nutrition can impact the fecal microbiome and the health of the horse.

Extension:

The new program called Master Horse Owner was launched in the spring of 2017. The aim of this extension program is to bring an educational program to horse owners across the state in a more flexible manner. In the past a program was offered with a rather standardized format. The new program will be delivered in a manner it include more topics that will meet the needs of the horse owners.

FACULTY RESUME (2011-2017)

Name: Joao H. C. Costa

Academic Rank: Assistant Professor

Year of First UK Appointment: 2017

Specialization: Dairy Science

% DOE (6 yr avg): **Research:** 70

Extension:

Teaching: 25

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	PhD	2015	University of British Columbia (UBC)
2.	MSc	2012	Federal University of Santa Catarina (UFSC)
3.	BSc	2009	Federal University of Santa Catarina (UFSC)

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

- 1.
- 2.
- 3.
- 4.
- 5.

Awards

1. HAYNES Graduate Scholarship for the Advancement of Animal Welfare
2. The Emerging Leaders in the Americas Program (ELAP)
3. C. W. Roberts Jr. Memorial Award
- 4.
- 5.

Committees

- 1.
- 2.
- 3.
- 4.
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 10-UBC

Total number of graduate advisees: 2-UBC

Number of graduate students graduated: M.S.: 2 -UBC Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 2 Ph.D.: 2

Courses Taught (provide course number and semester taught)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 12	Invited Presentations: 5
Abstracts: 28	Fact Sheets: 0
Book Contributions: 0	Posters: 7
Conference Proceedings:	Popular Magazines: 6
Numbered Extension Publications: 2	Patents/Genbank Register:
Reports of Progress: 1	Other (e.g. websites): 0

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 0	As PI: \$ 0	As PI: \$ 0
As Co-PI: \$ 0	As Co-PI: \$ 0	As Co-PI: \$ 0
Subtotal: \$ 0	Subtotal: \$ 0	Subtotal: \$ 0

Total funding received: \$0

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

During this period I was mainly at the University of British Columbia as a PhD student (2012-2015) and as a Post-Doctoral Fellow (2015-2017). Over the course of the period I have instructed an undergraduate research methodology course and held several teaching assistant positions. I have also mentored 10 undergraduate students and collaborated with another 4 graduate students. In extension, I conducted 3 farmer oriented workshops on lameness control and the economics of cow comfort. Additionally, I participated in the planing of many farm tours, open houses, and seminar presentations in diverse industry and farmer conferences in Brazil and Canada. In the last 5 years I have published 12 refereed scientific journal publications, including an Invited Review. The majority of these being published in either the Journal of Dairy Science (current impact factor: 2.573; five-year impact factor: 3.071) or the open access journal PLoS ONE (current impact factor: 3.234; five-year impact factor 3.70).

Goals for Next Five Years

Teaching:

- 1- Develop a graduate level course in Applied Animal Behavior and Welfare
- 2- Teach the class: ASC 382: Livestock Production Principles
- 3- Participate in the teaching and organizing of the class: ASC 420G: Dairy Cattle Science

Research:

- 1-Create and support with external funding a research program focused on dairy science, with emphasis on applied animal behavior and welfare and nutrition.
- 2-Attract, recruit and complete the graduate studies of 4 students.
- 3-Publish over 10 refereed publications in scientific journals

Extension:

- 1- Identify and develop relationship with leaders of the dairy industry in Kentucky and beyond.
- 2-Participate in the dairy extension activities and committees.
- 3- Organize a workshop on the raising of replacement animals for Kentucky dairy farmers.

FACULTY RESUME (2011-2017)

Name: Roberta M. Dwyer

Academic Rank: Professor

Year of First UK Appointment: 1989

Specialization: Epidemiology, Biosecurity

% DOE (6 yr avg): **Research:** 0

Extension: 30

Teaching: 70

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	DVM	1985	Iowa State University
2.	MS	1990	University of Kentucky
3.		1993	Board Certified, Am College of Veterinary Preventive Medicine

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Invited member of outside reviewers for the National Food and Agricultural Incident Annex⁺
2. Invited subject matter expert for the American Association of Equine Practitioners in Biosec⁺
3. Director of Undergraduate Studies, UK Pre-Veterinary
- 4.
- 5.

Awards

1. Student nominated for 2016 Ken Freedman Outstanding Advisor Award; 2nd runner up for ⁺
2. 2013 University of Kentucky Great Teacher Award (student nominated)
3. 2011 Joe T. Davis Outstanding Advisor Award (student nominated; UK College of Agricult⁺
- 4.
- 5.

Committees

1. Core Planning Team for the Multi-Jurisdictional Animal Resource Coordination Exercise, a⁺
2. Appointed by the President to the UK Sexual Misconduct Hearing Panel (2015-2017)
3. UK Equine Programs Curriculum Committee and Steering Committee (2012-present)
4. Kentucky Council on Postsecondary Education Pre-veterinary advisory Committee (1990-pr⁺
5. Search committee for new preveterinary academic coordinator (Spring 2016)

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 400

Total number of graduate advisees: 0

Number of graduate students graduated: M.S.: 0 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 2 Ph.D.: 2

Courses Taught (provide course number and semester taught)

ASC 209 Veterinary Medical Terminology, Spring 2017, Spring 2016

EQM 490 Capstone in Equine Science & Management, Fall 2016

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 0	Invited Presentations: 9
Abstracts: 0	Fact Sheets: 0
Book Contributions: 2	Posters: 0
Conference Proceedings: 6	Popular Magazines: 7
Numbered Extension Publications: 0	Patents/Genbank Register: 0
Reports of Progress: 0	Other (e.g. websites): 6

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$	As PI: \$
As Co-PI: \$	As Co-PI: \$ 135781	As Co-PI: \$
Subtotal: \$	Subtotal: \$ 135781	Subtotal: \$

Total funding received: \$135781

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

I began my UK career in 1989 in the Department of Veterinary Science. In January 2016 I became a full time faculty member in the Department of Animal and Food Sciences. Therefore, I've included information on this form of activities primarily since January 2016.

I was the only preveterinary (PV) advisor at UK until September 2016 when the first academic coordinator for PV advising was hired. Colette Tebeau, MS has been trained to work with freshmen and sophomore PV students and is also in charge of recruiting and student data summaries. I continue to work with upperclassmen and all students applying to veterinary schools in North America and abroad.

Dr. Melissa Newman and I developed a new online veterinary medical terminology course, ASC 209, that has been quite successful and popular among students across the UK campus. I taught the Equine Capstone class while Dr. Coleman was on sabbatical, and will teach a new course (for me), the Animal Science capstone course in Spring 2017. I routinely give 3-5 guest lectures each semester in ASC, EQM, and FSC courses.

Equine biosecurity is an important topic internationally, and I provide consultations, lectures, and written materials on the topic from a variety of angles to a variety of audiences. In 2016 I provided subject matter expertise in the first publication of its kind: "Safety on the Farm: A +

Goals for Next Five Years

Teaching:

I will be teaching ASC 470 Capstone for Animal Ag in Spring 2017 and will endeavor to instill in students critical thinking, communication, and professionalism skills in this class and the others that I instruct. For preveterinary advising, my goals are to enhance the 4-year +

Research:

Future research efforts will center on providing epidemiology expertise to ongoing departmental research and graduate student education. Publications are planned on data from two national-level animal disaster exercises and translational research on biosecurity practices. +

Extension:

Providing biosecurity consultations for farms, veterinary clinics, and event venues will continue to be critical with current equine infectious disease issues. I am working on expanding the biosecurity videos already available on the internet with new ones emphasizing +

FACULTY RESUME (2011-2017)

Name: Donald G. Ely

Academic Rank: Professor

Year of First UK Appointment: 1968

Specialization: Ruminant Nutrition

% DOE (6 yr avg): **Research:** 30

Extension: 30

Teaching: 40

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.S.	1961	Oklahoma State University
2.	M.S.	1965	Oklahoma State University
3.	Ph.D.	1966	University of Kentucky

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Chair, Robert Hall Nomination Committee Saddle and Sirloin Club, NAILE
2. Member, Departmental Awards Committee, 2011-17
3. Editorial Board, Hoofprint: The Small Ruminant Magazine, 2011-17
- 4.
- 5.

Awards

1. Animal Industry Service Award, ASAS, 2013
2. Research Activity Award, UK College of Agriculture, 2012
3. UK Gamma Sigma Delta Graduate Student Advisor Award, 2011
- 4.
- 5.

Committees

1. Selection Committee, Animal Industry Service Award, ASAS, 2014
2. Member, Production, Management, and Environment Program, ASAS, 2014-2016
3. Selection Committee, Animal Physiology and Environment Award, ASAS, 2015-2017
4. Member/Chair, Necrology Committee, Southern Section ASAS, 2013-2017
5. NCERA-214 Coordinating Committee (Increased Efficiency of Sheep Production) 2011-17

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 11

Total number of graduate advisees: 4

Number of graduate students graduated: M.S.: 3 Ph.D.: 1

Number of graduate committees (excluding your students): M.S.: 2 Ph.D.: 0

Courses Taught (provide course number and semester taught)

ASC 102: Introduction to Livestock and Poultry Production, Spring, 2011-2017

ASC 404G: Sheep Science, Fall, 2011-2017

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 0	Invited Presentations: 16
Abstracts: 7	Fact Sheets: 0
Book Contributions: 0	Posters: 1
Conference Proceedings: 1	Popular Magazines: 26
Numbered Extension Publications: 3	Patents/Genbank Register: 0
Reports of Progress: 0	Other (e.g. websites): 0

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 91,782	As PI: \$ 0	As PI: \$ 0
As Co-PI: \$ 64,782	As Co-PI: \$ 6,035	As Co-PI: \$ 6,000
Subtotal: \$ 156,564	Subtotal: \$ 6,035	Subtotal: \$ 6,000

Total funding received: \$168,599

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

TEACHING: Operated under philosophy "If the student fails to learn, the teacher fails to teach." In ASC 102 (Introduction to Livestock and Poultry Production), subject matter is updated each semester and taught to maximize instructor/student interaction. ASC 404G (Sheep Science) applies the principles of genetics, reproduction, nutrition and fiber production through classroom and lab interactive instruction.

EXTENSION: Three Eweprofit Schools (5 hours instruction per school) plus a Lambing and Shearing school per year have been continued through 2011-17. All are designed for new and prospective sheep producers and are taught at the C. Oran Little Animal Research Center Sheep Unit. A Small Ruminant Profit School was developed in 2014 by the KY Sheep and Goat Development Office, University of Kentucky, Kentucky State University, and KY Department of Agriculture.

RESEARCH: Emphasis is placed on ewe management strategies for increasing lean lamb production. A low input production system has been developed. Hair sheep germplasm [White Dorper (WD)] has been incorporated into a flock of wool sheep [Polypay (PP)]. Results show WD ewes are as productive as PP and ewes rearing twins, regardless of breed, are more susceptible to stomach worm infestations than those with singles. Production of 600 lb marketable product per acre, from lambs born to these ewes in April, is attainable by grazing alfalfa and supplementing with concentrate until marketing in October. Copper sulfate is an effective dewormer for these lambs.

Goals for Next Five Years

Teaching:

Continue to challenge undergraduates to learn animal and food service subject matter. Maintain a continual surveyance of student characteristics and work to relate to them so learning can continue to occur.

Research:

To fill a niche between discovery ruminant nutrition research and producer application, especially as applied to forage utilization in low input production systems. Control of internal parasites under intensive grazing of legumes will be emphasized.

Extension:

Continue to conduct Eweprofit, Lambing and Shearing Schools each year and motivate clientele to develop a profitable sheep enterprise. Expand Small Ruminant School and further develop the Wool Pool initiated in 2016.

FACULTY RESUME (2011-2017)

Name: David L. Harmon

Academic Rank: Professor

Year of First UK Appointment: 1991

Specialization: Ruminant Nutrition

% DOE (6 yr avg): **Research:** 56

Extension:

Teaching: 24

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.S.	1978	The Ohio State University
2.	M.S.	1980	University of Nebraska
3.	Ph.D.	1983	University of Nebraska

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Director of Graduate Studies - AFS (2002-2017)
2. Beef Unit Faculty Coordinator - 2011-2017
3. Animal Lab Faculty Coordinator - 2011-2017
- 4.
- 5.

Awards

1. American Society of Animal Science - Research Fellow 2012
- 2.
- 3.
- 4.
- 5.

Committees

1. NSERC of Canada- Review Panel Member - 2011-2013
2. Chair, Expert Committee for the Canada Foundation for the 2017 Innovation Fund
3. Graduate Activities Committee - 2011-2017
4. Department Chair Search - 2014
5. Dairy Faculty Position - 2017

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 20

Total number of graduate advisees: 13

Number of graduate students graduated: M.S.: 4 Ph.D.: 4

Number of graduate committees (excluding your students): M.S.: 3 Ph.D.: 2

Courses Taught (provide course number and semester taught)

ASC 680 Laboratory Methods in the Nutritional Sciences (4) - Fall Semester 2011-2017

ASC 684 Advanced Ruminant Nutrition (3) - Spring Semester 2017

ASC 388 Companion Animal Nutrition (3) - Spring Semester 2011-2017

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 36	Invited Presentations: 4
Abstracts: 31	Fact Sheets:
Book Contributions:	Posters:
Conference Proceedings:	Popular Magazines:
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 56,942	As PI: \$ 1,105,823	As PI: \$ 32,000
As Co-PI: \$	As Co-PI: \$ 90,000	As Co-PI: \$
Subtotal: \$ 56,942	Subtotal: \$ 1,195,823	Subtotal: \$ 32,000

Total funding received: \$1,284,765

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Research. My personal goals have always focused on graduate student training. Research training is very much a group effort and I serve as coordinator of the beef nutrition group. My role as Director of Graduate Studies (20% appointment) for the department is another aspect of my commitment to graduate education. I am pleased that we have made a number of revisions to the administration of our graduate program in the past year that I believe will strengthen our program in the future. I believe my research program is characterized by excellent breadth and quality research that results in publications in the top agricultural journals. My research has been supported by numerous private, commercial and government funding sources. **Teaching.** I have taught ASC 680 (Lab Methods) since 1992. It serves as the traditional first semester course for most new graduate students. Since 2011 I have developed and taught ASC 388 (Companion Animal Nutrition). This is an advanced undergraduate nutrition elective in our department. In spring 2017, I coordinated ASC 684 (Advanced Ruminant Nutrition). There were five faculty involved and I taught approximately 1/3 of the lectures. It is my plan that 680 and 388 will be offered yearly and 684 will be on an alternate year basis.

+

Goals for Next Five Years

Teaching:

Continue and improve current course offerings.

Research:

Complete current projects focusing on completing current Ph.D. students. Recruit new post-doc in coming year.

Extension:

FACULTY RESUME (2011-2017)

Name: George Heersche, Jr.

Academic Rank: Professor

Year of First UK Appointment: 1978

Specialization: Dairy Extension

% DOE (6 yr avg): **Research:**

Extension: 100

Teaching:

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	BS	1970	Kansas State University
2.	MS	1973	Kansas State University
3.	PhD	1975	Kansas State University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

- 1.
- 2.
- 3.
- 4.
- 5.

Awards

1. NAILE Dairy Judging High Individual Award established to honor my service.
2. Kentucky FFA Honorary State Farmer Degree
- 3.
- 4.
- 5.

Committees

1. Chair, National 4-H Dairy Cattle Judging Contest Management Committee
2. Co-Superintendent, NAILE Dairy Cattle Judging Contests
3. Chair, AFS Hall of Fame Award Committee
4. Garland Bastin Scholarship Committee
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 0

Total number of graduate advisees: 0

Number of graduate students graduated: M.S.: 0 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 3 Ph.D.:

Courses Taught (provide course number and semester taught)

Faculty advisor for the graduate student teaching ASC 321 and ASC 323, and have team taught ASC 321 and ASC 323 in the Spring and Fall semesters.

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 5	Invited Presentations: 15
Abstracts: 10	Fact Sheets:
Book Contributions:	Posters:
Conference Proceedings:	Popular Magazines: 35
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites): 24

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$	As PI: \$ 50,000.00
As Co-PI: \$	As Co-PI: \$	As Co-PI: \$
Subtotal: \$	Subtotal: \$	Subtotal: \$ 50,000.00

Total funding received: \$50,000.00

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

- Provide advice to farmers, Extension agents, and industry persons on dairy cattle reproduction.
- Assist Dairy Extension Associate with planning and conducting multiple 4-H educational events each year.
- Serve on three Masters Committees
- I am chairman of the National 4-H Dairy Cattle Judging Contest Management Committee, and I serve as co-superintendent of the dairy cattle judging contests at the NAILE. Both of these are high profile educational events which bring recognition to the University of Kentucky College of Agriculture, Food and Environment.
- I have helped several Spencer County FFA teams prepare for The National FFA Dairy Cattle Evaluation and Management CDE. This event has a portion where the team has to evaluate the production practices of a hypothetical dairy farm and suggest changes to rectify the weaknesses. I am involved in teaching the teams about proper dairy cattle management practices. Spencer County has had the National Champion FFA Dairy Cattle Evaluation and Management Career Development Event team five of the last six years.

Goals for Next Five Years

Teaching:

Continue to be the faculty advisor for the graduate student teaching ASC 321 and ASC 323.

Research:

Serve on graduate committees when asked.

Extension:

Continue current involvement.

FACULTY RESUME (2011-2017)

Name: Camie Heleski

Academic Rank: Senior Instructor

Year of First UK Appointment: 2016

Specialization: Equine; Behavior - Welfare

% DOE (6 yr avg): Research:

Extension:

Teaching: 100%

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	Ph.D.	2004	Michigan State University
2.	M.S.	1992	Michigan State University
3.	B.S.	1988	Michigan State University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Honorary President, International Society for Equitation Science
2. Junior Vice President, International Society for Equitation Science
3. Procedural Advisor, International Society for Equitation Science
- 4.
- 5.

Awards

1. 2012, AVMA Humane Award for a Non-Veterinarian
- 2.
- 3.
- 4.
- 5.

Committees

1. Scientific Committee Chair, NFACC – Code of Practice for the Care & Handling of Equines
2. Liaison to the Industry Committee, NFACC - Code of Practice...Equine
3. University of Kentucky, CAFE Education Abroad committee member
4. Michigan State University, ANS/CVM International Programs Steering Committee
5. Scientific Committee - International Society for Equitation Science

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 27 - UK

Total number of graduate advisees: 1

Number of graduate students graduated: M.S.: 2-MSU Ph.D.: 3-MSU

Number of graduate committees (excluding your students): M.S.: 2-MSU Ph.D.: 1-MSU

Courses Taught (provide course number and semester taught)

UK: Fall 2016: ASC 310; EQM 106; EQM 300, sec 003/ASC 333, sec 005

Spring 2017: EQM 106; EQM 101; EQM 301; EQM 300, sec 002; helped w EQM 105

MSU: Animal Welfare Assessment, Equine Exercise Physiology, Horse Behavior,

Horsemanship, Horse Selection and Evaluation, Placement Seminar, Internships

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 10	Invited Presentations: 11
Abstracts: 24	Fact Sheets:
Book Contributions: 2	Posters: 10
Conference Proceedings: 24	Popular Magazines: 8
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites): 4

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 7200	As PI: \$ 1500	As PI: \$ 18000
As Co-PI: \$	As Co-PI: \$ 26000	As Co-PI: \$ 2500
Subtotal: \$ 7,200	Subtotal: \$ 27,500	Subtotal: \$ 20,500

Total funding received: \$55,200

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Focusing on this past year while at University of Kentucky:

Teaching - Came to UK with the plan of reinvigorating courses I was teaching; attended CELT workshops to enhance pedagogical approaches. Worked to engage students as much as possible in coursework. Conducted pre-tests so as to have a basis for comparison; worked on refining learning outcomes and devising additional rubrics; thinking about how outcomes assessments can be incorporated. In terms of academic enrichment experiences, with support from UK's infrastructure, I was able to plan & implement an Education Abroad experience to Ireland/Northern Ireland. I have begun the process of working with undergrads on research experiences related to horse behavior and welfare.

Advising - Worked on learning the advising tools & information relevant to UK students in the Equine Science & Management major.

Research and Outreach - I am just now beginning to work on some undergrad projects related to off the track Thoroughbreds. One element that is often criticized about equine science research is that the messages don't get out to the lay people. This job has provided an opportunity to provide expertise to several horse magazines and websites.

Goals for Next Five Years

Teaching:

-add to & improve each course every year. -want to more fully utilize hands-on learning aspects. -plan to lead an Education Abroad experience each year, perhaps with different countries. Plan to continue working with a small number of undergrads on research projects.

Research:

Where undergrad students can be incorporated into meaningful research experiences, I hope to continue projects related to equine behavior, equine welfare, and horse-human interactions.

Extension:

Though I do not have an Extension appointment, I believe that all of us have a fundamental responsibility to serve in various outreach capacities.

FACULTY RESUME (2011-2017)

Name: Bernhard Hennig

Academic Rank: Professor

Year of First UK Appointment: 1984

Specialization: Nutrition/Toxicology

% DOE (6 yr avg): **Research:** 90%

Extension: 0%

Teaching: 10%

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	BS	1977	San Francisco State University
2.	MS	1979	Colorado State University
3.	PhD	1982	Iowa State University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Member, NIEHS/NIH grant review panels
2. Editor-In-Chief, Journal of Nutritional Biochemistry
3. Director, University of Kentucky Superfund Research Center
4. External Advisory Boards (University of Iowa SRC, Florida State Univ., Univ of Louisville)
- 5.

Awards

1. Multi-year NIEHS/NIH P42 (Superfund Research Center) awards
2. University of Kentucky Research Professorship Award
3. Fulbright Specialist Roster member
4. NIEHS/NIH R13 funding; co-organizer of two international conferences
5. Thomas Poe Cooper Research Award for Outstanding Research in Agriculture

Committees

1. Member; Search Committee, Executive Director, Proposal Development Office, 2016
2. Member; Search Committee, Associate Director, Proposal Development Office, 2017
3. Member; University of Kentucky Research Building 2 Advisory Committee, 2015-2017
4. Member; CAFÉ Selection Committee for University Research Professor; 2016-present
5. Member; Promotion and Tenure Committee; 2013-2018

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 3

Total number of graduate advisees: 7

Number of graduate students graduated: M.S.: 0 Ph.D.: 7

Number of graduate committees (excluding your students): M.S.: 0 Ph.D.: 15

Courses Taught (provide course number and semester taught)

Nutritional Biochemistry

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 31	Invited Presentations: 22
Abstracts: 40	Fact Sheets:
Book Contributions: 1	Posters:
Conference Proceedings:	Popular Magazines:
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$ over 20 million	As PI: \$
As Co-PI: \$	As Co-PI: \$ 176,353	As Co-PI: \$
Subtotal: \$	Subtotal: \$ over 20 million	Subtotal: \$

Total funding received: \$over 20 million

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Until recently, I was the full-time instructor of the course NFS/DHN 311 (Nutritional Biochemistry). In addition, I have given several guest lectures, such as in an honors course in Toxicology and Cancer Biology.

I received several NIH grants, which includes over 20 million in NIH funding to support our NIEHS/NIH P42 grant. This Center grant provides extramural funding for scientists from five UK colleges and 15 departments.

I received the University of Kentucky Research Professorship Award in 2013. In addition to being the keynote speaker at several national/international conferences, our research and a recent manuscript were featured in NIH/NIEHS publications or websites. Also, I continue to serve on national grant review panels, and I reviewed several dossiers for promotions and/or awards of colleagues from other institutions.

Goals for Next Five Years

Teaching:

I anticipate giving some guest lectures, and I will continue to advise graduate students and postdoctoral scholars.

Research:

I am currently the Director of the NIEHS/NIH-funded UK Superfund Research Center. We are already in the planning phase of the next competing renewal of our NIEHS/NIH P42 (due fall of 2018), which includes a workshop this fall with NIH administrators and members of our

Extension:

FACULTY RESUME (2011-2017)

Name: Mieke Holder

Academic Rank: Assistant Research Professor

Year of First UK Appointment: April 2016

Specialization: Environmental Impact: Grazing

% DOE (6 yr avg): **Research:** 100

Extension:

Teaching:

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.Sc.	2004	University of Pretoria; South Africa
2.	M.Sc.	2007	University of Pretoria; South Africa
3.	Ph.D.	2012	University of Kentucky; USA

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. none
- 2.
- 3.
- 4.
- 5.

Awards

1. Award recipient at AFSGA poster competition in 2011 and 2012 as PhD student
- 2.
- 3.
- 4.
- 5.

Committees

1. none
- 2.
- 3.
- 4.
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees:

Total number of graduate advisees:

Number of graduate students graduated: M.S.: Ph.D.:

Number of graduate committees (excluding your students): M.S.: Ph.D.:

Courses Taught (provide course number and semester taught)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 5 (1)	Invited Presentations:
Abstracts: 11	Fact Sheets:
Book Contributions: (1)	Posters: 6
Conference Proceedings:	Popular Magazines: 2
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites): 2

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$	As PI: \$ 75 000
As Co-PI: \$	As Co-PI: \$	As Co-PI: \$
Subtotal: \$	Subtotal: \$	Subtotal: \$

Total funding received: \$75000

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Publications: This period overlaps with the last 2 years of my Ph.D. as Graduate Research Assistant in this Department. I have included the publications associated with those two years above.

Publications in brackets denotes those currently “in preparation” to be submitted in 2017.

Research program development: Since my employment as faculty member in April 2016, I have been working on establishing a new research program. My focus has been on generating preliminary data that can be used for grant application purposes.

My top priority has thus been the development and validation of a novel “*In vitro* manure leaching model” for use as a tool in future environmental impact studies. The validation process has recently been completed. A second goal has been to explore the concentrations of trace element levels (heavy metals in particular) in horse hair as a more accurate reflection of exposure levels than blood levels alone. This is an ongoing project with the goal to potentially use horses as a model for pollution bio-monitors due to their close association with urban areas and humans.

Research collaborations: As a new faculty member, forming new collaborations with researchers has been very important to me. Thus far, in addition to researchers within the Department, I have been able to form active collaborations with researchers in the Plant and Soil Sciences Department and at The University of Delaware. More outside collaborations are in progress.

Goals for Next Five Years

Teaching:

Occasional guest lectures

Research:

Successful grant applications in the area of 'precision pasture supplementation strategies' that minimize mineral excretion. Appointment of graduate students. Incorporate an undergraduate research program that will allow research presentation opportunities at meetings. +

Extension:

Collaboration with extension faculty/agents for small scale on farm research projects to validate the applicability of research findings from this program.

FACULTY RESUME (2011-2017)

Name: Elizabeth A. James

Academic Rank: Lecturer

Year of First UK Appointment: 2008

Specialization:

% DOE (6 yr avg): **Research:** 0

Extension: 0

Teaching: 75

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	BS	2002	University of Nebraska - Lincoln
2.	MS	2006	University of California - Davis
3.	PhD	In-progress	University of Kentucky

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Equine Programs Council - 2011 - present
2. Equine Initiative Executive Committee - 2009-2011
3. Volunteer Coordinator, Kentucky Equine Youth Festival, 2012
- 4.
- 5.

Awards

1. Teacher Who Made a Difference Award, UK College of Education, 2014
2. Inducted into Kappa Delta Pi, International Education Honor Society, 2013
3. Inducted into Gamma Sigma Delta, Honor Society of Agriculture, 2013
- 4.
- 5.

Committees

1. ESMA Curriculum Committee, 2010-2014
2. Student Behavior Committee, ANS Department, 2012
3. ANFS Professional Advisor Planning Committee, 2012
4. Equine Initiative Strategic Planning Committee, 2010
5. Lecture Series Faculty Evaluation Committee, 2010

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 106

Total number of graduate advisees: 0

Number of graduate students graduated: M.S.: 0 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 0 Ph.D.: 0

Courses Taught (provide course number and semester taught)

EQM 101 (Fall 2008-2017); EQM 106 (Spring 2010-2015); EQM 205 (Fall 2010-2017)
GEN 100 (Fall & Spring 2009-2012); EQM 399 (Fall & Spring 2008-2017)
ANS 395 (Fall 2009, 2010, 2011, 2013, 2015, 2017; Spring 2009, 2010, 2012, 2014, 2016, 2017)
EQM 302 (Spring 2010-2017); EQM 301 (Spring 2011-2015); EQM 300 (Summer 2015)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 1	Invited Presentations: 12
Abstracts:	Fact Sheets:
Book Contributions:	Posters: 1
Conference Proceedings:	Popular Magazines:
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites): 22

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 1200	As PI: \$	As PI: \$
As Co-PI: \$ 500	As Co-PI: \$	As Co-PI: \$
Subtotal: \$	Subtotal: \$	Subtotal: \$

Total funding received: \$ 1700

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Created and organized the only Equine Specific Career Fair 2008-present
Created and organized the Equine Science and Management Program reception 2009 - present
Designed and taught 4 new EQM courses (Intro to Eq. Careers, Eq. Career Prep, Thoroughbred Sales, Equine Event Planning)

Goals for Next Five Years

Teaching:

Develop an internship preparation course that will better prepare students for their internship, increase the academic rigor of experiential learning, and produce a marketable internship portfolio.

Research:

Publish & present internship research from dissertation.

Extension:

FACULTY RESUME (2011-2017)

Name: Laurie Lawrence

Academic Rank: Professor

Year of First UK Appointment: 1992

Specialization: Equine Nutrition

% DOE (6 yr avg): **Research:** 80

Extension:

Teaching: 20

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	Ph.D.	1982	Colorado State University
2.	M.S.	1979	Colorado State University
3.	B.S.	1975	Cornell University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Board of Directors, National Association of Equine Affiliated Academics
2. Board of Directors, Kentucky Equine Management Internship Program
- 3.
- 4.
- 5.

Awards

1. American Feed Industry Association Equine Nutrition Research Award, 2015
2. Provost's Distinguished Service Professor, 2012
3. American Society of Animal Science Fellow Award, 2011
4. Gamma Sigma Delta G. Mitchell Award for Outstanding Service to Graduate Students, 2012
5. Kentucky Forage and Grassland Council Public Service Award, 2011

Committees

1. CAFE Promotion and Tenure Committee (2016-2018; Chair in 2017-2018)
2. CAFE North Farm User Committee, Chair, 2013-present
3. CAFE Equine Programs Council, 2011-present
4. Search Committees for DAFS Lecturer, North Farm Superintendent
5. DAFS Awards Committee and Animal Science Reunion Committee (2011-present)

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 10/year

Total number of graduate advisees: 12

Number of graduate students graduated: M.S.: 5 Ph.D.: 3

Number of graduate committees (excluding your students): M.S.: 5 Ph.D.: 3

Courses Taught (provide course number and semester taught)

ASC 688 - Fall 2014; ASC 410G - Spring 2016, 2017

ASC 389 - Spring 2011, 2012, 2013, 2014, 2015, 2016, 2017

ASC 311 - Fall 2013, 2014, 2015, 2016, 2017

Other: program coordinator for students from Master of Equine Science and Business Program who visit for 1 month each spring from AgrosupDijon in France.

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 17	Invited Presentations: 24
Abstracts: 40	Fact Sheets: 4
Book Contributions: 5	Posters:
Conference Proceedings: 5	Popular Magazines: 3
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress: 6	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 172,413	As PI: \$ 244,595	As PI: \$ 200,000 in kind
As Co-PI: \$ 72,000	As Co-PI: \$ 83,000	As Co-PI: \$
Subtotal: \$ 244,413	Subtotal: \$ 327,595	Subtotal: \$ 200,000 in kind

Total funding received: \$772,008

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Currently teach 3 undergraduate courses/year and one graduate course when enrollment warrants. ASC 389 "Applied equine nutrition and feeding" was developed as a new course during the review period. I advise the Horse Racing Club, undergraduate animal science students and organize the educational program for 6-10 French students each spring for 1 month. I do not hold an extension appointment but participate regularly in out-reach efforts including "Pastures Please", the Equine Breeders' Short Course and the Equine Farm and Facilities Expo. I have also given presentations to many producer/industry groups such as the Commercial Consignors and Breeders Association, the Jockey Club Welfare Summit, the National Convention of the Horseman's Benevolent and Protective Association and the Friesan Horse Society. In 2016 I chaired a committee to organize a nutrition short course for horse owners. My research has focused on forage evaluation with the goal of identifying chemical composition variables to develop a forage quality index specific to horses; factors affecting the equine gastrointestinal microbiome and factors affecting nutrient digestibility by horses. Exceptional graduate students have been attracted to the program and have been productive, first authoring 15 peer-reviewed publications in the review period including one that is in press.

Goals for Next Five Years

Teaching:

Continue to update and refine my courses to provide students with material they can apply post-graduation. In 2018 I will utilize a new format for ASC 389 to enhance student engagement and content acquisition.

Research:

Continue research relating to mare and foal nutrition with emphasis on the effect of maternal diet on foal growth and digestive development. Continue research on forage evaluation with the goal of developing an easy to apply index for compare hays intended for horses.

Extension:

Ensure that research results are translated to producers to enhance the management of horses in Kentucky.

FACULTY RESUME (2011-2017)

Name: Jeffrey W. Lehmkuhler

Academic Rank: Associate Professor

Year of First UK Appointment: 2008

Specialization: Beef Cattle Nutrition

% DOE (6 yr avg): **Research:** 0

Extension: 99

Teaching: 1

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	PhD	2001	University of Missouri
2.	MS	1999	University of Missouri
3.	BS	1996	Purdue University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. SERA 41 Beef Production Utilizing Forages in the Southeast Secretary 2011 & Chair 2013
2. Kentucky Beef Council Check-off Committee Research Chair - 2016 & 2017
3. Southern Section ASAS Extension Committee - Secretary 2011 & Chair 2013
4. KY Forage and Grasslands Board member
5. Mid-South Beef Stocker Association Board member

Awards

1. Southern Section ASAS Extension Award
- 2.
- 3.
- 4.
- 5.

Committees

1. ASAS Pasture and Forage Planning Committee - 2013-2015
2. American Grassfed Association Certification Standards Committee
3. Southern ASAS Industry Summit: Supplement Delivery Method program
4. KY Forage and Grasslands Board member
5. Kentucky Farm Service Agency Livestock Indemnity Program

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 0

Total number of graduate advisees: 0

Number of graduate students graduated: M.S.: 0 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 2 Ph.D.: 3

Courses Taught (provide course number and semester taught)

ANSC 382 Principles of Livestock Production - Spring Instructor 2015 & 2016

ANSC 406 Beef Cattle Science - Fall Co-teach w/ Dr. Bullock

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 1	Invited Presentations: 26
Abstracts: 11	Fact Sheets: 11
Book Contributions: 0	Posters: 0
Conference Proceedings: 13	Popular Magazines: 2
Numbered Extension Publications: 12	Patents/Genbank Register: 0
Reports of Progress: 0	Other (e.g. websites): 42

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$ 963659	As PI: \$
As Co-PI: \$	As Co-PI: \$ 908802	As Co-PI: \$
Subtotal: \$	Subtotal: \$ 1872461	Subtotal: \$

Total funding received: \$ 1,872,641

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

As a team, the UK IRM team has been very successful in obtaining external funding through KADF through the relationship with Kentucky Beef Network to fund the outreach efforts on pasture and beef cattle production. This allows for on-farm demonstrations to take classroom concepts and pull farmers to the next level showing them how to implement management practices on-farm. I've developed my own programs such as the Master Stocker program, Eden Shale Weaning Workshop program, and chair the Kentucky Beef Efficiency Conference held jointly with the Kentucky Cattleman's Association annual convention. I have strived to integrate with the team of specialists at UK inside and outside of my discipline. Hired in as 100% Extension, I have also accepted some teaching responsibilities for the department and served on graduate student committees. I have recently began reaching back into research and anticipate funding in 2018 from our USDA FAPRU partners. I am currently chairing the Kentucky Beef Council Check-off Research committee where I have developed and proposed an RFP to begin in 2018 if approved by the full board. These efforts were noted by my peers through the Southern ASAS Extension award.

Goals for Next Five Years

Teaching:

Continue to evaluate the use of technology into the classroom to improve the understanding of beef cattle management and nutrition principles to a student population further removed from the farm.

Research:

Would like to move back into research and graduate a Master's level student every 3 years.

Extension:

Evaluate alternative methods to deliver subject material as funds decline. Develop a backgrounding & finishing short course for the Southeast.

FACULTY RESUME (2011-2017)

Name: Merlin D. Lindemann

Academic Rank: Professor

Year of First UK Appointment: 1994

Specialization: Swine Nutrition

% DOE (6 yr avg): **Research:** 86

Extension: 0

Teaching: 14

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	BS	1977	University of Minnesota
2.	PhD	1981	University of Minnesota
3.			

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. National Animal Nutrition Program - chair of the Coordinating Committee (2016-2020)
2. Co-chair Local Steering Committee, 2012 Digestive Physiology of Pigs (DPP) int'l meeting
3. Int'l steering committee chairman, triennial DPP meetings (2012–2015)
4. Secretary/Vice-chair/Chair, S-1061 Southern Regional Sow Nutrition project (2014-2016)
5. Midwest Swine Nutrition Conference planning committee chairman (2010 - present)

Awards

1. 2017. University of Minnesota, Dept of Animal Sciences inaugural Golden Alumni Award
2. 2014. ASAS Cromwell Award in Mineral Nutrition
3. 2014. ASAS Research Fellow Award
4. 2015. Named one of four Masters of the Pork Industry by the National Hog Farmer
- 5.

Committees

1. 11th Subcommittee of NAS/NRC to revise the Nutrient Requirements of Swine (2010-2012)
2. Int'l Vitamin Advisory Board established by DSM (Basle, Switzerland) (2015-present)
3. UK Institutional Animal Care and Use Committee (2008 - present)
4. Established the Cromwell Award/Appreciation Club for Mineral Nutrition (2011)
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 20

Total number of graduate advisees: 8

Number of graduate students graduated: M.S.: 2 Ph.D.: 4

Number of graduate committees (excluding your students): M.S.: 5 Ph.D.: 4

Courses Taught (provide course number and semester taught)

ASC 378 (Principles of Animal Nutrition) Fall Semester, 2011-2014
ASC 685 (Mineral Metabolism) Spring semester, 2016
ASC 686 (Advanced Nonruminant Nutrition) Spring semester, 2016
ASC 687 (Vitamin Metabolism) Spring semester, 2017

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 27	Invited Presentations: 75
Abstracts: 31	Fact Sheets: 0
Book Contributions: 0	Posters: 0
Conference Proceedings: 14	Popular Magazines: 2
Numbered Extension Publications: 0	Patents/Genbank Register: 0
Reports of Progress: 0	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$ 299,079	As PI: \$ 1,229,280
As Co-PI: \$	As Co-PI: \$ 373,798	As Co-PI: \$
Subtotal: \$ 0	Subtotal: \$ 672,877	Subtotal: \$ 1,229,280

Total funding received: \$1,902,157

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Teaching - I transitioned from teaching a large undergraduate class to 3 smaller graduate student classes. This required significant effort to revise/update the 3 courses and it also required a change in the style of teaching from a rather traditional didactic lecture style to a more informal interactive style. The UK swine unit is providing/selling bred sows to the Univ. of Tennessee for their swine production class each fall and spring; this has also resulted in a research collaboration.

Research - Novel areas of study - superdosing of enzymes (and validation of new enzymes) for improved feed utilization and removal of antinutrients in feedstuffs, essential oils as alternative to antibiotics, biologically active peptides, application of nanotechnology to mineral bioavailability. Additional areas of study involve mycotoxin-contaminated feedstuffs, factors affecting birth weight in pigs, development of internal organs and gastrointestinal length and volume (i.e., digestive capacity) in growing pigs. Some research has contributed to basic biological and anatomical information for the pig. Others are contributing to the economic & environmental sustainability of swine production. An example of economic value for one of our enzyme studies, assuming a 40% adoption rate by the US swine industry would equate to annual savings of > \$345,000,000.

Outreach - The majority of my invited presentations were international. This has kept the visibility of the swine program at a high level.

Goals for Next Five Years

Teaching:

To further enhance the 3 graduate courses I am teaching. To continue discussions with a colleague about developing a feed formulation class for advanced undergraduate students or beginning graduate students.

Research:

To continue to foster collaborative relationships with faculty members in universities in the US and internationally, to continue the evaluations of enzyme usage potential, to continue with research in novel nano-minerals, and to continue to develop graduate students.

Extension:

I have no formal responsibilities. My "extension" is primarily to the feed industry, an indirect avenue to the producer. Feed industry relationships will continue to be developed and strengthened.

FACULTY RESUME (2011-2017)

Name: James C. Matthews

Academic Rank: Professor

Year of First UK Appointment: 1998

Specialization: Nutritional Physiology

% DOE (6 yr avg): **Research:** 83

Extension:

Teaching: 17

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.S.	1988	Rutgers University
2.	M.S.	1991	Virginia Tech
3.	Ph.D.	1995	Virginia Tech

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. University of Kentucky-Alltech Professor of Applied Nutritional Sciences, 2011 - 2014
2. Adjunct Associate Professor, Dept. Animal & Poultry Sciences, University of Guelph, 2011
3. President-elect, Gamma Sigma Delta University of Kentucky Chapter, 2017
- 4.
- 5.

Awards

1. 2013 Thomas Poe Cooper Award for Agricultural Research, UK CAFE
2. 2016 George Mitchell Award for Outstanding Service to Graduate Students, UK GSD
- 3.
- 4.
- 5.

Committees

1. UK CAFE Tenure & Promotion Committee, 2013-2015
2. AFS Promotion and Tenure Committee, 2016-2017
3. Appointed Member, UK Senate Advisory Committee on Faculty Code, 2017
4. AFS Advisory Council, 2016-2017
5. ASAS Growth&Development and Lower Gut Symposium Program Committees, 2014-2016

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 6

Total number of graduate advisees: 6

Number of graduate students graduated: M.S.: 2 Ph.D.: 1

Number of graduate committees (excluding your students): M.S.: 5 Ph.D.: 5

Courses Taught (provide course number and semester taught)

ASC 683 (fall 2011, 2013, 2015)

ASC 689 (fall 2012, 2014, 2016)

ASC 771 (fall 2012; spring & fall 2013, 2014, 2015, 2016; spring 2017)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 20	Invited Presentations: 3
Abstracts: 18	Fact Sheets:
Book Contributions:	Posters: 8
Conference Proceedings: 2	Popular Magazines:
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress: 25	Other (e.g. websites): 2, GEO

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 460,000	As PI: \$ 733,200	As PI: \$ 25,000
As Co-PI: \$ 37,000	As Co-PI: \$	As Co-PI: \$
Subtotal: \$ 497,000	Subtotal: \$ 733,200	Subtotal: \$ 25,000

Total funding received: \$1,255,200

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

1. Acquired Industry/Hatch funding: (a) Determined (3, yr-long studies) that the ad libitum daily intake of vitamin-mineral mixes by beef cows grazing is 50 to 72 g/d (not 85 to 110), indicating that inclusion of Se (and other trace minerals) in vitamin-mineral mixes may be too low. (b) A 1:1 mix (MIX) of inorganic and organic Se forms (vs solely inorganic or organic Se forms) in vitamin-mineral mixes results in preferential testis (neonatal bulls) and hepatic (maturing heifers) transcriptome profiles.
2. Acquired ARS-SCA funding: (a) Determined the effects of consuming endophyte-infected tall fescue (E+) on hepatic and pituitary transcriptome profiles in grazing steers. (b) Tested the global hypothesis that negative effects of steers grazing E+ forage on serum prolactin and pituitary and hepatic transcriptome profiles would be ameliorated by consumption of only organic Se, MIX Se, vs only inorganic Se. In general, these hypotheses were accepted.
3. Acquired NIFA funding: determined that expression and function of high affinity glutamate transporters in livers of feedlot steers is decreased as steers develop from lean to fattened phenotypes and that this process is regulated by expression of specific regulatory proteins, concomitant with decreased glutamine synthetase activity but no change in glutathione content.

Goals for Next Five Years

Teaching:

Continue current program of graduate-level instruction: Protein Metabolism (ASC 683, 2 cr) fall of odd-numbered years, Physiology of Digestion and absorption (ASC 689, 3 cr) fall of even-numbered years, and AFS Graduate Seminar (ASC 771, 3 cr) every fall and spring.

Research:

1. Acquire continued funding for expiring NIFA-funded lean vs finished cattle phenotypes.
2. Acquire new NSF or NIFA funding for substrate vs energy regulation of nutrient transport.
3. Acquire continued funding for expiring ARS-SCA Se-form amelioration of fescue toxicosis.

Extension:

Not applicable per se except that (a) the form of Se (1:1 inorganic:organic) in the UK Beef Cattle free-choice vitamin-mineral mix is based on our research, and (b) we regularly present our research at producer/industry days and to Kentucky Beef Cattlemen's Association leaders.

FACULTY RESUME (2011-2017)

Name: Kyle R. McLeod

Academic Rank: Associate Professor

Year of First UK Appointment: 2001

Specialization: Ruminant Nutr & Physiol.

% DOE (6 yr avg): **Research:** 68

Extension:

Teaching: 12

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	Ph.D.	1994	University of Kentucky
2.	M.S.	1987	Texas Tech University
3.	B.S.	1985	Texas Tech University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Member of the Ruminant Nutrition Committee for the Joint Meeting of the American Society of Animal Production
2. Member of the Ruminant Nutrition Committee for the Joint Meeting of American Society of Animal Production
3. North American Committee member, EAAP International Symposium on Energy and Protein Metabolism
- 4.
- 5.

Awards

1. 2016 Thomas Poe Cooper Research Award
- 2.
- 3.
- 4.
- 5.

Committees

1. University of Kentucky Institutional Animal Care and Use Committee, Member, 2009-current
2. Graduate School Presidential Fellowship Awards Committee, Member, 2014-current.
3. Selection committee, University of Kentucky Attending Veterinarian position, 2016.
4. Chairperson of IACUC subcommittees for Training and Continuing Education & University
5. Chairperson of the Farm Safety and Animal Health Care committee, 2015-2016.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 0

Total number of graduate advisees: 5

Number of graduate students graduated: M.S.: 5 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 7 Ph.D.: 12

Courses Taught (provide course number and semester taught)

- ASC 681. Energy Metabolism. Spring 2011,2012,2015,2017
- ASC 771. Graduate Seminar. Fall 2013,2014,2015,2016,2017
- ASC 601. Mammalian Endocrinology. Fall 2010, Fall 2015
- ASC 684. Advanced Ruminant Nutrition. Fall 2017

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 24	Invited Presentations: 2
Abstracts: 28	Fact Sheets:
Book Contributions: 1	Posters:
Conference Proceedings: 2	Popular Magazines:
Numbered Extension Publications: 5	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$ 776,708	As PI: \$ 90,000
As Co-PI: \$	As Co-PI: \$ 492,610	As Co-PI: \$
Subtotal: \$	Subtotal: \$ 1,269,318	Subtotal: \$ 90,000

Total funding received: \$1,359,318

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Teaching: Taught graduate courses in energy metabolism and endocrinology and developed a new course (ASC 771) designed to equip incoming graduate students with necessary skills to effectively search the scientific literature, develop reference databases, and interpret and present scientific data. Started teaching Advanced Ruminant Nutrition as part of a team effort in 2017.

Research: Program seeks to advance the understanding of interactions between nutrient supply and conversion of substrates into energy and tissue stores in order to enhance animal productivity and improve prediction models for nutrient requirements. Over the 6-year period, efforts have been mainly divided into two areas: 1) impact of fescue-derived alkaloids on mammary function and energy metabolism and 2) microbial supplements (DFM) in growing and transition cattle. While we provide novel information as to the impact of fescue-derived alkaloids on whole-body energy metabolism in cattle, the most notable accomplishment was related to that concerning the identification of the cellular and molecular mechanisms by which fescue-derived alkaloids affect mammary development and function. This effort demonstrated that fescue-derived alkaloids decreased milk production, via a D2 receptor pathway, in a temporal manner without altering epithelial proliferation rate of the expression of mammary stem cell markers; resulting in no quantitative histological changes in mammary tissue. This has allowed for providing best management practices to ameliorate the effects of endophyte-infected tall fescue on milk and calf production in grazing animals. In addition, we sequenced the mammary gland transcriptome using next-generation technologies (RNAseq) at three discrete +

Goals for Next Five Years

Teaching:

Continue to provide a contemporary and challenging curriculum in the courses that I teach.

Research:

Maintain a funded and relevant research program.

Extension:

FACULTY RESUME (2011-2017)

Name: Melissa C. Newman

Academic Rank: Associate Professor

Year of First UK Appointment: 8/13/1998

Specialization: Food Microbiology

% DOE (6 yr avg): **Research:** 30

Extension: 35

Teaching: 22.5

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	Ph.D	1990	University of Kentucky
2.	M.S.	1987	University of Kentucky
3.	B.S.	1984	Thomas More College

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Director of the Food Systems Innovation Center (FSIC)
2. Director of Undergraduate Studies Food Science (Dept. Animal & Food Sciences)
- 3.
- 4.
- 5.

Awards

1. Gamma Sigma Delta - Master Teacher
- 2.
- 3.
- 4.
- 5.

Committees

1. UK Faculty Senate
2. UK Faculty Committee on Reward, Review and Retention
3. UK Graduate Faculty
4. Steering Committee Chair for the College of Agriculture's Food Systems Innovation Center
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees:

Total number of graduate advisees: 9

Number of graduate students graduated: M.S.: 4 Ph.D.: 3

Number of graduate committees (excluding your students): M.S.: 5 Ph.D.: 3

Courses Taught (provide course number and semester taught)

FSC 530 Food Microbiology - Fall 2011, 2012, 2013, 2014, 2015, 2016, 2017 (current)

FSC 540 Food Sanitation - Spring (even years) 2012, 2014, 2016

FSC 640 Foodborne Pathogen Spring (odd years) 2011, 2013, 2015, 2017

ASC 209 Veterinary Medical Terminology Spring (GEN 109 - 2015) 2015, 2016, 2017

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 8	Invited Presentations: 4
Abstracts: 11	Fact Sheets: 6
Book Contributions:	Posters: 9
Conference Proceedings: 1	Popular Magazines: 1
Numbered Extension Publications: 3	Patents/Genbank Register: 1
Reports of Progress: 2	Other (e.g. websites): 2

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$ 2,580,139	As PI: \$ 17,000
As Co-PI: \$ 10,500	As Co-PI: \$ 2,645,218	As Co-PI: \$ 42,690
Subtotal: \$ 10,500	Subtotal: \$ 5,225,357	Subtotal: \$ 59,690

Total funding received: \$ 5,295,547

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Teaching - I provide the most current and up-to-date material to the students so that when they leave my class they will be prepared to contribute to the work place.

Extension -Multi-Jurisdictional Animal Coordination Exercises (MARCE) 2014 & 2017 were Homeland Security Exercise and Evaluation Program (HSEEP) functional exercises where players collaborate to exercise resource coordination during major natural disaster-affecting animals. These exercises focused on nationwide coordination to test state Emergency Operations Center's (EOCs) ability to request out-of-state, federal, and non-governmental organization (NGO) resources in response to disasters affecting animals.

Food Systems Innovation Center supports the growth of strong food businesses by facilitating the profitable production, processing and marketing of local, healthful foods by integrating research, education and extension programs. Research - Using the techniques validated in my laboratory small meat/food processors are able to control pathogen contamination using economical alternative to chemical/preservative treatments on produce and meat. Resulting in products that are microbiologically more acceptable to the USDA/FDA and ultimately the consumer.

+

Goals for Next Five Years

Teaching:

Expand on-line teaching opportunities for students. Develop a study abroad program to strengthen student understanding of the foods industry. Continue to revise and update current classes

Research:

Continue to identify enhanced agricultural production technologies, food processing and preservation innovations, food distribution capabilities and ultimately human health.

Extension:

Increase FSIC's role in the growth of Kentucky food businesses. Build upon previous national activities to better prepare communities to deal with animals in disasters.

FACULTY RESUME (2011-2017)

Name: Anthony Pescatore

Academic Rank: Extension Professor

Year of First UK Appointment: 1986

Specialization: Poultry

% DOE (6 yr avg): **Research:** 0

Extension: 87.5

Teaching: 6.67

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	PhD	1981	Texas A&M University
2.	MS	1977	Michigan State University
3.	MBA	1985	Wilmington College

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Federation of Animal Science Societies (FASS), President
2. World Poultry Science Association-USA Branch, Board of Directors,
3. Poultry Science Association Foundation, Board of Directors,
4. Kentucky Egg Marketing Board
5. Kentucky Poultry Federation, Board of Directors

Awards

1. Phibro Extension Award
2. M.D. Whiteker Award for Excellence in Extension Programming
3. Kentucky Association of Extension Professionals Outstanding Project
4. Outstanding Extension Coordinator Award
5. Three graduate students awarded Certificates of Excellence at Poultry Science and IPSF

Committees

1. Poultry Science Association Fellows Committee
2. National Chicken Council Animal Welfare Committee
3. Kentucky Ag Water Quality Livestock Technical Committee
4. Kentucky Farm Bureau Poultry Committee
5. Department of Animal and Food Science Merit Evaluation Committee

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 0

Total number of graduate advisees: 8

Number of graduate students graduated: M.S.: 3 Ph.D.: 2

Number of graduate committees (excluding your students): M.S.: 3 Ph.D.: 2

Courses Taught (provide course number and semester taught)

ASC 470 Spring 11, 12, 13, 14, 15, 16, 17

ASC 340 Spring 16, 17

ASC 767, ASC 782 and ASC 792 Fall and Spring 11, 12, 13, 14, 15, 16, 17

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 14	Invited Presentations: 15
Abstracts: 77	Fact Sheets: 5
Book Contributions: 5	Posters:
Conference Proceedings: 2	Popular Magazines:
Numbered Extension Publications: 31	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$ 1028835	As PI: \$
As Co-PI: \$	As Co-PI: \$ 207000	As Co-PI: \$
Subtotal: \$	Subtotal: \$ 1235835	Subtotal: \$

Total funding received: \$ 1235835

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Through the UK/Alltech Alliance over \$800,000 of support has come into the Department of Animal and Food Sciences for poultry research facilities and operations. Over 200 experiments have been conducted at the facilities as part of the Alliance resulting in 6 graduate degrees and numerous publications. All graduate students found employment within their field. The Poultry extension program provided out reach to the commercial poultry industry and the emerging small flock clientele. My involvement through the Poultry Health Advisory Committee and the Kentucky component of the National Poultry Improvement Program help the state to prepare for an avian disease outbreak and the system was tested twice with out a failure. As the poultry industry continues to expand the location of poultry houses becomes critical, I serve as a sounding board for industry, producers and government officials on implementation of the Kentucky Ag Water Plan siting guidelines. Throughout the period covered I have been responsible for the Spring semester ASC 470 Capstone course in which I tried to expand the Animal Science students comprehension of Global Issues facing Animal Agriculture. I have assumed responsibility for the poultry production course and have begun to modernize the course.

Goals for Next Five Years

Teaching:

Continue to improve ASC 340 Poultry Management course to make it the best production course in the department.

Research:

To conduct research that solves the major issues facing the poultry industry to allow it to be profitable and sustainable. To complete the degree program of the three PhD candidates currently under by direction.

Extension:

To continue to disseminate research based information to all clientele from the large commercial industry to the urban chicken keeper. Provide information that helps them provide a safe poultry and meat supply at all levels of production and marketing.

FACULTY RESUME (2011-2017)

Name: Gregg Rentfrow

Academic Rank: Associate Extension Professor

Year of First UK Appointment: 2006

Specialization: Meat Science

% DOE (6 yr avg): **Research:** 0%

Extension: 77.2%

Teaching: 22.9%

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	Ph.D.	2005	University of Missouri
2.	M.S.	2000	University of Illinois
3.	B.S.	1997	University of Illinois

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Executive Board, Intercollegiate Meats Judging Coaches Assoc., AMSA, 2017 (elected)
2. Hearing Board, University of Kentucky, 2017 (appointed)
3. Board of Directors, Intercollegiate Meats Judging Coaches Assoc., AMSA, 2011-2013 (elected)
- 4.
- 5.

Awards

1. M.D. Whiteker Award for Excellence in Extension, KASEP, 2017
2. Achievement Award, AMSA, 2011
3. Outstanding Extension Award, Young Animal/Dairy Leader, ASAS, 2014
4. Outstanding New Extension Faculty Award, KASEP, 2009
5. Associate Member of the Year Award, KPPA, 2016

Committees

1. National Convention Planning Committee, 2017 American Association of Meat Processors
2. Food Science Advisory Comm., Locus Trace Agriscience School, 2016-present
3. Host for Southeastern Intercollegiate Meats Judging Contest, AMSA, 2007-present
4. Kentucky FFA Food Science CDE, host, 2014-present
5. Kentucky FFA Dairy Foods CDE, host, 2014-present

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 8

Total number of graduate advisees: 4

Number of graduate students graduated: M.S.: 3 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 5 Ph.D.: 5

Courses Taught (provide course number and semester taught)

ASC 300 Meat Science, Fall Semester, average 38 students/semester (instructor of record)

ASC 630 Advanced Meat Science, even numbered years, Spring semester (co-instructor of record)

ASC 102 Applications of Animal Science, Introduction of Meat Science, Spring Semester (guest lecture)

FSC 304 Animal Derived Foods, Fall 2012 & 2017, Country Hams, (guest lecture)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 9	Invited Presentations: 34
Abstracts: 13	Fact Sheets: 1
Book Contributions: 1	Posters: 1
Conference Proceedings: 1	Popular Magazines: 0
Numbered Extension Publications: 4	Patents/Genbank Register: 0
Reports of Progress: 0	Other (e.g. websites): 5 videos

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 5,000	As PI: \$	As PI: \$ 4,000
As Co-PI: \$	As Co-PI: \$ 2,224,550	As Co-PI: \$ 36,000
Subtotal: \$ 5,000	Subtotal: \$ 2,224,550	Subtotal: \$ 41,000

Total funding received: \$ 2,270,550

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Teaching - ASC 300 averages 38 students per fall semester. The overall value (3.8) and overall teaching (3.9) TCE evaluations continue to be above department, college, and university averages.

Extension - Meat Science extension activities, programs, and presentations continue to grow. We have developed a valuable relationship with Kentucky Fish and Wildlife by assisting them with their Beginning Deer Hunter's Workshop, as well as filming a deer carcass fabrication video that will be released this fall (2017). The UK Meat Cutting School continues to perform meat cutting demonstrations throughout the state. Furthermore, a meat processing workshop was organized and taught with the University of Maine and meat processors throughout Maine. Finally, in the spring of 2016 a Pork Processing Workshop was taught to 20 individuals from 4 states and received high evaluation scores. The Food Systems Innovation Center continues to be a vital program for the Commonwealth's small and medium sized food entrepreneurs. Recently, the FSIC has aided Fazoli's Italian Restaurant evaluate new menu items and is currently aiding new product development for Ale 8-1. The 4-H Country Ham program hit another milestone in 2016, eclipsing 800 students from 68 counties.

Research - I do not have an official research appointment, but I continue to work with the

Goals for Next Five Years

Teaching:

ASC 300 has been capped at 40 students and due to safety concerns, I will continue to maintain that total. I will continue to teach and maintain updated and current material for our students to learn from while in meat science.

Research:

I plan to continue to aid the department's research faculty. However, I have become interested in how UK students view and value local products and the importance of those products being offered on campus. I plan to research this area over the next 5 years

Extension:

Several states offer popular BBQ workshops. I would like to develop our own BBQ workshop to offer, that will involve local meat processors and culinary experts. Furthermore I plan to offer more meat cutting workshops, as interest continues to grow in that area.

FACULTY RESUME (2011-2017)

Name: Mary G. Rossano

Academic Rank: Associate Professor

Year of First UK Appointment: 2007

Specialization: Epidemiology & parasitology

% DOE (6 yr avg): **Research:** 8

Extension: 0

Teaching: 92

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.S.	1994	Michigan State University
2.	M.S.	1999	Michigan State University
3.	Ph.D.	2003	Michigan State University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Editorial Board of Veterinary Parasitology (2006-2016)
2. Ad hoc reviewer, Journal of Equine Veterinary Science
3. Ad hoc reviewer, Journal of the American Veterinary Medical Society
- 4.
- 5.

Awards

1. A Teacher Who Made a Difference Award, 2014 (nominated independently by 2 students)
2. Nominated for the Ken Freedman Advising Award (2015, 2016, 2017)
- 3.
- 4.
- 5.

Committees

1. Department of Animal and Food Sciences Assessment Committee
2. Equine Science and Management Assessment Committee
3. Equine Science and Management Curriculum Committee
4. Search committees for two positions, chair of one of them
5. Department of Animal and Food Sciences Social Committee

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 318

Total number of graduate advisees: 2

Number of graduate students graduated: M.S.: Ph.D.: 1

Number of graduate committees (excluding your students): M.S.: 2 Ph.D.: 3

Courses Taught (provide course number and semester taught)

2011 & 2012: EQM 105, spring; ASC 320, spring, summer 2 and fall; ASC 101 fall
2013 & 2014: EQM 105, spring; ASC 320, spring, summer 2 and fall; ASC 101 fall; GEN 300
2015: EQM 105, spring; ASC 320, summer 2 and fall; ASC 101 fall; ASC 333
2016: EQM 105, spring; ASC 320, fall; ASC 101 fall; ASC 333
2017: EQM 105, spring; ASC 320 fall (twice)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 6	Invited Presentations:
Abstracts: 15	Fact Sheets:
Book Contributions: 1	Posters:
Conference Proceedings:	Popular Magazines: 1
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 29,036	As PI: \$	As PI: \$
As Co-PI: \$ 200,000	As Co-PI: \$ 300,000	As Co-PI: \$ 115,000
Subtotal: \$ 229,036	Subtotal: \$ 300,000	Subtotal: \$ 115,000

Total funding received: \$ 640,036

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

I have contributed thousands of student contact hours to our department's instructional effort. Most of my classes have had laboratory sections attached to them in which I provided students with hands-on experiences such as handling horses, feeds identification and evaluation, skeletal anatomy, and dissections of digestive tracts, reproductive tracts and whole chickens. I have received the "Teacher Who Made a Difference" award and nominated for the Ken Freeman Advising Award three times. My classes generally receive evaluations that are at or above the college average. I participated in the development of an interactive educational computer game that was funded by a USDA Higher Education Challenge Grant. (The project started in 2010 and continued through 2014.) and have contributed to academic assessment research for the department. Those projects have resulted in peer-reviewed papers and published abstracts.

My research effort has always been small, but I have trained one PhD student and am in the process of training a Master's student. Most of my research is in the area of equine parasitology, but I was a major participant in the Kentucky Equine Survey, a large undertaking that required approximately \$615,00 in funding. My parasitology research is has produced papers testing control methods for equine parasites and a serological test for the equine nematode, *Parascaris equorum*.

Goals for Next Five Years

Teaching:

To continue to contribute a large portion of my distribution of effort to instruction and advising. I plan to learn more about ways to utilize technology for teaching, but will also continue to provide hands-on learning opportunities for students in the classes I teach.

Research:

I will increase my research activity and complete my current Master's student in the next year. My research will be in two areas: academic assessment and parasitology. I will sustain a research effort of approximately 20%.

Extension:

N/A

FACULTY RESUME (2011-2017)

Name: Rachel R. Schendel

Academic Rank: Assistant Professor

Year of First UK Appointment: 2017 (June)

Specialization: Food Science (Carbohydrates)

% DOE (6 yr avg): **Research:** 75

Extension: 5

Teaching: 25

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	Doct.	2016	Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
2.	M.S.	2012	University of Minnesota-Twin Cities
3.	BS	2010	University of Minnesota-Twin Cities

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

- 1.
- 2.
- 3.
- 4.
- 5.

Awards

1. American Assn. of Cereal Chemists Int., Endowment Fund Fellowship recipient, 2013-2014
2. American Assn. of Cereal Chemists Int., Elvira A. Tarleton Fellowship recipient, 2012-2013
3. MN-Institute of Food Technologists graduate scholarship recipient, 2012
4. MN-Institute of Food Technologists graduate scholarship recipient, 2011
5. Institute Danone travel scholarship recipient, 2015

Committees

1. American Association of Cereal Chemists Int. "Bioactives" technical committee member
- 2.
- 3.
- 4.
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 5 (KIT)

Total number of graduate advisees: 8 (KIT)

Number of graduate students graduated: M.S.: 8 (KIT) Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 0 Ph.D.: 0

Courses Taught (provide course number and semester taught)

Summer 2015 (two out of five components) of a three-week laboratory course at KIT for master students: "Praktikum Spezielle Lebensmittelanalytik" - Practical Course in Specialized Food Analysis

Winter 2014, Summer 2014, Winter 2013, Summer 2013 (two-day laboratory course at KIT for diploma students): "Spurenanalytik mit Gaschromatographie-Massenspektroskopie" –Trace Analysis with Gas Chromatography-Mass Spectrometry

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 7	Invited Presentations: 1
Abstracts: 0	Fact Sheets: 0
Book Contributions: 1	Posters: 8
Conference Proceedings: 3	Popular Magazines: 0
Numbered Extension Publications: 0	Patents/Genbank Register: 0
Reports of Progress: 2	Other (e.g. websites): 1

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 0	As PI: \$ 0	As PI: \$ 0
As Co-PI: \$ 0	As Co-PI: \$ 0	As Co-PI: \$ 0
Subtotal: \$ 0	Subtotal: \$ 0	Subtotal: \$ 0

Total funding received: \$ 0

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

My research at the Karlsruhe Institute of Technology (KIT) focused on developing quantitative screening methods for structural features of arabinoxylans, the main hemicellulosic fiber in grasses and cereal grains. I also isolated and characterized previously unknown structural elements and investigated the metabolic fates of specific structural components following incubation with human gut microbiota. These studies expanded our foundational knowledge of the structure of the plant cell wall in grasses and cereal grains, laid the groundwork for future investigations into how specific structural elements affect digestibility and fermentation of these plant materials, and were shared in several peer-reviewed journal articles and presentations at scientific conferences. Since joining UKY in June 2017, I have focused on developing collaborative relationships with other researchers and organizing my laboratory set-up for a research program which explores the structure/function relationships between plant cell wall carbohydrates, their digestibility, prebiotic behavior, and interactions with gut microbiota and also develops novel sources of prebiotic food ingredients from commodities and food processing waste streams.

At KIT, I was honored to co-advise eight Diploma students during their research projects and thesis-writing. I was also able to organize, design, and teach an advanced two-day laboratory course module on GC-MS method development and validation in food matrices.

Goals for Next Five Years

Teaching:

I look forward to teaching FSC 306 (Introduction to Food Processing) and FSC 538 (Food Fermentation and Thermal Processing), which are required and elective courses, respectively, in the food science curriculum. I also plan to develop a new graduate course focused on carbohydrate chemistry in foods.

Research:

I will pursue and obtain funding to support my research from a variety of sources, including government agencies and industry. I will advise and lead several graduate students and promote their personal and career development.

Extension:

I will develop positive relationships with members of the local food industry and promote the University of Kentucky as a source of trustworthy, up-to-date information and training opportunities.

FACULTY RESUME (2011-2017)

Name: Surendranath P. Suman

Academic Rank: Professor

Year of First UK Appointment: 2006

Specialization: Meat Science

% DOE (6 yr avg): **Research:** 85

Extension: 0

Teaching: 15

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	PhD	2006	University of Connecticut, USA
2.	MVSc	2001	Indian Veterinary Research Institute, India
3.	BVSc	1999	Kerala Agricultural University, India

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Associate Editor, Meat and Muscle Biology (2016 – Present)
2. Section Editor, Journal of Animal Science (2013 – 2016)
3. Member-at-Large, Executive Committee, IFT Muscle Foods Division, (2011–2014)
4. Editorial Board, Animal Frontiers (2012 – 2016)
5. Editorial Board, Meat Science (2010 – 2016)

Awards

1. Bobby Pass Excellence in Grantsmanship Award, UK College of Agriculture (2016)
2. Special Visiting Researcher Fellowship, Government of Brazil (2014 – 2017)
3. Early Career Achievement Award, American Society of Animal Science (2013)
4. Achievement Award, American Meat Science Association (2012)
5. Outstanding Young Animal Scientist Award – Research, ASAS Southern Section (2012)

Committees

1. Scientific Committee, International Congress of Meat Science & Technology, Ireland (2017)
2. Scientific Committee, World Congress of Food Science & Technology, Ireland (2016)
3. Committee for revising AMSA Guidelines for Meat Color Evaluation (2012)
4. AMSA Reciprocal Meat Conference Program Planning Committee (2011 – Present)
5. IFT Food Chemistry Sub-panel, Annual Meetings (2013, 2014)

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 12

Total number of graduate advisees: 4

Number of graduate students graduated: M.S.: 1 Ph.D.: 2

Number of graduate committees (excluding your students): M.S.: 3 Ph.D.: 10

Courses Taught (provide course number and semester taught)

FSC 304, Animal Food Products; spring 2012, 2014, 2016

FSC 430, Sensory Evaluation of Foods; fall 2012, 2014, 2016, spring 2017

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 37	Invited Presentations: 33
Abstracts: 44	Fact Sheets: 0
Book Contributions: 7	Posters: 0
Conference Proceedings: 7	Popular Magazines: 6
Numbered Extension Publications: 0	Patents/Genbank Register: 0
Reports of Progress: 0	Other (e.g. websites): 0

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 28,000	As PI: \$ 671,110	As PI: \$ 124,000
As Co-PI: \$ 0	As Co-PI: \$ 1,056,002	As Co-PI: \$ 0
Subtotal: \$ 28,000	Subtotal: \$ 1,727,112	Subtotal: \$ 124,000

Total funding received: \$ 1,879,112

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

I have established a stellar program investigating fundamental mechanisms governing meat color, myoglobin chemistry, and novel strategies to improve meat color. My program has been competitively and continuously supported by 6 USDA AFRI grants totaling more than \$1.5 million. The cutting-edge research from my productive program has resulted in more than 100 scientific publications, including 37 peer-reviewed journal articles. For my outstanding accomplishments in research, I have received several professional recognitions, including UK College of Agriculture's Bobby Pass Excellence in Grantsmanship Award (2016), Special Visiting Researcher Fellowship from the Government of Brazil (2014–2017), American Society of Animal Science (ASAS) Early Career Achievement Award (2013), American Meat Science Association (AMSA) Achievement Award (2012), and ASAS Southern Section Outstanding Young Animal Scientist Award for Research (2012). Furthermore, as a broadly recognized expert in meat color, I have delivered 33 scientific presentations in the US, Canada, Brazil, Uruguay, Australia, South Africa, China, India, South Korea, Germany, and Norway. For my significant contributions to teaching and student development, I received the University of Kentucky's Teachers Who Made a Difference Award in 2016.

Goals for Next Five Years

Teaching:

Continue teaching FSC 304 and FSC 430 for the IFT-accredited Food Science program at UK, incorporating the latest developments in food science and technology. This strategy will prepare our students to face the global challenges in their careers in food industry.

Research:

Advance the internationally-recognized research program on fundamental and applied aspects of meat color, by collaborating with scientists within and outside the US to synergistically address the color quality problems in traditional and non-traditional meat animals.

Extension:

Not Applicable

FACULTY RESUME (2011-2017)

Name: Kristine Urschel

Academic Rank: Associate Professor

Year of First UK Appointment: 2008

Specialization: Equine Nutrition and physiology

% DOE (6 yr avg): **Research:** 60.3

Extension: 0

Teaching: 39.7

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	BSc	2002	University of Alberta
2.	PhD	2007	University of Alberta
3.			

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. CAFE Representative on UK Faculty Senate (begin 3 year term in August 2017)
2. CAFE Faculty Council member (April 2015 - April 2017)
3. Executive Committee for American Society of Nutrition, Experimental Animal Nutrition Re
- 4.
- 5.

Awards

1. American Society of Animal Science Early Career Achievement Award 2015
2. Southern Section, American Society of Animal Science Outstanding Young Animal Scientist
- 3.
- 4.
- 5.

Committees

1. Chair, Equine Science and Management Curriculum Committee (May 2017 - present)
2. Member, Equine Science and Management Steering Committee (2012 - 2015)
3. Member, Nutrition Committee for the Equine Science Society (2017 - present)
4. Member, Department of Animal and Food Sciences Awards Committee (2017 - present)
5. Member, Steering Committee for the Individualized Program in Sustainable Agriculture

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 76

Total number of graduate advisees: 9

Number of graduate students graduated: M.S.: 4 Ph.D.: 2

Number of graduate committees (excluding your students): M.S.: 3 Ph.D.: 7

Courses Taught (provide course number and semester taught)

ASC 325 (Animal Physiology): Fall 2011 - 2017; Spring 2017

ASC 395 (Special Problems in Animal and Food Sciences)- Fall 2011, 2014-2016, Spring 2012, 2014-2017

ASC 410 (Equine Science): Spring 2011 - 2015

ASC 782/690 (Macronutrient Metabolism in Domestic Animals): Spring 2012-2015, 2017

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 12	Invited Presentations: 18
Abstracts: 27	Fact Sheets:
Book Contributions: 1	Posters: 1
Conference Proceedings:	Popular Magazines:
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 178,073	As PI: \$ 762,622	As PI: \$ 105,938
As Co-PI: \$	As Co-PI: \$ 95,167	As Co-PI: \$
Subtotal: \$ 178,073	Subtotal: \$ 857,789	Subtotal: \$ 105,938

Total funding received: \$1,141,800

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

In the last 5 years, my research has focused on determining factors, including age, disease status, feeding and glucocorticoid administration on the regulation of muscle protein synthesis and degradation in horses. Specifically, we have studied aged horses (over 20 years old), those with pituitary pars intermedia dysfunction (PPID) and those with insulin resistance relating to prolonged dexamethasone administration. While old age appears to reduce the activation of muscle protein synthesis, PPID alone did not influence protein synthesis. Prolonged dexamethasone administration does seem to result in perturbations in protein metabolism, favoring a reduction in muscle protein synthesis and an increase in protein breakdown. We have also used stable isotope techniques to assess whole-body protein synthesis and dietary amino acid adequacy in yearling and mature horses. In healthy, mature and yearling horses consuming good quality forage and a concentrate designed to meet crude protein requirements, threonine does not appear to be a limiting amino acid. In mature horses consuming an almost entirely forage diet, a lower protein timothy hay was as effective as a higher protein alfalfa hay at supporting whole-body protein synthesis. I have also taught Animal Physiology (ASC 325) every Fall since 2009 and began teaching it in the Spring as well in 2017. Since 2011, this class has grown from ~60 students to well over 100 students, necessitating the addition of a Spring section of the course. I developed ASC 690 (Macronutrient Metabolism in Domestic Animals) +

Goals for Next Five Years

Teaching:

I will continue working to incorporate additional assignments into ASC 325 that will help students with critical thinking, teamwork and communication skills. I anticipate continuing to teach ASC 325 every semester and ASC 690 every other Spring,

Research:

I will continue to seek external funding for my research in the area of protein metabolism, with specific focus on the regulation of muscle protein synthesis and degradation and assessing dietary protein and amino acid adequacy. I hope to expand my research to include exercising horses.

Extension:

N/A

FACULTY RESUME (2011-2017)

Name: Eric Vanzant

Academic Rank: Associate Professor

Year of First UK Appointment: 1998

Specialization: Ruminant nutrition

% DOE (6 yr avg): **Research:** 58.7

Extension: 0

Teaching: 28.8

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.S.	1986	Ohio State University
2.	M.S.	1989	Kansas State University
3.	Ph. D.	1993	Kansas State University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Interim Director of Undergraduate Studies 2014-2016
- 2.
- 3.
- 4.
- 5.

Awards

- 1.
- 2.
- 3.
- 4.
- 5.

Committees

1. UK Research Conflict of Interest Committee 2011-present
2. CAFE Freshmen Retention Team - Chair 2014, Member 2015
3. AFS Undergraduate Curriculum Assessment Committee - Chair 2011-present
4. AFS Undergraduate Curriculum Committee 2011-present
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 60

Total number of graduate advisees: 7

Number of graduate students graduated: M.S.: 3 Ph.D.: 2

Number of graduate committees (excluding your students): M.S.: 7 Ph.D.: 5

Courses Taught (provide course number and semester taught)

ASC 470 FA 2011, 2012, 2013, 2014, 2015, 2016

ASC 378 FA 2011, 2012, 2013, 2014, 2015, 2016

ASC 684 SP 2012, 2014, 2017

ASC 782 (Computer Applications for Scientists) SP 2013, 2016

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 16	Invited Presentations: 1
Abstracts: 17	Fact Sheets:
Book Contributions: 1	Posters:
Conference Proceedings: 2	Popular Magazines:
Numbered Extension Publications:	Patents/Genbank Register:
Reports of Progress:	Other (e.g. websites):

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$	As PI: \$ 1,234,611	As PI: \$
As Co-PI: \$	As Co-PI: \$ 610,100	As Co-PI: \$ 90,000
Subtotal: \$	Subtotal: \$ 1,844,711	Subtotal: \$

Total funding received: \$ 1,934,711

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

A large proportion of my funding over this cycle (~\$1.3 million) was from the Department of Homeland Security for work evaluating the application of current technologies for monitoring animal health. Work on that project is now essentially complete, and funding from that source is coming to an end. Thus, we are transitioning to a focus on commercialization of technologies and algorithms from this research. We are currently exploring opportunities with a couple of potential commercial partners that, if successful, would shift our research focus in this area away from concept development and toward product evaluation and enhancement. Our USDA/ARS funded research has focused on exploration of opportunities to minimize economic implications of fescue toxicosis for cattle producers in the southeastern US. We have determined production responses to supplementation with different distiller's byproducts for cattle grazing fescue and, through productive collaborative efforts, have begun researching the immunological consequences of fescue toxicosis. Additionally, during this time frame, we initiated work in the area of animal temperament. In addition to developing and evaluating an objective and 'user-friendly' measure of cattle temperament, we were the first to propose (and to demonstrate) relationships between temperament and nutritional management of growing and finishing cattle.

Goals for Next Five Years

Teaching:

In ASC 470, I hope to increase emphasis on ethical decision making related to our discipline. This will be facilitated by instruction I received at a national Animal Bioethics Workshop this summer. I will also update & extend my graduate Computer Applications course.

Research:

We are hopeful that our novel contributions at the interface of endophyte and temperament effects coupled to nutritional management and immunological responses will be able to be leveraged into new funding through the USDA.

Extension:

FACULTY RESUME (2011-2017)

Name: Paul Priyesh Vijayakumar

Academic Rank: Assistant Professor

Year of First UK Appointment: 2015

Specialization: Food Science

% DOE (6 yr avg): **Research:** N/A

Extension: 75%

Teaching: 25%

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	B.Tech	2008	Vellore Institute of Technology, Vellore, Tamil Nadu, India
2.	M.S	2010	Oklahoma State University, Stillwater, Oklahoma
3.	PhD	2014	Oklahoma State University, Stillwater, Oklahoma

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Food Safety Modernization Act, Produce Safety Rule Lead Trainer, July 2017
2. Appointed KASEP Board Member, May 2017
3. Food Safety Modernization Act, Preventive Controls for Human Food Lead Trainer, 2016
4. Appointed Member, Kentucky County Program Review Team, April 2016
5. Appointed Chair, Local Food Systems Committee – ANR Strategic Initiative, October 2015

Awards

1. Outstanding New Extension Faculty - KASEP, May 2017
2. Commissioned a Kentucky Colonel by the Governor of Kentucky, November 2015
3. Inducted into Professional Membership to Phi Tau Sigma, August 2015
4. Reviewer Recognition LWT Food Science and Food Research International, August 2015
5. Research Excellence Award - Oklahoma State University, April 2015

Committees

1. Graduate Student Committee – Animal and Food Sciences, May 2016
2. Graduate Student Committee – Nutrition and Dietetics, May 2016
3. Graduate Student Committee – Biosystems and Agricultural Engineering, August 2016
4. Member, FCS Food Systems Specialist Search Committee, October 2015 – July 2016
- 5.

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 2

Total number of graduate advisees: 4

Number of graduate students graduated: M.S.: Ph.D.:

Number of graduate committees (excluding your students): M.S.: 3 Ph.D.:

Courses Taught (provide course number and semester taught)

Introduction to Food Science (FSC107) Fall

Advance Food Technology (FSC536) Spring

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 1	Invited Presentations: 7
Abstracts: 2	Fact Sheets: 7
Book Contributions: 1	Posters:
Conference Proceedings: 1	Popular Magazines:
Numbered Extension Publications: 4	Patents/Genbank Register:
Reports of Progress: 1	Other (e.g. websites): 9

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 8,480	As PI: \$ 78, 166	As PI: \$
As Co-PI: \$	As Co-PI: \$ 48,000	As Co-PI: \$
Subtotal: \$	Subtotal: \$ 126, 166	Subtotal: \$

Total funding received: \$ 134, 646

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

EXTENSION

Conducted 15 workshops/training programs to 200 diverse clientele in Kentucky, which enabled them to obtain certifications and skills necessary to run their business. Updated Kentucky's GAP program to create a professional Produce Best Practices Training for Extension agents and trained 160 agents who will in turn train hundreds of growers in Kentucky. Provided process authority services on 216 products for 69 different clients, of which, 32 are from Kentucky and 37 are from four other states.

TEACHING

Obtained overall instructor and course ratings for FSC 107 in spring 2016 and fall 2016 that exceeded department, college, and university average ratings.

Goals for Next Five Years

Teaching:

Incorporate more interactive and application oriented teaching methods and include curriculum from professional certifications required in the food industry into course material that will enable students to obtain certifications as they complete the course.

Research:

Pursue federal grants opportunities to conduct application oriented research focused on food safety and value added products processing that will compliment Extension programs.

Extension:

Expand current educational programs to cover the entire state of Kentucky. Create easily accessible mobile applications on food safety and local foods that will instantly provide answers to questions from diverse clientele.

FACULTY RESUME (2011-2017)

Name: Jackie Wahrmund

Academic Rank: Lecturer

Year of First UK Appointment: 2016

Specialization: Equine

% DOE (6 yr avg): **Research:** 0

Extension: 0

Teaching: 100

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	BS	2005	University of Kentucky
2.	MS	2007	University of Florida
3.	PhD	2011	Oklahoma State University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Academic Director for the Northeast Texas Beef Improvement Organization (2013-2015)
2. Graduate Student Representative to the Southern Section of ASAS (2011-2012)
- 3.
- 4.
- 5.

Awards

1. Outstanding Faculty Member in the School of Agriculture, Texas A&M-Commerce (2015)
- 2.
- 3.
- 4.
- 5.

Committees

1. Social Committee, Dept. of Animal and Food Sciences, UK (2016-Present)
2. IACUC Committee, Texas A&M University-Commerce (2013-2015)
3. Curriculum Committee, School of Agriculture, TAMU-Commerce (2014-2015)
4. Director for the School of Agriculture Search Committee, TAMU-Commerce (2015)
5. Farm Master Plan Committee, chair; School of Agriculture, TAMU-Commerce (2014)

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 31

Total number of graduate advisees: 0

Number of graduate students graduated: M.S.: 0 Ph.D.: 0

Number of graduate committees (excluding your students): M.S.: 0 Ph.D.: 0

Courses Taught (provide course number and semester taught)

ASC 101 (Fall 2016, Spring 2017, Fall 2017)

ASC 205 (Fall 2016, Spring 2017, Fall 2017)

ASC 333 (Fall 2016, Spring 2017, Fall 2017)

ASC 382 (Spring 2017)

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 6	Invited Presentations: 0
Abstracts: 15	Fact Sheets: 0
Book Contributions: 0	Posters: 0
Conference Proceedings: 0	Popular Magazines: 0
Numbered Extension Publications: 0	Patents/Genbank Register: 0
Reports of Progress: 1	Other (e.g. websites): 0

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 25,525	As PI: \$ 10,997	As PI: \$ 12,015
As Co-PI: \$	As Co-PI: \$ 199,591	As Co-PI: \$
Subtotal: \$ 25,525	Subtotal: \$ 210,588	Subtotal: \$ 12,015

Total funding received: \$ 248,128

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

TEACHING: At UK, taught four different courses with enrollment totaling 439 students during Fall 2016 and Spring 2017. At A&M-Commerce taught 15 different courses with enrollment totaling 599 students from Fall 2012 through Spring 2015. Presented four teaching abstracts at Southern Section (2) and National ASAS meetings (2) between 2013 and 2015.

RESEARCH: At A&M-Commerce, conducted research in the areas of hydration strategies in horses, methods of assessing horse bodyweight, management of pasture-raised layers, and economics of precondition beef calves. Experiments were funded through USDA, private industry, and institutional support, totaling \$248,128. Results were presented in 6 abstracts at Southern Section ASAS (4) and SAEA (2) meetings.

Goals for Next Five Years

Teaching:

Improve student learning in the ASC 101 course through modification of current course content, updates to the student workbook, and investment of teaching funds into hands-on lab supplies. Develop the ASC 380 class to improve student knowledge of nutrition and feeds.

Research:

Conduct classroom research to improve teaching strategies, and present findings at national meetings, such as NACTA. Embrace any opportunity presented by research colleagues to collaborate in their research efforts.

Extension:

Embrace any opportunity presented by extension colleagues to assist with their extension and outreach efforts.

FACULTY RESUME (2011-2017)

Name: Youling Xiong

Academic Rank: Professor

Year of First UK Appointment: 1990

Specialization: Food Science

% DOE (6 yr avg): **Research:** 80

Extension: 0

Teaching: 20

Academic Background

	<u>Degree</u>	<u>Year</u>	<u>Institution</u>
1.	PhD	1989	Washington State University
2.	MS	1985	Oregon State University
3.	BS	1982	Jiangnan University

Committees, Awards, Offices for 2011-2017 (list those you consider most prestigious first)

Elected/Appointed Offices

1. Scientific Editor, Journal of Food Science (SCI indexed), 2012-17
2. Associate Editor, Food Bioscience (SCI indexed), 2012-2017
3. Alternate Councilor of Phi Tau Sigma, the national honor society of food science, 2011-14
4. Research Coordinator, UK Department of Animal and Food Sciences, 2011-2017
5. Accreditation and Assessment Coordinator, UK Food Science Program, 2015-18

Awards

1. Elected Fellow, International Academy of Food Science and Technology (IAFoST), 2016
2. Bertebos Prize, Royal Swedish Academy of Agriculture and Forestry, 2015
3. George E. Mitchell Outstanding Faculty Service to Graduate Students Award, GSD, 2013
4. Elected Fellow, American Chemical Society, Agric. & Food Chem. Div., 2012
5. Teacher Who Made a Difference Award, University of Kentucky, 2011

Committees

1. University of Kentucky P&T Committee (Biological Sciences), 2012-14; Chair, 2013-14
2. Juror, Fellow Selection Committee, Institute of Food Technologists (IFT), 2011-13
3. Graduate Affairs Committee (Admissions, Awards, etc.), UK AFS, 2011-17
4. Distinguished Research Award Committee, Am. Meat Sci. Assn., 2012-15
5. Annual Meeting Program Committee, Institute of Food Technologists (IFT), 2011-13

Teaching – Advising (totals for 2011-2017)

Total number of undergraduate advisees: 10

Total number of graduate advisees: 26

Number of graduate students graduated: M.S.: 3 Ph.D.: 15

Number of graduate committees (excluding your students): M.S.: 0 Ph.D.: 5

Courses Taught (provide course number and semester taught)

Food Chemistry (FSC 434G), Spring 2011, 13, 15, 17

Food Proteins (FSC 638), Fall 2012, 14, 16

Advanced Meat Science (FSC 630), Spring 2012, 14

Teaching, Research or Extension Publications (*numbers only for 2011-2017*)

AES Refereed Journal Articles: 76	Invited Presentations: 61
Abstracts: 30	Fact Sheets: 0
Book Contributions: 4	Posters: 18
Conference Proceedings: 6	Popular Magazines: 0
Numbered Extension Publications: 0	Patents/Genbank Register: 0
Reports of Progress: 6	Other (e.g. websites): 0

Funding Support (2011-2017)

<u>Internal – Competitive</u>	<u>External – Competitive</u>	<u>External – Gift</u>
As PI: \$ 40,000	As PI: \$ 2,259,176	As PI: \$ 477,380
As Co-PI: \$ 0	As Co-PI: \$ 2,259,176	As Co-PI: \$ 0
Subtotal: \$ 40,000	Subtotal: \$ 2,259,176	Subtotal: \$ 477,380

Total funding received: \$2,776,556

Brief Summary of Teaching, Extension or Research Accomplishments Since 2011:

Teaching: Since 2011, I have held an average DOE of approximately 80% research and 20% teaching. I have taught one course per semester, including both undergraduate and graduate levels courses. My teaching evaluation has been constantly high, and I believe my teaching was effective. I have also advised about 10 undergraduate students over this period.

Extension: None

Research: I have maintained a very productive research program that was well funded by both federal and industry sources. I have advised 7 international visiting scholars and completed 18 graduate students (15 Ph.D., 3 M.S.). A total of 76 research articles were published in peer reviewed journals. I also served as an Editor for two scientific journals (Journal of Food Science; Food Bioscience).

Goals for Next Five Years

Teaching:

Be a caring and dedicated teacher; continue teaching Food Chemistry, Food Proteins, and Advanced Meat Science.

Research:

Continue research productivity and high quality graduate student mentoring; be an active mentor for young faculty and graduate students; secure major extramural funding.

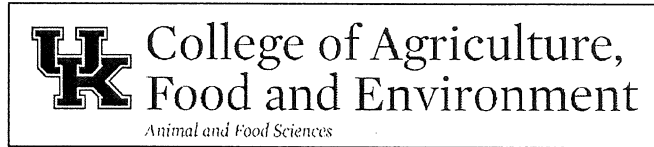
Extension:

Not expected.

Appendix D

Department of Animal
and Food Sciences
Rules of Procedure

APPENDIX D



DEPARTMENT OF ANIMAL AND FOOD SCIENCES

RULES OF PROCEDURE

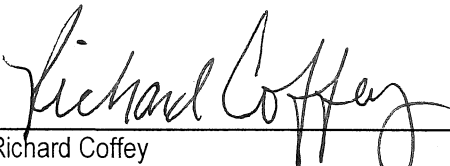
These Rules of Procedure are intended to be consistent with the Governing Regulations and the Administrative Regulations of the University of Kentucky, the Rules of the University Senate, the Rules of Procedure of the College of Agriculture, Food and Environment, and the laws of the Commonwealth of Kentucky and of the United States of America.

In the event that these Rules of Procedure are inconsistent or contrary to the above-mentioned regulations and laws, then those regulations and laws prevail.

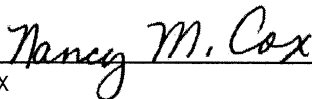
Submitted to the Department of Animal and Food Sciences faculty: September 19, 2016

Department of Animal and Food Sciences faculty approval: September 28, 2016

Signed and dated:


Richard Coffey
Chair, Department of Animal and Food Sciences

09/29/2016
Date


Nancy Cox
Dean, College of Agriculture, Food and Environment

10/3/2016
Date

NOTE: Provost signature no longer required on departmental rules of procedure

Tim Tracy
Provost, University of Kentucky

Date

I. ORGANIZATIONAL STRUCTURE

A. The Department Faculty

The faculty consist of all members of the department having the rank of Lecturer, Senior Lecturer, and Assistant Professor, Associate Professor or Professor in all title series except Adjunct, Emeritus and Part-Time Instructor, who are encouraged to participate in all phases of departmental activities but do not have voting privileges pertaining to departmental business. The jurisdiction and responsibilities of the faculty are defined by the Governing Regulations of the University of Kentucky. Input is accepted from all members of the department whether transmitted through committees or by individuals to the Department Chair.

B. The Department Chair

The responsibilities of the Department Chair are defined by the Governing Regulations of the University of Kentucky. The Department Chair provides leadership to the faculty in the development of policies on matters such as academic requirements, undergraduate programs, graduate programs, research programs, extension programs and service functions. The Department Chair presides over all departmental meetings or may delegate this function. The Department Chair appoints and is an *ex-officio* member of all departmental committees. The Department Chair is responsible for recommendations to the Dean of the College of Agriculture, Food and Environment on the appointment of new members of the faculty according to this *Rules of Procedure of the Department of Animal and Food Sciences* for appointment of new faculty members. The Department Chair also makes recommendations to the Dean on initial appointments, promotions, reappointments, terminal appointments, decisions not to reappoint, post-retirement appointments and the granting of tenure. The Department Chair is responsible for administering the periodic performance evaluations of departmental members, with appropriate faculty consultation, by procedures and criteria established by the University, the College and the faculty of the department.

C. The Department Associate Chair

The Department Associate Chair is appointed by the Department Chair. The responsibilities of the Associate Chair are to provide assistance to the Department Chair in monitoring the department's budget and managing the Business Office staff, managing and maintaining the physical infrastructure, and mentoring of faculty.

D. Advisory Council

The Advisory Council consists of eight faculty members elected by the department's faculty. The composition of the Advisory Council will be two faculty members with predominant teaching appointments in Animal Sciences, two faculty members with predominant research appointments in Animal Sciences, two faculty members with predominant extension appointments in Animal Sciences, one faculty member with predominant research/teaching appointment in Food Science, and one faculty member with predominant extension appointment in Food Science. Members are elected to two-year staggered terms. The Advisory Council advises the Department Chair on departmental policies and procedures, resource allocation, annual performance review of faculty, and other issues affecting the department. The Department Chair will serve as the Advisory Committee Chair.

E. Directors of Undergraduate Studies

The Directors of Undergraduate Studies (DUSs in Animal Sciences, Equine Science and Management, Food Sciences, Pre-Veterinary Medicine) are appointed by the Department Chair and works closely with the Department Chair in directing the undergraduate education programs of the department. The DUSs coordinate with the department's Academic Coordinators to organize the details of course schedule preparation, catalog revisions, awarding of scholarships, etc. The DUSs also coordinate with the department's Academic Coordinators on undergraduate advising, student recruitment and placement. The

DUSs inform the Department Chair of teaching equipment needs and act as a liaison to extension and research faculty.

F. Director of Graduate Studies

The Director of Graduate Studies (DGS) is appointed by the Department Chair and chairs the Graduate Activities Committee, and in that role directs the recruitment of graduate students, promotes the graduate program, and supervises students' academic progress. The DGS also assists students in meeting qualifications and time deadlines. The DGS administers the department's graduate program in accordance with the rules of the Graduate School and serves in placement and evaluation of graduate students, and serves as a liaison between the department and the Graduate School on student and departmental matters.

G. Extension Programs Coordinator

The Extension Programs Coordinator is elected by the department's Extension faculty and serves as a facilitator within the extension faculty. The Coordinator reviews the department's programs and advises the Department Chair on areas of emphasis necessary to strengthen the department's outreach efforts. This person coordinates required extension reports and assessment data. The Coordinator also works with teaching and research faculty in a liaison role and may give recommendations on assignment of duties among extension faculty to the Department Chair.

H. Faculty Animal Service/Support Unit Coordinators

This group includes faculty with oversight responsibilities of the department's Animal Units (LRC Beef Unit, LRC Sheep Unit, LRC Swine Unit, Coldstream Farm Dairy Unit, Coldstream Poultry Unit, North Farm Horse Unit, UKREC Beef Unit), Feed Mill, Meats Lab/Butcher Shop, Animal Lab (basement of Garrigus Building), and general research in the Garrigus Building. The Faculty Animal Service/Support Unit Coordinators are elected as needed by the faculty involved with the given animal or service/support unit.

I. Youth Development Coordinator

The Youth Development Coordinator is appointed by the Department Chair and provides general oversight of the department's youth outreach efforts and advises the Department Chair on areas of emphasis necessary to strengthen the department's youth extension programming efforts. In coordination with the Extension Programs Coordinator, the Youth Development Coordinator helps with required extension reports and assessment data.

J. Academic Coordinators

Academic Coordinators are full-time staff that work closely with the Department Chair, the department's Directors of Undergraduate Studies (Animal Sciences, Equine Science and Management, Food Sciences, Pre-Veterinary Medicine), and the Center for Student Success in the College of Agriculture, Food and Environment on undergraduate student academic advising. The Academic Coordinators also provide assistance with Merit Days, undergraduate student recruitment, on-campus visits by potential students, development of promotional materials, and data collection and reporting.

II. COMMITTEE STRUCTURE

The following committees provide assistance to the Department Chair in carrying out the important departmental responsibilities. Unless specified otherwise, when a member's specified term of appointment on a committee expires they are eligible for reappointment. With the exception of elected positions, the Department Chair appoints all departmental committees. The Department Chair is an *ex-officio* member of all committees. Committee membership will be established by September 30 annually.

A. Promotion and Tenure Committee

This committee consists of four full professors appointed by the Department Chair to serve a three-year term with the terms staggered so that no more than two new members are appointed each year. Appointments to this committee shall be such that at least three commodity/discipline groups are represented and at least one member of the committee must hold an extension appointment.

Functions of the committee include: (1) to facilitate faculty input into departmental decisions on promotion and tenure; (2) to advise faculty concerning promotion and tenure requirements; (3) to assist faculty in making effective presentations of materials supporting promotion and tenure; (4) to assist the Department Chair in assuring compliance with regulations concerning promotion and tenure; (5) to assist in making effective presentations of materials for two-year and four-year pre-tenure evaluations; (6) to provide advisory recommendations concerning promotion and tenure to Department Chair and affected faculty on request; and (7) to provide advisory recommendations concerning rank and tenure to the Department Chair and to search committees evaluating prospective faculty.

The promotion and tenure committee also reviews curricula vitae (CVs) of persons applying for adjunct series and research series faculty membership and provides recommendations to the Department Chair regarding their appointment.

B. Animal Science and Food Science Curriculum Committees

The Animal Science Curriculum Committee consists of five faculty members appointed by the Department Chair to serve a three-year term with the terms staggered so that no more than two new faculty members are appointed in a year. In addition, the Department Chair, the Director of Graduate Studies, the Director of Undergraduate Studies for Animal Science and Academic Coordinator for Animal Science serve as *ex-officio* members. This committee reviews and evaluates the Animal Science teaching, advising and student extracurricular programs and advises the Department Chair on changes to enhance the undergraduate and graduate education program.

The Food Science Curriculum Committee consists of the Food Science faculty with teaching appointments. In addition, the Department Chair, the Director of Graduate Studies, the Director of Undergraduate Studies for Food Science and Academic Coordinator for Food Science serve as *ex-officio* members. This committee reviews and evaluates the Food Science teaching, advising and student extracurricular programs and advises the Department Chair on changes to enhance the undergraduate and graduate education program.

C. Laboratory Safety Committee

The primary responsibility of this committee is to ensure continual review of laboratory safety. The committee of at least five persons is appointed by the Department Chair for three-year terms staggered so that no more than three people are replaced in any one year.

D. Farm Safety/Animal Health Care Committee

The primary responsibility of this committee is to continually review farm safety, prioritize needed equipment for safety purposes and inform the Department Chair of these needs. This committee is made up of all Animal Unit Managers and at least one faculty member. The faculty member is appointed by the Department Chair for a three-year term.

E. Graduate Activities Committee

This committee consists of five faculty members including the DGS (who chairs the committee) and four faculty members representing the major disciplines of the department that are appointed by the Department Chair on a two-year staggered cycle. This committee advises the Department Chair in matters related to the graduate program, undertakes graduate assessment, and makes recommendations on the graduate

stipends, length of time of stipends, and distribution of graduate student stipends assigned to faculty. This committee also assists the Director of Graduate Studies in all graduate program functions.

F. Recognition and Awards Committee

This committee consists of five faculty members and identifies persons in the department who are strong candidates for awards and prepares and submits the nomination files. Members are appointed by the Department Chair for three-year terms staggered so that no more than two people are replaced in any one year.

G. Additional Committees

The Department Chair may appoint additional *ad hoc* committees as are necessary to support the function and activities of the department. The duties of these committees will be determined by the Department Chair.

III. DEPARTMENTAL FACULTY MEETINGS

Departmental faculty meetings will be held monthly during the Fall and Spring academic terms, but may be more frequent upon the call of the Department Chair or a majority of the faculty. A scheduled faculty meeting may be cancelled, at the discretion of the Department Chair, if there are no agenda items. The Department Chair, or their designee, will preside over departmental faculty meetings, unless the meeting is called by faculty other than the Department Chair, in which case the faculty calling the meeting will oversee the meeting. All departmental faculty are expected to attend faculty meetings. All faculty meetings will follow the University policy on open meetings.

Items for the agenda at faculty meetings may be submitted to the Department Chair in advance of the meeting by any faculty member or may be added to the agenda during the course of the meeting if time allows. An agenda for the meeting will be circulated as time allows, but in general will be circulated approximately one week prior to the meeting. A quorum for the meeting shall consist of one more than 50% of the voting members of the faculty. Absentee voting will be allowed on agenda items requiring a vote provided the vote is submitted before the meeting in writing to the Department Chair. Minutes of the meeting will be recorded by the Department Chair's Administrative Assistant or an individual appointed by the Department Chair. Minutes are circulated to all faculty members for comment, corrections and additions and approved at the next faculty meeting. Minutes are stored in the department's administrative office and are available upon request.

IV. APPOINTMENT, REAPPOINTMENT, PROMOTION, AND TENURE

Faculty appointments, reappointments, terminal appointments, decisions not to reappoint, post-retirement appointments, phased-retirement appointments, and the promotion and tenure process shall be handled in accordance with the provisions set forth in the Governing and Administrative Regulations of the University of Kentucky and in accordance with the Rules of Procedure of the College of Agriculture, Food and Environment. Specific guidelines concerning faculty administration (faculty retirement, preparing the promotion tenure dossier, general timelines for activities, etc.) can be found on the college's web site.

V. DISTRIBUTION OF EFFORT

During the Spring semester of each year, or at a time designated by the college (if not Spring), the Department Chair with input from individual faculty members will develop an overall distribution of faculty time for the upcoming fiscal year to be approved by the Dean of the College of Agriculture, Food and Environment. A

Distribution of Effort (DOE) Form shall be developed concurrently by the Department Chair and the faculty member regarding major activities during the succeeding year. Should there be disagreement between the Department Chair and the faculty member on the DOE, the Dean of the college will resolve the disagreement, with the Dean's decision being final. If there is significant change in the faculty member's DOE during the fiscal year, an appropriately revised DOE agreement is to be negotiated by the Department Chair and faculty member.

VI. PERFORMANCE EVALUATION

Performance evaluation of departmental faculty and staff shall be carried out in accordance with the policies and procedures of the College of Agriculture, Food and Environment and Governing and Administrative Regulations of the University Kentucky. Faculty performance will be evaluated according to expectations outlined in the department's most recently approved Statement on Evidences of Activity in Instruction, Research and Extension for Tenure-Track Faculty or those for Lecturers and Senior Lecturers.

The Department Chair will perform a two- and four-year review for all pre-tenure tenure-track faculty members. Prior to the official review, the Department Chair will solicit input and feedback from all tenured faculty members (Associate Professors and Professors) in the department. The two- and four-year reviews will follow the university and college policies and procedures.

Evaluation of all faculty for tenure and/or promotion by the Department Chair and other members of the departmental faculty will be according to the expectations outlined in the department's most recently approved Statement on Evidences of Activity in Instruction, Research and Extension for Tenure-Track Faculty or those for Lecturers and Senior Lecturers and will follow the Governing and Administrative Regulations of the University of Kentucky, the policies of the University Senate, and the rules of the College of Agriculture, Food and Environment.

Specific guidance on procedures for preparing the curriculum vitae, teaching portfolio and other performance review materials can be found on the college's web site.

VII. SEARCH AND APPOINTMENT OF NEW FACULTY

Position searches and appointment of new faculty for vacant or newly created positions are to be an open and transparent process and shall be carried out in accordance with the policies and procedures of the College of Agriculture, Food and Environment and the Governing and Administrative Regulations of the University Kentucky. Open positions will be posted on the University of Kentucky's Integrated Employment System (IES) and should be widely advertised for a minimum of 45 days. When hiring an international candidate, the university's advertising guidelines for international candidates must be followed. Guidelines and procedures for the search and appointment of new faculty can be found on the college's web site.

VIII. VISITING SCHOLAR AND POST-DOCTORAL SCHOLARS

Any faculty member in the department may host a visiting scholar (including post-doctorate, visiting scientists, etc.) for appropriate scholarly effort in the department. Faculty approval is not required for a faculty member to have a visiting scholar; however, approval of the Department Chair is required. The faculty member hosting any type of scholar must furnish the Department Chair with a letter containing at least the following information regarding the scholar: inclusive date of visit, opportunity for extension of appointment, and source of funds. The letter must be accompanied by the appropriate visa documents.

IX. GRADUATE DEGREE PROGRAMS

The Department of Animal and Food Sciences offers both Master's (M.S.) and Doctor of Philosophy (Ph.D.) degree programs. To be considered for admission to the graduate program in the Department of Animal and Food Sciences, students must meet all university and department admission requirements and complete all the application forms required by the Graduate School and the department. Admission and degree requirements, timing of important activities, and other important policies and guidelines for graduate students can be found in the department's Graduate Student Handbook.

Each graduate student shall have a Major Professor (to mentor the student and guide their graduate degree program) and a Graduate Student Committee. The composition of the Graduate Student Committee shall conform to the guidelines of the Graduate School.

X. MODIFYING THE RULES OF PROCEDURE

These Rules of Procedure may be changed, amended and/or modified by vote of an absolute majority of all voting eligible faculty members. Proposed revisions to the Rules of Procedure must be discussed as an agenda item at a regularly scheduled meeting of the faculty, after which voting may be in person or by email. Departmental revisions to the Rules of Procedure must follow all college and university Governing and Administrative Regulations. Changes to the departmental Rules of Procedure are not effective until approved by the Department Chair, Dean and Provost.

Appendix E

Statement on Evidences of Activity in Instruction, Research and Extension

APPENDIX E

**Statement on Evidences of Activity in Instruction, Research and Extension that are
Appropriate for Use in Evaluation of Faculty
Candidates for Promotion and Tenure**
**Approved by the Faculty of the College of Agriculture, Food and Environment
Department of Animal and Food Sciences
November 19, 2009**

General Information

University regulations establish criteria for promotion and tenure. These criteria are framed in terms of the expectation for excellence across all areas of assigned activity. The Department of Animal and Food Sciences expects these criteria to be applied rigorously to all faculty title series. However, Department of Animal and Food Sciences faculty vary with regard to disciplinary expertise as well as extension, research and instruction Distribution of Effort. Therefore, specific evidences of activity to be considered in applying these criteria may vary greatly, particularly among mission areas. This statement on evidences should not be considered as inconsistent with or contradictory to university-level or to college-level regulations, nor with the criteria expressed therein.

This statement of activities applies to evaluations at all ranks, although evidences of activity demonstrating potential, professional advancement and trajectory of program development are weighted heavily for Assistant Professors being evaluated for progress toward tenure. Whereas, evidences of career achievement, sustained scholarly record, and documented impact will be factored more heavily for evaluation of Associate and Full Professors.

Scholarly Productivity

Scholarly productivity is most often documented through written works. Original research articles, translational or extension publications, reviews, book chapters, books and publications about instruction and pedagogy may all be examples of scholarly productivity as appropriate to the field and assignment. Non-traditional scholarly products using web-based or other electronic formats will also be considered.

In all cases, those works that have been rigorously peer-reviewed and are creative or original will be given more weight. This applies to work derived from research, instruction or extension assignments.

In extension, most forms of information delivery, including educational meetings, workshops, field days, webinars, newsletters, agent training, even individual responses and contacts, are considered evidence of activity and should be reported and will be considered in evaluations.

For instruction, evidence of productivity includes delivery of formal courses and student contact hours, development of materials, as well as support of student engagement, experiential education, organized student activities, professional development and advising.

Quality, Innovation and Impact

Both the submitted narrative and the record should demonstrate that the overall program has direction, focus and originality, and where possible documented impact. Publication in highly selective, rigorously refereed outlets can be an important metric of quality of scholarly works. Citation index and journal metrics are becoming more frequently used as quality measures in some cases but may not apply to all situations.

Research faculty are expected to establish a coherent body of work, focused on one or a small number of significant topics, as opposed to an unrelated collection of articles or materials. In some cases, particularly for applied research, a broad, diverse portfolio of successful studies is justified on the basis of responsiveness to critical needs. The ability to attract and mentor productive graduate students and post-doctoral scholars may also be considered as evidence of quality and/or impact.

Quality extension programs are characterized by clear direction, relevance and an ability to respond to changing clientele needs. They should be science and research based; and they should employ creative, effective methods of education and communication. Extension programs are associated with high quality materials or works in relevant, appropriate, accessible outlets. Quantitative or at least systematic assessment may be useful in documenting the quality, innovation or impact of extension programming.

Student evaluations of teaching are considered to be a valid, if approximate, index of teaching quality particularly when considered in conjunction with other measures. In instruction, contributions to students beyond the formal classroom (e.g., advising, activities, and positive interaction) can be important evaluation factors. Success and achievement of students and advisees may be considered for teaching assignments. Professional development and teaching improvement activities are considered to document commitment to quality instruction. Peer evaluation of classroom teaching is often used as a formative, rather than a summative tool. A demonstrated record of sustaining scholarly productivity through funding or support for the program as appropriate to the field will be an important factor, particularly for research assignments.

Peer recognition (awards, invitations to serve on review panels, editorial boards, etc.) also is considered as evidence of quality. When available, documented benefits to stakeholders, e.g., changed practice, profit, or quality of life can be important measures for all faculty activities.

Collaborative Efforts, Recognition, Professional Service and Leadership

As leaders of a public land grant institution, faculty of the Department of Animal and Food Sciences are required to be highly accessible, responsive and interactive with peers, students and constituents. Faculty should be expected to engage in collaborative work as appropriate to the advancement of their and the Department's and College's programs. Collaborative efforts within the Animal and Food Sciences Department and the College of Agriculture, Food and Environment are encouraged. Descriptions of collaborative programs should include a list of all participants, and the success and impact of the program should be documented. Special effort

should be made to describe the role of the faculty member (conception, development and/or implementation) and their level of participation (leadership, major, moderate, minor).

Documentation of peer recognition may include significant awards, invitations to make presentations externally, service on national panels or committees, editorial appointments, leadership positions in professional societies, and other indicators. Nationally competitive grants may be significant evidence of peer recognition in many fields.

University, college or department level service may be offered as documentation of leadership in a major DOE area (research, teaching, extension) or it may be evaluated as a special assignment, as agreed upon by the chair and the faculty member.

Exceptional individual performance is typically associated with notable positive impact on the success of students, colleagues, and the department, through leadership and professional service.

Appendix F

Criteria and Evidences of Activity for Lecturers

APPENDIX F

College of Agriculture, Food and Environment
Criteria and Evidences for Appointment, Reappointment, Nonrenewal of Appointment,
Terminal Appointment, Promotion and Faculty Performance for Lecturers
and Senior Lecturers
Approved by the Tenured & Tenure-Eligible Faculty of
Department of Animal and Food Sciences on October 29, 2010
Approved by the Dean on November 5, 2010

Appointment

The criteria for appointment include an earned terminal degree appropriate to the field of assignment (with the approval of the provost, evidence of the appropriate professional experience or credentials may substitute for a terminal degree). Candidates must also have demonstrated good teaching experience. Other credentials, such as publications, may also be considered.

Appointments

Lecturer appointments in the College of Agriculture, Food and Environment may be for 9, 10, 11, or 12 months. Periods are determined at the time of the creation of the position description.

Reappointments follow AR 2:9 <http://www.uky.edu/Regs/files/ar/ar2-9.pdf>.

Nonrenewal of appointments and terminal appointments follow AR 2:9 <http://www.uky.edu/Regs/files/ar/ar2-9.pdf>.

Performance Review

The college policies on performance review of lecturer series faculty employees prescribe that lecturer series faculty employees undergo faculty performance review as follows:

1. At the rank of lecturer, performance reviews occur annually, according to established College of Agriculture, Food and Environment criteria posted at <http://administration.ca.uky.edu/facultyapr>.
2. At the rank of senior lecturer, performance reviews occur biennially, according to established College of Agriculture, Food and Environment criteria posted at <http://administration.ca.uky.edu/facultyapr>.

Promotion

In order to be considered for promotion to senior lecturer in the College of Agriculture, Food and Environment, a lecturer must have a terminal degree. A lecturer with a terminal degree may be considered for promotion (without tenure) from the rank of lecturer to the rank of senior lecturer at any time after five (5) years of continuous full-time service, contingent upon agreement of the departmental faculty with the chair, and in consultation with the dean. In preparing a recommendation to the dean on a promotion case in the lecturer series, the educational unit administrator shall consult with the appropriate faculty employees of the unit and obtain their written judgments. Prior to making a recommendation to the provost on a promotion case in the lecturer series, the dean shall provide the dossier (http://administration.ca.uky.edu/files/p_t_2013_senior_lecturer_promotion_process.pdf) to the college advisory committee on appointment, reappointment, promotion, and tenure, and obtain its written advice. The provost makes the final decision on the promotion, without reference to an area committee.

Teaching

The teaching portfolio is an important element in the promotion and performance review process.

Satisfactory performance of faculty in resident teaching focuses on the development of innovative course materials, lectures, assignments, alternative teaching methods, and on examinations that provide educational benefits to students. Courses should be content driven with learning outcomes clearly stated. Course content is expected to be up-to-date, applicable

to the subject matter, and at the appropriate level. Exams and assignments should reflect course materials and lectures, and be reviewed and returned within a reasonable period. Instructors are expected to be available to assist students outside of the classroom and to follow all University Rules that protect student rights.

Teaching evaluations by students should reflect this positive learning environment, but not be the primary factor in evaluating teaching. The entire teaching portfolio (which includes numerical course evaluations as a part) should be used as the primary tool to evaluate teaching. Suggested items to include in the teaching portfolio include one's teaching philosophy, samples of materials detailing course content and innovative instructional methods, teaching awards, numerical ratings, courses taught, new course development, teaching methods, student advising, student mentoring, teaching workshops and professional meetings, student organizations, student recruitment, other curriculum responsibilities, refereed journal articles related to teaching, non-refereed publications related to teaching, teaching grants, or other evidence of professional recognition.

Service

Satisfactory performance in service shall be measured by active engagement in assisting the department, college, university, profession, and clientele groups in achieving desired goals and objectives. Examples include administrative or coordinator service, serving on departmental, college or university committees, serving as an officer in or advisor to professional or college and university organizations, editorships, journal or project reviewer, service on clientele boards, and other outreach activities not associated with teaching, research, or extension.

For promotion to senior lecturer, an individual should provide evidence of professional development through continued engagement with the discipline or its pedagogy, including some or all of the following:

1. published or presented work in the field of study appropriate to the discipline;
2. active participation in conferences, workshops, professional organizations, and other public venues pertinent to the discipline proper or its pedagogy;
3. service to the department, college, university, profession or clientele.

Tenured and tenure-eligible faculty members in Department of Animal and Food Sciences have established by majority vote the maximum number of lecturer faculty that may be employed as four.

Appendix G

2016-17 Undergraduate
Degree Major Sheet for
Animal Sciences



Animal Sciences

College of Agriculture, Food and Environment

Animals have many important roles in human societies including the provision of food and fiber, draft power, recreational and athletic activities, and companionship. In addition, animals and their interactions with humans have environmental consequences. Processing, preservation, and quality of animal-derived foods significantly affect human health and economics. Animal Sciences involves studying and applying the basic principles of nutrition, reproduction, and genetics to the production and management of animals including horses, dairy and beef cattle, sheep, swine, poultry, and other domesticated species. Additional course work provides information on production and handling of animal-derived foods.

No one program fits all Animal Sciences students. Students come from varied backgrounds and their interests range from livestock and poultry production and management to marketing and public relations; from public education and extension to graduate training in research and teaching and veterinary medicine. No matter what species you have an interest in, the Animal Sciences major will allow you to combine your interest with your desire for an exciting and rewarding career.

As an Animal Sciences major, students have the opportunity to pursue specific interests by selecting one of three study options: Animal Industry, Food Industry or Pre-Professional. The Animal Industry option is for those students interested in animal production and management and allows specialization in one of three areas: livestock, equine, or dairy. The Food Industry option is designed to provide an emphasis on aspects of food processing, chemistry, and safety. The Pre-Professional option is a rigorous study program for students with interests in veterinary sciences, human medicine, and graduate research. Students must consult the pre-professional advisor or graduate school advisor of the university to which they intend on applying for additional or specific requirements.

Career Opportunities

To keep pace with the food, fiber, and recreation requirements of a growing world population, Animal Sciences graduates are needed in the livestock industry and closely related fields. The Animal Sciences major offers considerable flexibility in fulfilling specific career objectives, whether you are interested in working directly with livestock or indirectly in closely related areas such as agribusiness, research, government, or education.

Graduation Requirements

To earn the Bachelor of Science in Animal Sciences, the student must have a minimum of 120 credit hours with at least a 2.0 grade-point standing. A minimum of 45 credit hours must be from upper division courses (300 and above). Remedial courses may **not** be counted toward the total hours required for the degree. In addition to UK Core requirements, students must complete college, departmental and specialty support requirements.

UK Core Requirements

See the *UK Core* section of the *2016-2017 Undergraduate Bulletin* for the complete UK Core requirements. The courses listed below are (a) recommended by the college, or (b) required courses that also fulfill UK Core areas. Students should work closely with their advisor to complete the UK Core requirements.

I. Intellectual Inquiry in Arts and Creativity

Choose one course from approved list 3

II. Intellectual Inquiry in the Humanities

Choose one course from approved list 3

III. Intellectual Inquiry in the Social Sciences

Choose one course from approved list 3

IV. Intellectual Inquiry in the Natural, Physical, and Mathematical Sciences

CHE 105 General College Chemistry I 4
CHE 111 Laboratory to Accompany General Chemistry I 1

V. Composition and Communication I

CIS/WRD 110 Composition and Communication I 3

VI. Composition and Communication II

CIS/WRD 111 Composition and Communication II 3

VII. Quantitative Foundations

MA 123 Elementary Calculus and Its Applications
or
MA 113 Calculus I
or
MA 137 Calculus I With Life Science Applications 4

VIII. Statistical Inferential Reasoning

Recommended:
STA 210 Making Sense of Uncertainty:
An Introduction to Statistical Reasoning 3

IX. Community, Culture and Citizenship in the USA

GEN 100 Issues in Agriculture, Food and Environment 3

X. Global Dynamics

Choose one course from approved list 3
UK Core hours **33**

Graduation Composition and Communication Requirement (GCCR)

WRD 203 Business Writing
or
WRD 204 Technical Writing 3

Graduation Composition and Communication Requirement hours (GCCR)

..... 3

Premajor Requirements

MA 123 Elementary Calculus and Its Applications
or
MA 113 Calculus I
or
MA 137 Calculus I With Life Science Applications 4
BIO 148 Introductory Biology I 3
BIO 152 Principles of Biology II 3
CHE 105 General College Chemistry I 4
CHE 107 General College Chemistry II 3
CHE 111 Laboratory to Accompany General Chemistry I 1
CHE 113 Laboratory to Accompany General Chemistry II 2
Subtotal: Premajor hours **20**

–CONTINUED–

University of Kentucky is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award associate, baccalaureate, masters, and doctorate degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call 404-679-4500, or online at www.sacscoc.org for questions about the accreditation of University of Kentucky.

Animal Sciences • 2

Major Requirements

ASC 101 Domestic Animal Biology	3
ASC 102 Introduction to Livestock and Poultry Production	3
ASC 205 Career Development for Animal Sciences	1
ASC 325 Animal Physiology	3
ASC 362 Animal Breeding and Genetics	4
ASC 364 Reproductive Physiology of Farm Animals	4
ASC 378 Animal Nutrition and Feeding	4
ASC 470 Capstone for Animal Agriculture	3
ASC 499 Academic Enrichment Experience in Animal Sciences	1
plus at least three of the following courses:	
ASC 340 Poultry Production	2
ASC 404G Sheep Science	4
ASC 406 Beef Cattle Science	4
ASC 408G Swine Production	3
ASC 410G Equine Science	3
ASC 420G Dairy Cattle Management	3
Subtotal: Major hours	34-38

In addition to the Major Requirements, students choose **one** of three options:

Option A: Animal Industry

Students fulfilling the Major Requirements are eligible for the Animal Industry Option by taking certain required Specialty Support Courses (see below). In addition, students with more specific interests may, but are not required to, choose from three specializations available within this Option.

No Specialization

(required Specialty Support only; see below)

Livestock Specialization

ASC 300 Meat Science	4
and at least two from:	
ASC 340 Poultry Production	2
ASC 404G Sheep Science	4
ASC 406 Beef Cattle Science	4
ASC 408G Swine Production	3

Equine Specialization

ASC 310 Equine Anatomy	2
ASC 320 Equine Management	3
ASC 410G Equine Science	3

Dairy Specialization

ASC 420G Dairy Cattle Management	3
ASC 564 Milk Secretion	3

Subtotal: Option A hours **0-5**

Option B: Food Industry

Students fulfilling the Major Requirements are eligible for the Food Industry Option by taking certain required Specialty Support Courses (see below) and:

ASC 300 Meat Science	4
FSC 107 Introduction to Food Science	3
Subtotal: Option B hours	7

Option C: Pre-Professional

Students fulfilling the Major Requirements are eligible for the Pre-Professional Option by taking certain Specialty Support Courses (see below). Students must consult the pre-professional advisor or graduate school advisor of the university to which they intend on applying for additional or specific requirements.

Specialty Support

Animal Industry Option

CHE 230 Organic Chemistry I		
or		
CHE 236 Survey of Organic Chemistry	3	
Depending on the student's area of interest and subject to the advisor's approval, additional courses at the 200-level or above may be selected from biochemistry, biology, chemistry, physics, statistics, or any agriculture-related area other than Animal Sciences		15

Food Industry Option

CHE 230 Organic Chemistry I		
or		
CHE 236 Survey of Organic Chemistry	3	
FSC 304 Animal Food Products	4	
Depending on the student's area of interest and subject to the advisor's approval, additional courses at the 200-level or above may be selected from biochemistry, biology, chemistry, physics, statistics, or any agriculture-related area other than Animal Sciences		12

Pre-Professional Option*

BIO 304 Principles of Genetics	
or	
ABT/ENT 360 Genetics	3-4
CHE 230/231 Organic Chemistry and Laboratory I	4
CHE 232/233 Organic Chemistry and Laboratory II	4
PHY 211 General Physics	5
PHY 213 General Physics	5

**Students must consult the pre-professional advisor or graduate school advisor of the university to which they will apply for additional or specific requirements.*

Subtotal: Specialty Support **18-22**

Electives

Electives should be selected to complete the 120 hours required for graduation.

Subtotal: Electives **minimum of 18**

TOTAL HOURS: **120**

Appendix H

2016-17 Undergraduate Minor Sheet for Animal Sciences

The Academic Minor

Many departments have designed academic minors for the convenience of undergraduate students.

A minor is a structured group of courses that leads to considerable knowledge and understanding of a subject, although with less depth than a major. Some employers consider minors desirable, and the corresponding major requirements at the University may stipulate a minor. Some students choose to complement their major program with a minor in a related field or even in an entirely different field of interest. Students interested in pursuing an academic minor should contact their college dean's office and the department responsible for the minor program for guidance and advising.

Please note that undergraduate students can only complete a minor *in addition to* and as a *complement to* a major. The University does not award stand-alone minors.

Minor in Animal Sciences

Prerequisites

Note that several classes in both Group A and Group B have prerequisites beyond ASC 101. These are indicated in parenthesis following the courses below. Students taking the minor are responsible for satisfying the prerequisites.

Minor Requirements

Hours

ASC 101 Domestic Animal Biology	3
ASC 102 Introduction to Livestock and Poultry Production (<i>ASC 101</i>)	3
Additional Course Work	9
At least 9 credit hours must be selected from the list that follows (Groups A and B). At least one course must be selected from Group A and one course from Group B.	
Group A	
ASC 300 Meat Science (<i>ASC 101 and 102</i>)	4
ASC 325 Animal Physiology (<i>BIO 152</i>)	3
ASC 362 Animal Breeding and Genetics (<i>ASC 101 and BIO 152</i>)	4
ASC 364 Reproductive Physiology of Farm Animals (<i>ASC 101 and BIO 152</i>)	4
ASC 378 Animal Nutrition and Feeding (<i>ASC 101 and CHE 230 or 236</i>)	4
Group B	
ASC 340 Poultry Production (<i>ASC 101 or 102</i>)	2
ASC 404G Sheep Science (<i>ASC 300, 362, 364, 378</i>)	4
ASC 406 Beef Cattle Science (<i>ASC 300, 362, 364, 378</i>)	4
ASC 408G Swine Production (<i>ASC 101 and 102</i>)	3
ASC 410G Equine Science (<i>ASC 310, 364, 378</i>)	3
ASC 420G Dairy Cattle Management (<i>ASC 325, 364, 378</i>)	3
Total Hours Required	15

Appendix I

Animal Sciences Undergraduate Course Descriptions

APPENDIX I -Animal Sciences Course Descriptions

College of Agriculture, Food and Environment

ASC

Animal Sciences

ASC 101 DOMESTIC ANIMAL BIOLOGY. (3)

The first in a sequence of two courses providing an introduction to the subject of animal science. Emphasis is placed on a fundamental understanding of anatomy, physiology, nutrition, reproduction, genetic and behavior of domestic animals. [Offered in fall only.]

ASC 102 INTRODUCTION TO LIVESTOCK AND POULTRY PRODUCTION. (3)

The second in a sequence of two courses providing an introduction to the subject of animal science. Emphasis is placed on the application of scientific disciplines of anatomy, physiology, nutrition, reproduction, genetics and behavior in the management of domestic animals. Prereq: ASC 101. Primary registration access limited to College of Agriculture, Food and Environment majors and remaining seats open during secondary registration. [Offered in spring only.]

ASC 106 ANIMAL AGRICULTURE IN THE MODERN WORLD. (3)

Relationships of food production and consumption to income of humans throughout the world; major livestock (beef and dairy cattle, sheep, swine, poultry and horses) production areas of the world; relationships between live animal merit and yield of retail cuts of meat; identification of skeletal components; identification and functions of reproductive and digestive tract components; characteristics of breeds of beef and dairy cattle, sheep, swine, poultry and horses.

ASC 205 CAREER DEVELOPMENT FOR ANIMAL SCIENCES. (1)

Local experts in a wide variety of animal production enterprises and associated support services will give presentations on their area of expertise. Following the presentation, students will have the opportunity to discuss the topic of the day and potential employment opportunities in that field with the speaker. Prereq: ASC 102 (or concurrent enrollment). [Offered in fall and spring.]

ASC 209 VETERINARY MEDICAL TERMINOLOGY. (3)

This course will cover veterinary terminology including medical word roots, prefixes, suffixes and animal specific terminology involving food animals, horses and pets. Veterinary case studies will allow students to apply these fundamentals in practical situations. Appropriate for pre-vets and any students interested in animal health and care.

ASC 300 MEAT SCIENCE. (4)

A historical perspective of the meat industry together with major changes in body type and composition in both the live animal and its end product meat. Students will evaluate live market animals (swine, cattle, sheep), harvest the market animals, and follow their carcasses and cuts through fabrication and distribution channels. Major topics of discussion will focus on growth and development, inspection, grading, physical and chemical composition of meat and postmortem changes that affect meat quality. Additional information will cover meat marketing trends, nutrition, meat cookery, meat selection, health issues and consumer information. Prereq: ASC 101 and ASC 102. [Offered in fall only.]

ASC 301 LIVESTOCK SELECTION AND EVALUATION. (3)

Selection principles of purebred and commercial beef cattle, sheep, swine and horses. Evaluation of live animal and carcass characteristics of beef cattle, sheep and swine. Emphasis placed on oral reasons. Laboratory, six hours. Prereq: Junior or senior standing or consent of instructor. [Offered in fall only.]

ASC 303 EVALUATION AND GRADING OF MEATS. (2)

A detailed consideration of the factors involved in the selection, grading and evaluation of carcasses and wholesale cuts of beef, pork and lamb. Specific emphasis will be given to cutability, quality and maturity as they relate to palatability and acceptance by the consumer. Laboratory, four hours. Prereq: FSC 304 or FSC 306. [Offered in spring only.]

ASC 309 ADVANCED EVALUATION AND GRADING OF MEAT. (2)

Further consideration of the factors involved in selecting, grading and evaluating carcasses and wholesale cuts of beef, pork, and lamb. Emphasis will be placed on writing reasons. Laboratory, four hours. Prereq: ASC 303 or consent of instructor. [Offered in fall only.]

ASC 310 EQUINE ANATOMY. (2)

Anatomy of the horse's systems. Topics will include the anatomy of skeletal, muscular, respiratory, digestive, cardiovascular, and nervous systems. By the end of the course the students will be able to name and identify all the equine bones and their respective anatomical landmarks, know the equine muscles and tendons responsible for locomotion and their respective skeletal attachments, and describe the anatomy and recognize the function of the equine respiratory, cardiovascular, digestive, and nervous systems. Prereq: ASC 101. [Offered in fall and spring.]

ASC

Animal Sciences

- ASC 311 ADVANCED EQUINE EVALUATION. (1)**
Advanced study of conformation and performance in the horse. Selection of horses of different breeds based on confirmation, breed character and movement. Emphasis will be placed on developing a knowledge of industry standards and preparation of oral reasons. Prereq: ASC 310. [*Offered in fall only.*]
- ASC 312 ADVANCED LIVESTOCK SELECTION AND EVALUATION. (2)**
Selection of purebred and commercial beef cattle, sheep, swine and horses. Special emphasis on oral reasons, livestock contest procedures and herd improvement principles. Laboratory, six hours. Prereq: ASC 301 or consent of instructor. [*Offered in spring only.*]
- ASC 320 EQUINE MANAGEMENT. (3)**
Study of the basic principles associated with horse management. Topics will include equine behavior, equine diseases and herd health programs, facilities and environmental management, nutrition and feed management. Lecture, two hours; laboratory, three hours per week. Prereq: ASC 101. [*Offered in fall, spring (online), summer (online).*]
- ASC 321 DAIRY CATTLE EVALUATION. (2)**
Evaluation of dairy cattle for type characteristics. Laboratory, four hours. [*Offered in spring only.*]
- ASC 323 ADVANCED DAIRY CATTLE EVALUATION. (1)**
Open only to those who have consent of instructor. Laboratory, two hours. Prereq: ASC 321. [*Offered in fall only.*]
- ASC 325 ANIMAL PHYSIOLOGY. (3)**
An introduction to the functional anatomy and physiology of major body systems in domestic animals. Emphasis will be on how these systems interact to regular circulation, gas exchange, acid-base balance, digestion and metabolism, location and adapting to environmental changes. Prereq: BIO 152, junior standing or consent of instructor. [*Offered in fall only.*]
- ASC 333 TOPICS IN ANIMAL SCIENCE (Subtitle required). (1-4)**
Intensive study in a unique aspect of animal agriculture not covered in other courses currently offered. May be repeated under a different subtitle two times to a maximum of 8 credits. Prereq: Specified by instructor for each offering.
- ASC 340 POULTRY PRODUCTION. (2)**
A study of the application of avian biology to modern poultry production. Topics include anatomy, physiology, reproduction, incubation and embryonic development, breeding and genetics, nutrition and feeding, disease control, housing and environmental control, management, poultry and egg products, and the structure of the poultry industry. For majors and non-majors. Prereq: ASC 101 or ASC 102 or equivalent or permission of the instructor. [*Offered in spring only.*]
- ASC 362 ANIMAL BREEDING AND GENETICS. (4)**
Study of genetics as applied to specific companion animals and livestock species. Roles of selection and mating systems and their expected consequences are examined when applied to qualitative and quantitative traits expressed by specific companion animals and various livestock species. Prereq: ASC 101, BIO 152. [*Offered in spring only.*]
- ASC 364 REPRODUCTIVE PHYSIOLOGY OF FARM ANIMALS. (4)**
Introduction to anatomy and physiological processes related to reproduction with a focus on farm animals. Evaluations of management procedures as they related to reproductive physiology. Prereq: ASC 101 and BIO 152. Primary registration access limited to College of Agriculture, Food and Environment majors and remaining seats open during secondary registration. [*Offered in spring only.*]
- ASC 378 ANIMAL NUTRITION AND FEEDING. (4)**
A fundamental study of the nutrients, their utilization and their role in the animal in conjunction with an applied understanding of the manner in which feedstuffs are evaluated and blended to meet the various species needs for those nutrients. Prereq: ASC 101 and CHE 230 or CHE 236. [*Offered in fall only.*]
- ASC 380 APPLIED ANIMAL NUTRITION. (3)**
The composition and nutritional characteristics of common feedstuffs. The digestive systems, nutritional requirements, formulated rations and economical feeding programs for farm animals. Prereq: ASC 378 or consent of instructor. [*Offered in fall (online).*]

ASC

Animal Sciences

ASC 382 ANIMAL PRODUCTION PRINCIPLES. (3)

A broad survey of animal agricultural management covering cattle, horses, poultry, swine, sheep and goats. Emphasis is placed on the practical application of scientific disciplines including anatomy, physiology, nutrition, reproduction and genetics. For nonmajors only. [Offered in spring only.]

ASC 388 COMPANION ANIMAL NUTRITION. (3)

This course offers an introductory look at the nutrition of companion animals, primarily the dog and cat. Basic concepts in nutrition, food chemistry, biochemistry, digestive physiology and microbiology will be addressed as they pertain to pet health and well being. Prereq: CHE 230 or CHE 236 or equivalent. [Offered in spring only.]

ASC 389 APPLIED EQUINE NUTRITION AND FEEDING. (2)

This course examines the feeding management of broodmares, growing horses, performance horses and horses with special needs. Lecture material covers common equine feeds, feed and ration analysis, factors influencing the utilization of feeds by horses, and factors affecting nutrient requirements and feeding management of the different classes of horses. Prereq: A course in nutrition or consent of instructor. [Offered in spring only.]

ASC 395 SPECIAL PROBLEM IN ANIMAL SCIENCES. (1-4)

Independent study in Animal Sciences under the supervision of a faculty member. May be repeated for a maximum of eight credits. Prereq: Consent of appropriate instructor. [Offered in fall and spring.]

ASC 399 EXPERIENTIAL LEARNING IN ANIMAL SCIENCES. (1-6)

A field-based learning experience in animal sciences under the supervision of a faculty member. May be repeated to a maximum of six credits on a pass/fail basis. Prereq: Consent of instructor and department chairperson and completion of a departmental learning contract before registration. [Offered in fall and spring.]

ASC 404G SHEEP SCIENCE. (4)

History and importance of the sheep industry; application of the principles of selection, breeding, feeding and management of sheep for efficient lamb and wool production. Lecture, three hours per week; laboratory, three hours per week. Prereq: ASC 300, ASC 362, ASC 364, ASC 378 or consent of instructor. [Offered in fall only.]

ASC 406 BEEF CATTLE SCIENCE. (4)

Scope and importance of the beef cattle industry; roles of the major cattle breeds and organizations associated with the beef cattle industry; application of equipment, identification, nutrition, reproduction, genetics, health, marketing, taxation and management principles to beef cattle production; impact of current economic, social and environmental issues on the beef cattle industry. Lecture, three hours; laboratory, three hours. Prereq: ASC 300, ASC 362, ASC 364 and ASC 378 or consent of instructor. [Offered in fall only.]

ASC 408G SWINE PRODUCTION. (3)

A study of scope and importance of the swine industry. Application of principles of breeding, reproduction, nutrition, housing, health, and management of swine in modern production systems. Prereq: ASC 101 and ASC 102. [Offered in spring only.]

ASC 410G EQUINE SCIENCE. (3)

Detailed study of the anatomy and physiology of the horse as they relate to the nutrition, reproduction, athletic ability, unsoundness and control of diseases and parasites. Lecture, two hours; laboratory, two hours. Prereq: ASC 310, ASC 364, and ASC 378. [Offered in spring only.]

ASC 420G DAIRY CATTLE MANAGEMENT. (3)

Scope and importance of the dairy cattle industry; selection, breeding, housing, feeding and management of dairy cattle. Lecture, two hours; laboratory, two hours. Prereq: ASC 325, ASC 364 and ASC 378 or consent of instructor. [Offered in fall only.]

†ASC 435 WILDLIFE SCIENCE AND APPLICATIONS.

ASC

Animal Sciences

- ASC 470 CAPSTONE FOR ANIMAL AGRICULTURE. (3)**
Discussion of the importance of livestock production to society and consideration of major issues impacting animal agriculture. Principles and practices learned in disciplinary and commodity Animal Sciences courses are integrated into a unified perspective, and the scientific method is employed as an approach to problem analysis and resolution. Refinement of skills in critical thinking, information gathering, writing, and oral communication is emphasized. Prereq: Senior standing in College of Agriculture, Animal Sciences major. [*Offered in fall and spring.*]
- ASC 499 ACADEMIC ENRICHMENT EXPERIENCE IN ANIMAL SCIENCES. (1)**
Development and evaluation of the student's required academic enrichment experience (study abroad, undergraduate research, internship, student mentorship, leadership, etc.) Prereq: Open to Animal Sciences majors only.
- ASC 564 MILK SECRETION. (3)**
Anatomy of the mammary gland, physiology and biochemistry of milk secretion and management factors affecting yield and composition of milk. Prereq: ASC 101 and BIO 152. [*Offered in spring only.*]
- ASC 601 MAMMALIAN ENDOCRINOLOGY. (3)**
An introduction to the basic anatomy, physiology and biochemistry of endocrine systems with emphasis on mechanisms of hormone synthesis, secretion and action. Lectures and reading assignments will focus on endocrine function in mammalian species, including laboratory animals, humans and livestock. Prereq: BCH 401G and BIO 350 or equivalents. (Same as PGY 601.)
- ASC 602 INTEGRATED NUTRITIONAL SCIENCES II. (3)**
Integrated study of the properties, metabolism, biochemical and physiological functions and interactions of vitamins and minerals, and their relationships to chronic diseases, deficiency symptoms and toxicity. Prereq: IBS 601, PGY 206. (Same as CNU/NS 602.) [*Offered in spring – odd years.*]
- ASC 630 ADVANCED MEAT SCIENCE. (4)**
Advanced meat science with special reference to the histological, chemical, physical and microbiological properties as they relate to meat quality, organoleptic acceptability and processing procedures. Lecture, three hours; laboratory, two hours. Prereq: FSC 304, FSC 306 or equivalent; one course in histology or biochemistry or consent of instructor. (Same as FSC 630.) [*Offered in spring – even years.*]
- ASC 660 BIOLOGY OF REPRODUCTION. (3)**
Advanced study of current topics in reproductive biology. The course is comprised equally of student-led discussions and lectures given by faculty with research expertise in selected topics. Readings will be taken from current and classic literature. Topics covered include (but are not limited to) molecular and cellular endocrinology, hormone receptors and mechanism of action, reproductive neuroendocrinology, reproductive behavior, gametogenesis, fertilization, sexual differentiation, puberty, menopause and environmental effects on reproduction. Emphasis will be placed on the analysis and understanding of the experimental basis for current concepts in reproductive biology. Prereq: ASC/PGY 601 and ASC 364 or BIO/PGY 502 or consent of instructor. (Same as PGY 660 and ANA 660.) [*Offered in spring – odd years.*]
- ASC 680 LABORATORY METHODS IN NUTRITIONAL SCIENCES. (4)**
The use of laboratory techniques and instrumentation in the solution of fundamental problems of nutrition. Lecture, one hour; laboratory, six hours. [*Offered in fall – odd years.*]
- ASC 681 ENERGY METABOLISM. (2)**
An in-depth discussion of nutritional energetics, from the standpoint of factors which influence the utilization of dietary energy. A critical review of current literature. Prereq: ASC 378 or equivalent, BCH 502 or equivalent or consent of instructor. [*Offered in spring – odd years.*]
- ASC 683 PROTEIN METABOLISM. (2)**
A study of the principles and present concepts of protein and amino acid nutrition and metabolism in the animal. Prereq: Graduate level biochemistry. [*Offered in fall only.*]
- ASC 684 ADVANCED RUMINANT NUTRITION. (3)**
Principles of ruminant metabolism in the utilization of feedstuffs for meat, milk, and wool production. Prereq: ASC 682 and two or more courses from ASC 681, ASC 683, ASC 685 and ASC 687 or consent of instructor. [*Offered in spring – even years.*]

ASC

Animal Sciences

- ASC 685 MINERAL METABOLISM. (2)**
An in-depth review of the function, requirement deficiency and toxicity of mineral elements in nutrition. Emphasis on the interactions between elements and current literature will be made. Prereq: ASC 378 or NFS 510 or equivalent, BCH 502 or equivalent or consent of instructor. [*Offered in spring – even years.*]
- ASC 686 ADVANCED NONRUMINANT NUTRITION. (3)**
A study of nutrient utilization as influenced by digestion, absorption and metabolism with emphasis on swine and poultry. Prereq: One course each in nutrition and biochemistry.
- ASC 687 VITAMIN METABOLISM. (2)**
Detailed study of the metabolism of vitamins and the role of vitamins in the metabolism of carbohydrates, proteins, lipids, and minerals. Prereq: BCH 502 or CHE 552 or consent of instructor. [*Offered in spring – odd years.*]
- ASC 688 EQUINE NUTRITION. (2)**
Detailed study of anatomical, physiological and microbiological factors influencing the nutritive requirements of the equine for maintenance, growth, reproduction, lactation and work. Prereq: One course in nutrition and physiology or biochemistry or consent of instructor. [*Offered in fall – even years.*]
- ASC 689 PHYSIOLOGY OF NUTRIENT DIGESTION AND ABSORPTION. (3)**
An analysis and comparison of the structure and function of mammalian and avian gastrointestinal tracts, of feedstuff digestive processes, and of specific mechanisms responsible for nutrient absorption in various cell types. Emphasis is placed on livestock and avian species. Prereq: Graduate level Biochemistry. [*Offered in fall – even years.*]
- ASC 690 MACRONUTRIENT METABOLISM IN DOMESTIC ANIMALS. (2)**
An in-depth study of macronutrient metabolism and how it can be influenced by nutrition in both ruminant and non-ruminant species. Students will learn the important principles of macronutrient metabolism in domestic animals through lectures, evaluation of the current scientific literature and presentations. Prereq: 3 credits in biochemistry (BCH 401G, IBS 601, or equivalent) and 3 credits in animal nutrition, or consent of the instructor.
- ASC 748 MASTER'S THESIS RESEARCH. (0)**
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed. [*Offered in fall, spring and summer.*]
- ASC 749 DISSERTATION RESEARCH. (0)**
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.
- ASC 767 DISSERTATION RESIDENCY CREDIT. (2)**
Residency credit for dissertation research after the qualifying examination. Students may register for this course in the semester of the qualifying examination. A minimum of two semesters are required as well as continuous enrollment (Fall and Spring) until the dissertation is completed and defended. [*Offered in fall, spring and summer.*]
- ASC 768 RESIDENCE CREDIT FOR THE MASTER'S DEGREE. (1-6)**
May be repeated to a maximum of 12 hours.
- ASC 769 RESIDENCE CREDIT FOR THE DOCTOR'S DEGREE. (0-12)**
May be repeated indefinitely.
- ASC 771 ANIMAL SCIENCE SEMINAR. (1)**
May be repeated twice for a maximum of three credits. [*Offered in fall and spring.*]
- ASC 777 ADVANCED TOPICS IN ANIMAL SCIENCE (Subtitle required). (1-4)**
Intensive study in a unique aspect of animal agriculture not covered in other graduate courses currently offered. May be repeated under a different subtitle two times to a maximum of 8 credits. Prereq: Permission of instructor.

ASC

Animal Sciences

- ASC 780 SPECIAL PROBLEMS IN ANIMAL DERIVED FOODS. (1-4)**
May be repeated for a maximum of nine credits. Prereq: Consent of graduate adviser. (Same as FSC 780.) [*Offered in fall and spring.*]
- ASC 781 SPECIAL PROBLEMS IN GENETICS AND ANIMAL BREEDING. (1-4)**
May be repeated to a maximum of nine credits. Prereq: Consent of graduate adviser. [*Offered in fall and spring.*]
- ASC 782 SPECIAL PROBLEMS IN ANIMAL NUTRITION. (1-4)**
May be repeated to a maximum of nine credits. Prereq: Consent of graduate adviser. [*Offered in fall and spring.*]
- ASC 783 SPECIAL PROBLEMS IN REPRODUCTIVE PHYSIOLOGY (Subtitle required). (1-4)**
Intensive study or investigation of topics in physiology not covered in formalized courses. May be repeated under different subtitle to a maximum of nine credits. Prereq: Consent of graduate adviser. [*Offered in fall and spring.*]
- ASC 790 RESEARCH IN ANIMAL DERIVED FOODS. (1-6)**
Problems involving original investigation. May be repeated for a maximum of nine credits. Prereq: Consent of graduate adviser. (Same as FSC 790.)
- ASC 791 RESEARCH IN GENETICS AND ANIMAL BREEDING. (1-6)**
Problems involving original investigation. May be repeated for a maximum of nine credits. Prereq: Consent of graduate adviser. [*Offered in fall and spring.*]
- ASC 792 RESEARCH IN ANIMAL NUTRITION. (1-6)**
Problems involving original investigation. May be repeated for a maximum of nine credits. Prereq: Consent of graduate adviser. [*Offered in fall and spring.*]
- ASC 793 RESEARCH IN REPRODUCTIVE PHYSIOLOGY (Subtitle required). (1-6)**
Original investigation of mechanisms and problems related to mammalian reproduction. May be repeated under different subtitle to a maximum of nine credits. Prereq: Consent of graduate adviser. [*Offered in fall and spring.*]
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Appendix J

Example Four-Year
Plans of Study for
Animal Sciences Animal
Industry, Food Industry,
and Pre-Professional
Options

Appendix J. Example Four-Year Plans of Study for Animal Sciences Options

Animal Industry Option

EXAMPLE Four Year Plan of Study

Fall Year 1

Course	Hrs.
ASC 101 Domestic Animal Biology	3
CHE 105 General Chemistry I	4
CHE 111 General Chem I Lab	1
CIS or WRD 110 Comp & Comm I	3
GEN 100 Issues in Ag, Food & Environment	3
Total	14

Spring Year 1

Course	Hrs.
ASC 102b Introduction to Livestock & Poultry Production	3
CHE 107 General Chemistry II	3
CHE 113 General Chemistry II Lab	2
CIS or WRD 111 Comp & Comm II	3
MA 113 or MA 123 or MA 137 Calculus	4
Total	15

Fall Year 2

Course	Hrs.
ASC 205 Career Development for ASC	1
BIO 148 Introduction to Biology I	3
CHE 230 or CHE 236 Organic Chemistry	3
Specialty Support Course	3
UK Core Global Dynamics	3
UK Core Humanities	3
Total	16

Spring Year 2

Course	Hrs.
BIO 152 Principles of Biology II	3
Specialty Support Course	3
STA 210 Intro to Stat Reasoning or STA 296 Stat Methods & Motivations	3
UK Core Arts & Creativity	3
WRD 203 Business Writing or WRD 204 Technical Writing	3
Total	15

Fall Year 3

Course	Hrs.
ASC 325 Animal Physiology	3
ASC 378a Animal Nutrition	4
Specialty Support Course	3
UK Core Social Science	3
Free Elective*	3
Total	16

Spring Year 3

Course	Hrs.
ASC 362b Animal Breeding & Genetics	4
ASC 364b Animal Reproduction	4
Specialty Support Course	3
Free Elective*	6
Total	17

Fall Year 4

Course	Hrs.
ASC 470 Capstone in Animal Science	3
ASC Production Elective	3-4
ASC Production Elective	3-4
Specialty Support Elective	3
Free Elective*	3
Total	15-17

Spring Year 4

Course	Hrs.
ASC 499 Academic Enrichment Experience in Animal Sciences**	1
ASC Production Elective	2-3
Specialty Support Elective	3
Free Elective*	6
Total	12-13

Production Electives

Offered

ASC 340 Poultry Production	Spring
ASC 404G Sheep Science	Fall
ASC 406 Beef Cattle Science	Fall
ASC 408G Swine Science	Spring
ASC 410G Equine Science	Spring
ASC 420G Dairy Cattle Management	Fall

120 hrs required for graduation

45 hrs of 300 level or higher required

Specialty support electives are approved 200 level or higher courses outside of ASC

a = only offered during fall

b = only offered during spring

* = Consider 300 level or higher electives

** = Requirement fulfilled via internship, study

abroad, undergrad research or peer instruction.

Must work with faculty member.

Work with your academic advisor to create an individualized plan.

Year 1

Course	Credit Hours
ASC 101a Domestic Animal Biology	3
CHE 105 General Chemistry I	4
CHE 111 General Chem I Lab	1
CIS/WRD 110 Composition I	3
GEN 100a Issues in Agriculture	3
MA 123/MA 113/MA 137 Calculus	4
Total	18

Course	Credit Hours
ASC 102b Applications of Animal Science	3
CHE 107 General Chemistry II	3
CHE 113 General Chemistry II Lab	2
CIS/WRD 111 Composition II	3
UK Core Social Science	3
Total	14

Year 2

Course	Credit Hours
ASC 205 Livestock, People & Interactions	1
BIO 148 Introduction to Biology	3
CHE 230 or CHE 236 Organic Chem	3
STA 210 Intro to Stats	3
UK Core Humanities	3
Total	13

Course	Credit Hours
BIO 152 Principles of Biology II	3
FSC 107b Food Science	3
UK Core Creativity in the Arts	3
UK Core Global Dynamic	3
Specialty Support Elective	3
Total	15

Year 3

Course	Credit Hours
ASC 300a Meat Science	4
ASC 325a Animal Physiology	3
ASC 378a Animal Nutrition	4
Specialty Support Elective	3
Specialty Support Elective	3
Total	16

Course	Credit Hours
ASC 362b Animal Genetics	4
ASC 364b Animal Reproduction	4
FSC 304b Animal Derived Foods	5
Specialty Support Elective	3
Total	16

Year 4

Course	Credit Hours
ASC 470 Capstone in Animal Science	3
ASC Production Elective	2-4
ASC Production Elective	2-4
WRD 203 Grad Writing Req	3
Specialty Support Elective	3
Total	13-17

Course	Credit Hours
ASC Production Elective	2-4
Specialty Support	3
Free Elective*	3
Free Elective*	3
Free Elective*	3
Total	14-16

Production Electives	Semester Offered
ASC 340 Poultry Production	Spring
ASC 404G Sheep Science	Fall
ASC 406 Beef Cattle Science	Fall
ASC 408G Swine Science	Spring
ASC 410G Equine Science	Spring
ASC 420G Dairy Cattle Science	Fall

a = only offered during fall
 b = only offered during spring
 * = Consider 300 level electives

UK Core Pre-Professional Option Plan of Study

Year 1

Course	Credit Hours
ASC 101a Domestic Animal Biology	3
CHE 105 General Chemistry I	4
CHE 111 General Chem I Lab	1
CIS/WRD 110 Composition I	3
GEN 100a Issues in Agriculture	3
MA 123/MA 113/MA 137 Calculus	4
Total	18

Course	Credit Hours
ASC 102b Applications of Animal Science	3
CHE 107 General Chemistry II	3
CHE 113 General Chemistry II Lab	2
CIS/WRD 111 Composition II	3
UK Core Global Dynamics	3
UK Core Social Science	3
Total	17

Year 2

Course	Credit Hours
ASC 205 Livestock, People & Interactions	1
BIO 148 Introduction to Biology	3
CHE 230 Organic Chem I	3
CHE 231 Organic Chem I Lab	1
UK Core Humanities	3
Free Elective*	3
Total	14

Course	Credit Hours
BIO 152 Principles of Biology II	3
CHE 232 Organic Chem II	3
CHE 233 Organic Chem II Lab	1
STA 210 Intro to Stats	3
UK Core Creativity in the Arts	3
Free Elective*	3
Total	16

Year 3

Course	Credit Hours
ASC 325a Animal Physiology	3
ASC 378a Animal Nutrition	4
BIO 304 Genetics	4
PHY 211 Physics I	5
Total	16

Course	Credit Hours
ASC 362b Animal Genetics	4
ASC 364b Animal Reproduction	4
PHY 213 Physics II	5
Free Elective*	3
Total	16

Year 4

Course	Credit Hours
ASC 470 Capstone in Animal	3
ASC Production Elective	2-4
ASC Production Elective	2-4
WRD 203 Grad Writing Req	3
Free Elective*	3
Total	13-17

Course	Credit Hours
ASC Production Elective	2-4
Free Elective*	3
Free Elective*	3
Free Elective*	3
Total	11-13

Production Electives	Semester Offered
ASC 340 Poultry Production	Spring
ASC 404G Sheep Science	Fall
ASC 406 Beef Cattle Science	Fall
ASC 408G Swine Science	Spring
ASC 410G Equine Science	Spring
ASC 420G Dairy Cattle Science	Fall

a = only offered during fall

b = only offered during spring

* = Consider 300 level electives

Appendix K

Professional Activities
by Individual Faculty
and Staff to Improve
Instructional Efforts

APPENDIX K

Professional Activities by Individual Faculty and Staff to Improve Instructional Efforts

Debra K. Aaron

2013

- Invited speaker, “Incorporating Active Learning Practices in Animal Sciences Classrooms” in Teaching and Learning in the Animal Sciences: New Grounds for the 21st Century, ASAS/ADSA

2014

- Symposium, Teaching and Learning in the University of the XXI Century, Argentinean Congress of Animal Production/Congress of Chilean Society of Animal Production
 - Invited Speaker, “Incorporating Active Learning Practices in Animal Sciences Classrooms”
 - Panelist, “Challenges in Teaching and Learning in Animal Sciences Undergraduate Curricula”

2015

- Lead organizer and chair, INNOVATE 2015, Innovations in Education: An Animal Science Curriculum for the 21st Century, ASAS
 - Invited Speaker, “Do Extracurricular Activities Enhance Student Learning?”
 - Panelist, “Improving Student Success Before and After Graduation”

Tayo Adedokun

2015

- University of Kentucky Seminars, Training, and Workshops:
 - Canvas Training
 - Working with Distressed and Distressing Students

2016

- University of Kentucky Center for the Enhancement of Teaching and Learning (CELT) Seminars and Training:
 - Backward Design
 - Teaching for Student Success: Who Are Our Students? A Student Panel Discussion
 - Critical Conversations about Race and Teaching: Race and Cultural Competencies—A Student Perspective
 - How Do I Handle This? Challenging Situations In and Out of the Classroom
 - The Right Tools—Selecting Technology Strategically and Effectively
 - A Discussion on Inclusive Teaching and Challenges
 - Cheating
 - The Good, the Bad, and the Ugly: Teacher and Course Evaluations
- Individual Assessment (CELT):
 - One-on-one meeting with team led by Dr. Bill Burke
 - Met with a representative to discuss mid-semester review/assessment of ASC 378

Phillip Bridges2012

- University of Kentucky CELT classroom evaluation and feedback (ASC 364)

Roberta Dwyer2014

- Lilly Teaching Conference

2016

- QPR Suicide Awareness Training.

2014-2016

- Veterinary Continuing Education, 50 hours/year.

Don Ely2015

- INNOVATE 2015, Innovations in Education: An Animal Science Curriculum for the 21st Century, ASAS
 - Invited Speaker, “What Makes a Quality Teacher?”
 - Panelist, “The Connection between Teaching Quality and Student Learning.”

Ann Leed2012

- NACADA National Meeting
- University of Kentucky Seminars, Training, and Workshops:
 - Diversity Training
 - Blackboard Training
 - Veteran’s Training
 - CELT Challenges and Opportunities of Large Classes
- Education Innovation Summit
- College of Agriculture, Food and Environment Student Success and Retention Workshop

2013

- CELT Workshops

2014

- University of Kentucky Seminars, Training, and Workshops:
 - Active Shooter Workshop
 - UK’s Speaking with One Voice Workshop
 - UK’s It Takes a Campus–Prospective Student Visits Workshop
- NACADA Region 3 Meeting

2015

- INNOVATE 2015, Innovations in Education: An Animal Science Curriculum for the 21st Century, ASAS
 - Invited Speaker, “Academic Advising: Improving the Odds for Success.”
 - Panelist, “Improving Student Success Before and After Graduation.”
- University of Kentucky Training, Workshops and Retreats:
 - UK Student Success Retreat
 - Canvas Training
 - Campus Advising Retreat

- Faculty Fellow Program
- NACADA Region 3 Meetings

2016

- University of Kentucky Seminars, Training, and Workshops:
 - myUK, myGPS Training
 - QPR Training–Suicide Prevention
 - Student Success Team Lunch and Learn–Counseling Center and Disability Resource Center Training

2017

- University of Kentucky Student Success Team Lunch and Learn–Student Financial Wellness

Colette Tebeau

2016

- IRIS SAP Training:
 - Awareness and Navigation
 - Student Lifecycle Management Overview
 - Advising
 - Student Records Booking
- University of Kentucky Seminars, Training, and Workshops:
 - Preventing Discrimination and Sexual Harassment
 - FERPA Compliance
 - myUK, myGPS Training
 - Adobe InDesign 101
 - Drupal Training
 - Advisor Training–Helping Students
 - One Drive Training
 - Advisor Training–GPS and Other Technologies

2017

- University of Kentucky Seminars, Training, and Workshops:
 - Social Media Workshop
 - Tableau Workshop
 - Advising the Pre-Vet Student
 - Student Financial Wellness
 - Social Media Workshop- Instagram
 - Active Shooter Forum
 - Cheating–Curbing, Catching, Consequences
 - Indigo Inventory Training
 - Best Practices
 - Unconscious Bias Training
 - Education Abroad
 - UK Advisors Professional Development/Great Day of Service
 - SeeBlueU Workshop
- IRIS SAP–Grading Module Training
- VMCAS 2018 workshop
- LMU-CVM Preview Day

Kristine Urshel

2011

- National Association of Equine Affiliated Academics Annual Meeting

2012

- University of Kentucky Student Success and Retention

2013

- University of Kentucky Seminars and Training:
 - How do I Handle This? Challenging Situations In and Out of the Classroom
 - How to Work with Distressed and Distressing Students
- National Association of Equine Affiliated Academics Annual Meeting

2015

- National Association of Equine Affiliated Academics Annual Meeting

2016

- University of Kentucky Seminars and Training:
 - Lunch and Learn Center for the Enhancement of Teaching and Learning
 - QPR Suicide Prevention Training

2017

- University of Kentucky Cheating–Curbing, Catching and Consequences
- National Association of Equine Affiliated Academics Annual Meeting

Eric Vanzant

2014

- University of Kentucky Presentation U Faculty Fellows Program

2017

- Agricultural Animal Bioethics Workshop, Indianapolis, IN

Jackie Wahrmond

2016

- CELT Workshops:
 - Slide Design
 - Teaching Portfolios
 - Student Evaluations
 - Managing Micro-Aggressions
 - Universal Design in Canvas

2017

- CELT Workshops:
 - Student Financial Wellness
 - Creative Assignments to Enhance Student Learning and Engagement
 - Student Motivation and Engagement Online
- National Association of Equine Affiliated Academics Conference
- North American Colleges and Teachers of Agriculture Conference

Appendix L

2016-17 Undergraduate
Degree Major Sheet for
Food Science



Food Science

College of Agriculture, Food and Environment

Food science is the study of the transformation of biological materials into food products acceptable for human consumption. This requires studying diverse scientific disciplines related to food, including chemistry, engineering, microbiology, biochemistry, toxicology, and management; and effectively applying the industrial and practical aspects to product development, food processing, preservation, and marketing. The program is administered by the Department of Animal and Food Sciences and offers training in the basic sciences and in the fundamentals of food science.

Career opportunities in food industries include: management, research and development of new food products and ingredients, process supervision, quality control, procurement, distribution, sales, and merchandising. Positions include sales and services in allied industries; consulting and trade association activities; and promotional and educational services. Governmental agencies employ food scientists whose work is directed towards research, regulatory control, and the development of food standards.

Graduation Requirements

To earn the Bachelor of Science in Food Science, the student must complete a minimum of 128 semester hours with at least 45 hours from courses at the 300 level and above. A 2.0 grade-point standing (on a 4.0 scale) is necessary and remedial courses may **not** be counted toward the total hours required for the degree.

The Food Science program meets the requirements for accreditation by the Institute of Food Technologists and the National Organization of Food Science Professionals.

Each student must complete the following:

UK Core Requirements

See the *UK Core* section of the 2016-2017 *Undergraduate Bulletin* for the complete UK Core requirements. The courses listed below are (a) recommended by the college, or (b) required courses that also fulfill UK Core areas. Students should work closely with their advisor to complete the UK Core requirements.

I. Intellectual Inquiry in Arts and Creativity	
Choose one course from approved list	3
II. Intellectual Inquiry in the Humanities	
Choose one course from approved list	3
III. Intellectual Inquiry in the Social Sciences	
Choose one course from approved list	3
IV. Intellectual Inquiry in the Natural, Physical, and Mathematical Sciences	
CHE 105 General College Chemistry I	4
CHE 111 Laboratory to Accompany General Chemistry I	1
V. Composition and Communication I	
CIS/WRD 110 Composition and Communication I	3
VI. Composition and Communication II	
CIS/WRD 111 Composition and Communication II	3
VII. Quantitative Foundations	
MA 113 Calculus I	
or	
MA 123 Elementary Calculus and Its Applications	
or	
MA 137 Calculus I With Life Science Applications	4

VIII. Statistical Inferential Reasoning	
STA 296 Statistical Methods and Motivations	3

IX. Community, Culture and Citizenship in the USA	
GEN 100 Issues in Agriculture, Food and Environment	3

X. Global Dynamics	
Choose one course from approved list	3
UK Core hours	33

Graduation Composition and Communication Requirement (GCCR)	
WRD 203 Business Writing	3
Graduation Composition and Communication Requirement hours (GCCR)	3

Premajor Requirements	Hours
BIO 148 Introductory Biology I	3
BIO 152 Principles of Biology II	3
ECO 201 Principles of Economics I	3
BIO 208 Principles of Microbiology	3
BIO 209 Introductory Microbiology Laboratory	2
CHE 105 General College Chemistry I	4
CHE 107 General College Chemistry II	3
CHE 111 Laboratory to Accompany General Chemistry I	1
CHE 113 Laboratory to Accompany General Chemistry II	2
CHE 236 Survey of Organic Chemistry	
or	
CHE 230 Organic Chemistry I	3
DHN 212 Introductory Nutrition	3
MA 113 Calculus I	
or	
MA 123 Elementary Calculus and Its Applications	
or	
MA 137 Calculus I With Life Science Applications	4
STA 296 Statistical Methods and Motivations	3
Subtotal: Premajor hours	37

Major Requirements	Hours
Required:	
FSC 107 Introduction to Food Science	3
FSC 306 Introduction to Food Processing	4
FSC 395 Special Problems in Food Science	3
or	
FSC 399 Experiential Learning in Animal Sciences/Food Science	3
or	
EXP 396 Experiential Education	3-6
FSC 434G Food Chemistry	4
FSC 530 Food Microbiology	5
FSC 535 Food Analysis	4
FSC 536 Advanced Food Technology	4

- CONTINUED -

University of Kentucky is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award associate, baccalaureate, masters, and doctorate degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call 404-679-4500, or online at www.sacscoc.org for questions about the accreditation of University of Kentucky.

Food Science • 2

plus at least three of the following courses:

FSC 304 Animal Food Products	4
FSC 430 Sensory Evaluation of Foods	3
FSC 538 Food Fermentation and Thermal Processing	4
FSC 540 Food Sanitation	3
Subtotal: Major hours	38-41

Specialty Support

AEN 340 Principles of Food Engineering	4
DHN 311 Nutritional Biochemistry	
or	
BCH 401G Fundamentals of Biochemistry	3
PHY 211 General Physics	5

plus two of the following courses:

AEC 305 Food and Agricultural Marketing Principles	3
ASC 300 Meat Science	4
CLD 230 Intrapersonal Leadership	
or	
CLD 340 Community Interaction	3
Subtotal: Specialty Support	18-19

Electives

Elective courses should be selected by the student to lead to the minimum total of 120 hours required for graduation.

Subtotal: Electives	6
TOTAL HOURS:	120

Appendix M

Food Science Undergraduate Course Descriptions

FSC

Food Science

FSC 107 INTRODUCTION TO FOOD SCIENCE. (3)

A general basic food science course that deals with world food needs and available food supplies, types of food and nutritive values and use, food processing technology and distribution methods.

FSC 304 ANIMAL DERIVED FOODS. (5)

Principles of red meat, poultry, fish and dairy processing; physical and chemical composition and nutritive values of meat, dairy and egg products; structure and identification of muscle; inspection, grading, formulation, processing and preservation methods; organoleptic properties and consumer acceptance of processed meat, dairy and egg products. Lecture, three hours; laboratory, four hours per week. Prereq: GEN 106 or GEN 107.

FSC 306 INTRODUCTION TO FOOD PROCESSING. (4)

Commercial processing of foods including theory and use of heat exchangers, separators, freezers, air and vacuum dryers, evaporators, membrane separation, electrodialysis, emulsion formers, extruders, and irradiators. Physico-chemical changes in osmotic pressure, vapor pressure, pH surface tension, viscosity, emulsification and colloidal dispersions in processed foods will be discussed. Processing of waste streams will also be discussed. Prereq: CHE 105, CHE 107, CHE 236.

FSC 395 SPECIAL PROBLEM IN ANIMAL SCIENCE/FOOD SCIENCE. (1-4)

Independent study in animal and food science under the supervision of a faculty member. May be repeated for a maximum of eight credits. Prereq: Consent of appropriate instructor. (Same as ASC 395.)

FSC 399 EXPERIENTIAL LEARNING IN ANIMAL SCIENCES/FOOD SCIENCE. (1-6)

A field-based learning experience in animal sciences and food science under the supervision of a faculty member. May be repeated for a maximum of six credits as an elective on a pass/fail basis. Prereq: Consent of instructor and department chairperson and completion of a departmental learning contract before registration. (Same as ASC 399.)

FSC 430 SENSORY EVALUATION OF FOODS. (3)

This course deals with the sensory evaluation methods used for food products based on flavor, odor, color, and texture. This includes techniques for measuring sensory attributes, instrumental analysis of foods, statistical analyses of data, and how sensory evaluation programs are utilized in the food industry. Prereq: STA 291 and FSC 306, or NFS 304 (prerequisite or concurrent enrollment).

FSC 434G FOOD CHEMISTRY. (4)

Chemical and physical properties of proteins, lipids, carbohydrates, pigments and food additives as they relate to food processing and food preservation. Lecture, three hours; laboratory, two hours. Prereq: BCH 401G or consent of instructor.

FSC 530 FOOD MICROBIOLOGY. (5)

Study of procedures for the enumeration and identification of foodborne microorganisms important in the food industry. Principles for controlling contamination and growth of microorganisms during production, processing, handling and distribution of food products. Lecture, three hours; laboratory, four hours. Prereq: BIO 108 and BIO 109 or equivalent.

FSC 535 FOOD ANALYSIS. (4)

Techniques and instrumentation used to determine the chemical composition of foods. Emphasis is placed on the principles of chemical analysis as it relates to foods and food processing. Lecture, two hours; laboratory, four hours per week. Prereq: FSC 434G.

FSC 536 ADVANCED FOOD TECHNOLOGY. (4)

Concepts of developing/improving new food products or food processing including: consumer awareness, marketing, ingredient specifications, product formulation, stabilization of product, packaging to meet shelf life goals, shelf testing of products, challenge testing, establishment of HACCP system, consumers testing, market testing, and introduction to the market. A capstone course, where all concepts of food science are used to extend or create new food products for the market place. Lecture, three hours; laboratory, two hours. Prereq: AEN 340, FSC 306, and FSC 335; or consent of instructor.

FSC 538 FOOD FERMENTATION AND THERMAL PROCESSING. (4)

Thermal processing of foods. The use of microorganisms in the preservation of raw foods and the manufacture of new foods. Manipulation and improvement of cultures to ensure production of desirable end products. Lecture, three hours; laboratory, two hours. Prereq: BIO 108, BIO 109, BIO 476G, FSC 530 or consent of instructor.

FSC 540 FOOD SANITATION.

(3)

A study of sanitation principles and techniques for ensuring the safety and wholesomeness of our food supply. Prereq: FSC 530 or equivalent.

Appendix N

Food Science IFT Accreditation Packet

2014 Application for Re-approval from the Institute of Food Technologists (IFT)

August, 2014



Luke Boatright, Ph.D.

Lexington, KY 40546-0215

E-Mail: luke.boatright@uky.edu Web: <http://afs.ca.uky.edu/fsc>

Table of Contents

Topic	Page
Applicant and Program Information	3
• Date of Submission	
• Person Completing this Application	
• Description of Administrative Unit	
• Description of Faculty	
• Description of Facilities	
• Description of Curriculum	
Primary Program Student Learning Outcomes for Food Science Majors	8
Summary of Assessment over the Previous 5-Year Cycle	9
Core Curriculum Assessment Cycle 2010-2012	9
Core Curriculum Assessment Cycle 2012-2013	9
• Assessment Tools, Procedures and Evaluations	
• Summary of Assessment Activities	
• Primary Program Modifications as a Result of Assessment	
Core Curriculum Assessment Cycle 2013-2014.	29
• Assessment Tools, Procedures and Evaluations	
• Summary of Assessment Activities	
• Primary Program Modifications as a Result of Assessment	
Future Goals and Planning for Improvement	51
Appendix 1: 2011-12 IFT Annual Assessment Report.	53
Appendix 2: Food Science Internship Learning Contract & Online Evaluation Form..	94
Appendix 3: Food Science Program Curriculum Map 2014 (Graphic)	106
Appendix 4: Undergraduate Food Science IFT Core Competencies	107
Appendix 5: Food Science Syllabi used in the Development of the Program Graduation Composition and Communication Requirement	109
Appendix 6: UK Food Science Program 5-Year Assessment Plan	125
Appendix 7: Course Change Form for FSC 304 “Animal Food Products”	126

2014 Application for Re-approval from the Institute of Food Technologists (IFT)

I. Date of application submission August 21, 2014

II. Name of person completing this application William L. Boatright

Professional title Professor

Mail address University of Kentucky
Department of Animal & Food Sciences
412 W.P. Garrigus Building

E-mail address luke.boatright@uky.edu

Office phone number 859-257-5988

Fax number 859-257-7537

III. Description of administrative unit

A. Name of Institution University of Kentucky

B. Name of College College of Agriculture, Food & Environment (CAFE)

C. Name of Department Department of Animal & Food Sciences

D. Name of Department Head/Chair Robert J. Harmon

E. All undergraduate degrees (including emphases) granted by the Department (e.g., BSA in Food Science, BS in Food Technology with Food Industry Emphasis, BS in Nutritional Science)

B.S. in Food Science
B.S. in Animal Sciences

F. Of those above, degree(s) (including emphases) to be evaluated for IFT approval

B.S. in Food Science

IV. Description of faculty (1-2 pages)

Food Science and other faculty members teaching in the program (place an asterisk by course numbers of required courses)

<u>Name</u>	<u>Highest Degree and Institution</u>	<u>Appointment[§]</u>	<u>Specialization (s)</u>	<u>Courses Taught</u>
Clair L. Hicks	Ph.D. Univ. of Wisconsin	Full-time Faculty	Dairy Chemistry	FSC 306*, FSC 430*, FSC 536*, FSC 636
Youling L. Xiong	Ph. D. Washington State	Full-time Faculty	Protein Chemistry	FSC 434G*, FSC 630, FSC 638
William L. Boatright	Ph. D. Univ. of Arkansas	Full-time Faculty	Food Chemistry	FSC 434G*, FSC 535*, FSC 640
Melissa C. Newman	Ph. E. Univ. of Kentucky	Full-time Faculty	Food Microbiology	FSC 530*, FSC 540, FSC 632
Gregg K. Rentfrow	Ph.D. Univ. Missouri	Full-time Faculty	Meat Science	ASC 300, ASC 303, ASC 309
Surendranath Suman	Ph.D. Univ of Connecticut	Full-time Faculty	Muscle Foods	ASC 304*, FSC 430*, FSC 642
Fred Payne	Ph.D. Univ. of Kentucky	Full-time Faculty	Food Engineering	AEN 340*

Any extenuating circumstances regarding faculty that should be considered

Joe O'Leary (Ph.D. Minnesota) is partially retired as Jan. 2014 and is teaching FSC 107* in the Spring 2014. A faculty search is currently in progress.

Fred Payne's appointment is within the University of Kentucky's Biosystems and Agricultural Engineering Department. Dr. Payne retired in the spring of 2014, and beginning in the fall of 2014 Dr. Bode Adedeji will be teaching our programs Food Engineering class. The Food Science faculty were heavily involved in the search committee, interviewing process and hire process for this position.

[§] Explain appointment status in the Department, e.g., member, adjunct, courtesy, joint, full-time, part-time)

V. Description of facilities (<1 page)

A. Website describing and providing pictures of Department facilities:
<http://afs.ca.uky.edu/FoodScience>

B. Please examine the Description of Facilities section in your most recent approval application and list any changes, additions, or deletions to your facilities since that time.

Other than some equipment upgrades, the Food Science teaching facilities are similar to those reported in our 2009 IFT accreditation application. The most significant change is the implementation of our “Food Systems Innovation Center” (FSIC). The FSIC was created to assist processors, producers and entrepreneurs to maximize their market capabilities by having access to UK’s technical and business expertise. The center is a collaborative effort of a number of departments within the College of Agriculture, Food and Environment including the Department of Animal and Food Science and the Department of Agricultural Economics. While still in the development stage, the FSIC will have the capability to expand opportunities for our undergraduate students in the areas of food processing and industry internships. FSICs technical Services include process validation studies, sensory panels, shelf life evaluation, pH and other chemical analyses. Market studies such as consumer, sensory and demand studies are also available to provide clients with market intelligence to make informed decisions. In addition, the FSIC offers HACCP and food defense training and administers Market-Ready training for producers that want to sell to restaurants, distribution chains and retailers.

VI. Description of curriculum (2 pages)

(Repeat this section for each degree or emphasis to be evaluated)

A. Specific website containing course descriptions for both background and departmental courses <http://afs.ca.uky.edu/FoodScience/instruction>, <http://afs.ca.uky.edu/FoodScience/instruction/courses>, and <http://www.uky.edu/registrar/bulletinCurrent/Bulletin.pdf>.

B. Suggested Road Map, showing semester-by-semester progress through the entire curriculum (show one for each curriculum being considered for approval)

First Year (must complete foreign language graduation requirement)

Fall Semester (18 hours)

- CIS/WRD 110 Composition & Communication I (3)
- MA 110 Algebra & Trigonometry for Calculus (4) (leading to MA 137) or MA 123 Elementary Calculus & Its Applications (4) (leading to MA162)
- CHE 105 General College Chemistry I (4)
- CHE 111 General Chemistry Lab I (1)
- ECO 201 Principles of Economics (3)
- GEN 100 Community, Culture and Citizenship (3)

Spring Semester (17-18 hours)

- FSC 107 Introduction to Food Science (3)

- CHE 107 General College Chemistry II (3)
- CHE 113 General Chemistry Lab II (2)
- BIO 148 Principles of Biology I (3)
- STA 210 (296 to replace 210 & 291) Introduction Statistical Reasoning (3)
- MA 137 Calculus I with Life Science Applications (4) or MA 162 Finite Mathematics & Its Application (3)

Second Year

Fall Semester (17 hours)

- BIO 152 Principles of Biology II (3)
- CHE 236 Organic Chemistry (3)
- PHY 211 General Physics (5)
- UK Core Humanities Requirement (3)
- CIS/WRD 111 Composition & Communication II (3)

Spring Semester (14 hours)

- UK Core Arts & Creativity Requirement (3)
- WRD 203 Business Writing (3) – 2nd Tier Graduation Writing Requirement
- BIO 208 Principles of Microbiology (3)
- BIO 209 Introductory Microbiology Laboratory (2)
- UK Core Social Sciences Requirement (3)

Third Year

Fall Semester (18 hours)

- FSC 306 Food Processing (4)
- AEN 340 Principles of Food Engineering (even year) (4)
- DNH 311 Nutritional Biochemistry or BCH 401G Fundamentals of Biochem (3)
- ASC 300 Meat Science (4)
- STA 291 Statistical Methods (3)

Spring Semester (17 hours)

- NFS 212 Introductory Nutrition (3)
- FSC 304 Animal Derived Foods (4)
- FSC 434G Food Chemistry (4)
- AEC 305 Food & Agriculture Marketing Principles (3)
- CLS 203 Leadership Studies (3) – Specialty Support

Fourth Year

Fall Semester (16 hours)

- FSC 530 Food Microbiology (5)
- FSC 535 Foods Analysis (4)
- FSC 538 Food Fermentation & Thermal Processing (4)
- FSC 430 Sensory Analysis (3)

Spring Semester (8 hours)

- FSC 536 Advanced Food Technology (4)
- *FSC 395 Special Problems or *FSC 399 Experimental Learning (4)

*College Academic Enrichment Experience **Requirement**

C. Please examine the Description of Curriculum section in your most recent approval application and list any changes, additions, or deletions to your curriculum since that time.

Food Science undergraduate program curriculum has been modified to align with the changes in the universities Core (General Education Requirements) offerings, college requirements and IFT requirements. The University of Kentucky completed the change over from the Universal Studies Program (USP) to the UK CORE General Education requirements to enhance the critical thinking process of all students earning a 4 year degree. With these changes certain core courses and new courses were developed to foster student critical thinking. The UK CORE courses make up 33 credit hours of the new food science curriculum. Chemistry 105 shifted to 4 credit hours, Bio 150 was dropped for new Biology 148 course and Statistics 296 will be implemented in spring of 2015. All students must make a C or better in Chemistry 105 and 107 before they are eligible to move into a more advanced chemistry class. New “first-tier” English classes WRD 110 and WRD 111 were instituted to enhance the writing ability of students. When the UK CORE courses were initiated Math 132 was discontinued (old option MA 123 and MA 132), thus food science math options were shifted to either MA 110 (algebra & trig.) or MA 137 (calculus), or MA 123 (elemental calculus) and MA 162 (finite), which is best for advanced statistics. Additional Food Science curriculum changes have been made to align with university and college requirements. Gen 100 is required for all freshmen. Gen 200 has been dropped. Key course content remains the same, but electives dropped from 11 credit hours to 3, to bring the new requirements from 128 to 123 hours. University’s goal is to have all majors at or near the 120 credit hour level at time of graduation. The Food Science program shifted some key courses into Core offerings and placed other support courses into either pre-major required courses or required technical elective titled courses. However, the total food science course offerings remained essentially the same. The course name of “Nutritional Biochemistry” was changed from NFS 311 to DHN 311 due to a department name change.

Food Science course contents that has been change as a direct result of assessment activities include FSC 430 (sensory evaluation) has change to bring more statistics into the course content and is now among the programs required courses. FSC 304 (meat processing) was changed from a 5 credit hour course to a 4 and aligned with FSC 306 (4 credit hour, food processing) to make two equivalent processing courses with non-overlapping subject matter. The Food Science program also requires all students to have an Academic Enrichment Experience (AEE). Food Science has a very strong internship program (FSC 399) and special problem program (FSC 395) which have been modified to meet these requirements. In special cases where students do a special study abroad program, EXP396 can be utilized. Beginning in 2014-15 Food Science students will be required to fulfill a new Graduation Composition and Communication Requirement (GCCR) as described in this application.

VII. Program Outcomes and Assessments:

Program outcomes for Food Science majors have been evaluated on an on-going basis. These program outcomes are periodically reviewed and revised by the food science faculty in response to input from stakeholders and educators.

Primary Program Student Learning Outcomes for Food Science Majors

Graduates of the University of Kentucky undergraduate Food Science program will be able to:

1. Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development.
2. Apply quality assurance procedures in food processing such as Hazard Analysis and Critical Control Points (HACCP) toward the production of safe and nutritious foods.
3. Be able to effectively use federal laws and regulations toward the development, manufacture and sale of foods and food products.
4. Evaluate and recommend appropriate laboratory techniques relevant to a particular application or problem.
5. Efficiently organize and manage assignments in an ethical and professional manner in order to meet deadline challenges.
6. Be able to select, evaluate, and convey scientific information using communication and information technology skills to individuals or groups at various education levels.
7. Apply a thorough academic background in food science and related disciplines toward successful entry-level employment within the food industry, or for transition to a food science graduate program.

VIII. Summary of assessments over the previous 5-year period

2010-2012 Curriculum Assessment Cycle

In May 2010 the Food Science program at the University of Kentucky as approved by the IFT HERB. In the approval letter there were two areas of focus that the IFT HERB requested to be addressed in subsequent applications. The first was evidence of more input from industry professionals involved with our internship program. The second was how we have addressed/improved student participation in leadership activities. Both of these areas have been addressed in detail in this current application. Since the last IFT Re-approval accreditation by IFT in 2010, the University of Kentucky has been required to submit a yearly update to the IFT HERB in August 2012 and again in August 2013. A copy of our assessment report for 2011-12 is included (as requested) in **Appendix 1**.

Food Science Student Learning Outcomes Evaluated:

- #5 Efficiently organize and manage assignments in an ethical and professional manner in order to meet deadline challenges.

- #7 Apply a thorough academic background in food science and related disciplines toward successful entry-level employment within the food industry, or for transition to a food science graduate program

During most of the period from 2010-2012, our assessment committee struggled with the type of assessment documentation that was required for a successful representation of our efforts. The letter supplied by the IFT HERB in December 2012 was extremely helpful in describing what our reporting document should include and how it should be formatted. This documentation also coincided with our receipt of a University of Kentucky document that expressed the same fundamental ideas. A summary of the 2012-13 report and our follow-up assessments (2013-14) are included in the body of this current application.

2012-2013 Curriculum Assessment Cycle

Food Science Student Learning Outcomes Evaluated:

- #1 Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development.

- #4 Evaluate and recommend appropriate laboratory techniques relevant to a particular application or problem.

- #5 Efficiently organize and manage assignments in an ethical and professional manner in order to meet deadline challenges.

#6 Be able to select, evaluate, and convey scientific information to individuals or groups at various educational levels.

Assessment Tools, Procedures and Evaluations:

Spring 2012-13 Assessment Rubric and Results for BS Food Science Student Learning Outcome 1 - Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development.

Student Learning Outcome/Primary Core Competency	Project or Activity Assessed, Date and Evaluator	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Class Score
Graduates will meet the "Undergraduate Education Standards for Degrees in Food Science" Accreditation Requirement of the Institute of Food Technologies as outlined in the 2011 Resource Guide for Approval and Re-Approval of Undergraduate Food Science Programs						
Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development. /Demonstrate the ability to apply and incorporate the principles of Food Science in practical, real-world situations and problems.		Demonstrates a basic understanding of food science principles	Can apply the principles of basic operations encountered in the food industry	Demonstrates a understanding of complex food science principles and has some capacity to apply these to real-world situations.	Possess a strong knowledge of basic food science principles and can demonstrate the ability to apply these principles in complex situations (specific to different types of products) encountered in the food industry	
	FSC 536, Specific Exam Questions and Components of the "CEO Report" Spring 2013 Dr. Clair Hicks	(0)	(4)	(4)	(7)	3.2
	FSC 430, Specific Exam Questions & segments of lab reports, Fall 2012, Dr. Suman	(0)	(2)	(10)	(8)	3.3
	FSC 304, Specific Exam Questions and segments of lab reports, Spring 2012, Dr. Suman	(0)	(2)	(2)	(0)	2.5

Values in parentheses are the number of individuals that scored in a particular category.

Spring 2012-13 Assessment Rubric and Results for BS Food Science Student Learning Outcome 6 - Be able to select, evaluate, and convey scientific information to individuals or groups at various educational levels.

Student Learning Outcome/Primary Core Competency	Project or Activity Assessed, Date and Evaluator	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Class Score
Graduates will meet the "Undergraduate Education Standards for Degrees in Food Science" Accreditation Requirement of the Institute of Food Technologies as outlined in the 2011 Resource Guide for Approval and Re-Approval of Undergraduate Food Science Programs						
Be able to select, evaluate, and convey scientific information to individuals or groups at various educational levels. / Know how to use computers to solve Food Science problems.	FSC 536, Specific Exam Questions and Components of the "CEO Report" Spring 2013 Dr. Clair Hicks	Demonstrates a basic understanding of food science principles	Can apply the principles of basic operations encountered in the food industry	Demonstrates a understanding of complex food science principles and has some capacity to apply these to real-world situations.	Possess a strong knowledge of basic food science principles and can demonstrate the ability to apply these principles in complex situations (specific to different types of products) encountered in the food industry	3.2
	FSC 430, Specific Exam Questions & segments of lab reports, Fall 2012, Dr. Suman					3.3
	FSC 304, Specific Exam Questions and segments of lab reports, Spring 2012, Dr. Suman					2.6

Spring 2012-13 Assessment Rubric and Results for BS Food Science Student Learning Outcome 4 - Evaluate and recommend appropriate laboratory techniques relevant to a particular application or problem.

Student Learning Outcome/Primary Core Competency	Project or Activity Assessed, Date and Evaluator	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Class Score
Graduates will meet the "Undergraduate Education Standards for Degrees in Food Science" Accreditation Requirement of the Institute of Food Technologies as outlined in the 2011 Resource Guide for Approval and Re-Approval of Undergraduate Food Science Programs						
Evaluate and recommend appropriate laboratory techniques relevant to a particular application or problem. / Be able to apply statistical principles to Food Science applications		Demonstrate understanding of basic statistical principles	Can apply the principles of statistics in basic operations encountered in the food science field	Can apply statistical principles of in complex situations encountered in the food science field	Can apply statistical principles in the food science field in complex situations (specific to complex applications)	
	FSC 536, Select exam questions & Components of the "CEO Report" Spring 2013	(0)	(1)	(0)	(14)	3.9
	UK Core statistics Course STA 291, Course grades, Fall 2010 - 2012,	(2)	(1)	(12)	(8)	3.1

Values in parentheses are the number of individuals that scored in a particular category.

Spring 2012-13 Assessment Rubric and Results for BS Food Science Student Learning Outcome 5 - Evaluate and recommend appropriate laboratory techniques relevant to a particular application or problem.

Student Learning Outcome/Primary Core Competency	Project or Activity Assessed, Date and Evaluator	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Class Score
Graduates will meet the "Undergraduate Education Standards for Degrees in Food Science" Accreditation Requirement of the Institute of Food Technologies as outlined in the 2011 Resource Guide for Approval and Re-Approval of Undergraduate Food Science Programs						
Evaluate and recommend appropriate laboratory techniques relevant to a particular application or problem. / Provide leadership in a variety of situations		Demonstrate a basic understanding of leadership principles	Demonstrate basic leadership qualities	Demonstrate basic leadership qualities specific to complex situations	Demonstrate advanced leadership qualities encountered in complex situations encountered in the food science field	
	FSC 536, Class Exercises & Components of the "CEO Report" Spring 2013	(0)	(0)	(5)	(10)	3.7
	FSC 306, Specific Class Exercises, Fall 2012, Dr. O'Leary	(2)	(0)	(5)	(0)	2.4

Values in parentheses are the number of individuals that scored in a particular category.

2012-2013 Food Science Undergraduate Program Student Learning Outcome Evaluation Report from the University of Kentucky College of Agriculture, Food and Environment (assessment required by the Southern Association of Colleges & Schools). Our program was acknowledged as “Meets Expectations”, which is the highest-ranking possible.



University of Kentucky UAC SLO Evaluation
Bachelor Food Science SLO Report 12-13

Unit: College of Agriculture		
Program: Food Science - Bachelor		
Document Bachelor Food Science SLO Report 12-13		
Meets Expectations		
Meets Expectations	Needs Improvement	Absent
Method(s)		
Relationship between assessment tools and outcomes		
<p>A general explanation is provided about how the assessment tools relates to the outcome measured (e.g., the faculty wrote test items, essay questions, etc to match the outcome, or the instrument was selected “because its general description appeared to match our outcome”). May include pass rates for license or certification exams. Assessment tools specified by a program’s accrediting body are considered to meet expectations, but it must be made clear to the reader that the tool is chosen by the accrediting body. If more than one outcome is linked to any one assessment tool, an explanation is provided for how each outcome can be measured using only one tool.</p> <p>Meets Expectations</p> <p>Comments: General explanation provided. Rubric provided.</p>	<p>At a superficial level, it appears the content assessed by the assessment tools matches the outcome, but no explanation is provided. Assessment tools are primarily indirect, and include things like head counts and course pass rates.</p>	<p>Seemingly no relationship between outcome and assessment tools.</p>
Data collection and Research design integrity		
<p>Enough information is provided to understand the data collection process, such as a description of the sample, evaluation protocol, evaluation conditions, and student motivation, when and where the data was collected (e.g., were students sampled, or was the population evaluated, adequate motivation, two or more trained raters for performance assessment, pre-post design to measure gain, cutoff defended for performance vs. a criterion).</p> <p>Meets Expectations</p> <p>Comments:</p>	<p>Limited information is provided about data collection such as who and how many took the assessment, but not enough to judge the veracity of the process (e.g., thirty-five seniors took the test). There appears to be a mismatch with specifications of desired results.</p>	<p>No information is provided about data collection process or data not collected.</p>
Results		
<p>Results are present, and directly relate to outcomes. If a rubric or grading scale was used, it is clear how many in the sample scored in each category.</p> <p>Meets Expectations</p> <p>Comments:</p>	<p>Results are present, but it is unclear how they relate to the outcomes but presentation lacks clarity or difficult to follow. Only the aggregate totals are given (e.g 80% of the students met the target.)</p>	<p>No results presented.</p>
Interpretation of Results		

<p>Interpretations of results seem to be reasonable inferences given the outcomes, benchmarks/targets, and methodology. The person or persons involved in the analysis are listed.</p> <p>Meets Expectations</p> <p>Comments:</p>	<p>Interpretation attempted, but the interpretation does not refer back to the outcomes or benchmarks/targets for the outcomes. Or, the interpretations are clearly not supported by the methodology and/or results. There is no mention of the person or persons that completed the analysis.</p>	<p>No interpretation attempted. The analysis simply repeats what was stated in the Results category.</p>
Improvement Action		
<p>Examples of improvements (or plans to improve) are documented and directly related to findings of assessment. These improvements are very specific (e.g., approximate dates of and person(s) responsible for implementation, and where in curriculum/activities and department/program they will occur.) If no improvements are found to be necessary then: the program must either increase the benchmark, or explain why the benchmark does not need to be increased; state plans to focus on another area of concern for future assessments and work to monitor and maintain the current level of success for this outcome.</p> <p>Meets Expectations</p> <p>Comments: It may not be necessary to include email communications withing the improvement action plan. A summary of discussions would suffice.</p>	<p>Examples of improvements are documented but the link between them and the assessment findings is not clear. The improvements lack specificity.</p>	<p>No mention of any improvements.</p>
Overall Comments for Reporting Year 2012-2013		
<p>Comments: Communication indicates that assessment is being conducted with Food Science. It may not be necessary to include email communications withing the improvement action plan. A summary of discussions would suffice. Overall, the report would be strengthened with more detailed narrative in the methods and tools section.</p>		

University of Kentucky Undergraduate Food Science Program Summary of Assessment Activates for 2012-2013. This includes documentation of the involvement of our Food Science faculty in each aspect of the assessment process.

July 30, 2012 - UK Undergraduate Food Science Assessment Committee met with Luke Boatright, Greg Rentfrow, Surendranath Suman and Melissa Newman in attendance. This meeting was held to organize the material to be submitted to IFT for our first annual IFT assessment.

August 7, 2012 – The 2012 University of Kentucky Food Science Assessment documents were emailed to Anna Ylijok and Steve Flint; six hard copies were mailed to Ms. Ylijok approximately one week later.

January 29, 2013 - Food Science faculty met to discuss issues relating to assessment of our undergraduate program (for both IFT and UK) and the future direction of our program (i.e., upcoming position openings, administration, etc.). In attendance were Luke Boatright, Gregg Rentfrow, Surendranath Suman, Youling Xiong, Melissa Newman, and Joe O’Leary. The following are the meeting minutes:

1. Assessment –
 - a. Approximately 50% of COA programs need improvement. Only 7 programs meet the expectations on the assessment tools.
 - b. The transition of our graduates after they complete the degree is not considered a student learning outcome (SLO) by the assessment program office.
 - c. Forestry is a program that has done well in the assessment process, and we may use it as a model for FSC.
 - d. Communications skills are a key SLO. We are already doing a lot to improve the communication skills in most FSC courses in the form of lab reports and term papers. All we need to do is document that we are doing this regularly and track the progress of the students across the course. For instance from basic level in FSC 107 to an advanced level in FSC 535. Another way is to evaluate the students in FSC 107 and then the same students later on the capstone course.
2. Getting our students certified for HACCP training at the end of the courses is another way to document the effectiveness of our program.
3. The ability of students to analyze scientific information can be monitored throughout the program. The freshmen should be able to collect scientific information from general databases, whereas the seniors should be able to do it from scientific databases.
4. For most SLO, the baseline can be evaluated in FSC 107. Later courses will measure the performance and progress.
5. Fred Payne is retiring, and BAE is replacing him. Since he is teaching our core course Food Engineering, Foods Group will need to have input on the new hiring process and serve on the search committee.

6. In COA, the enrollment in FSC program is low compared to others. From the new budget model, this might be a problem down the road for the group.
7. New brochures are needed for FSC undergraduate and graduate programs. The current ones are outdated.
8. The prominent role of Meats Lab can be tied to the UK FSIC and thus give proper credit to FSC faculty members involved.

February 14, 2013 – Joe O’Leary and Luke Boatright met to organize and develop test and assignments to be used for assessment of student learning outcomes. Dr. O’Leary’s courses could address the areas of general knowledge, laws and regulations, quality assurance, communications skills and organization skills. Ideally this could begin during the student’s freshman and sophomore years. These would not be implemented all at once, but will provide us with a range to consider.

February 19, 2013 - Meeting was held between Clair Hicks and Luke Boatright to organize/develop the tests/assignments to be used for assessment of student learning outcomes. Dr. Clair Hicks teaches portions of FSC 306 and FSC 430, and the Food Science Capstone course FSC 536. We discussed opportunities in these courses to conduct direct measurements of student learning and how to incorporate these measurements into rubrics that address most of the Food Science undergraduate Student Learning Outcomes.

February 21, 2013 – Dr. Boatright communicated with the Food Science Faculty about the implementation of the Food Science Academic Enrichment Experience. He supplied a draft statement about the implementation and requested any changes or additions, stating that the finalized document would be submitted to the college curriculum committee and noted that if approved, students entering our program beginning Fall 2013 would have to complete this requirement. Based on feedback from Dr. Youling Xiong and Melissa Newman, the document was modified and resubmitted for a vote among the Food Science faculty.

February 2013 Draft of the Academic Enrichment Experience for Food Science Major (Proposed Implementation Process)

The AEE is designed to augment any of the learning objectives specified by the faculty of the Department of Animal and Food Sciences (see appendix 1). For students majoring in FSC, it must be linked in a meaningful way to food sciences. We will accept a variety of student experiences to meet the college-mandated Academic Enrichment Experience. These include (but are not limited to) the following:

- Work experience (e.g., FSC 399)
- Research (e.g., FSC 395)
- Student mentorship
- Study abroad
- Group leadership

- other

In all cases, a student will submit a proposal that includes 1) clearly defined learning objectives and 2) a comprehensive plan for meeting the objectives. This proposal must be reviewed and agreed to (signed) by a mentor and a faculty supervisor. In many cases, the mentor will also be the faculty supervisor. The proposal will be reviewed and accepted/rejected by the DUS for Food Science (or a designated substitute faculty member). After completion of the experience, the student will submit a report that includes the 2 major elements of the original proposal (learning objectives and plan of activity). It will also include a complete description of what was actually done (including specific changes from the original proposal), the student's assessment of his/her accomplishments in meeting the learning objectives, a reflection on what was learned (including unanticipated lessons learned). The mentor will provide an evaluation of student performance and a judgment as to whether or not the student met the agreed-to learning objectives. These will be submitted to the DUS for Food Sciences (or designated substitute) for final disposition. Experiences may involve requirements/activities that occur over several semesters. The student will register for FSC 499 (Academic Enrichment Experience in Food Science; 1 credit hour, P/F grading, a new course) in the semester when the student completes the experience and a grade will be assigned.

Each type of AEE will have specific requirements.

Work Experience (FSC 399): a minimum of 200 h (equivalent to 5 weeks of full time employment). Activities are expected to enhance or extend the learning objectives defined by the Food Sciences program in its learning objectives.

Research (FSC 395): a student is expected to acquire a thorough understanding of the rationale for the research and be the primary person involved in obtaining and analyzing data. The student should be actively involved in the interpretation of the results. The student is expected to write a complete report of the research (e.g., manuscript format) or present the results at a public forum.

Student Mentorship: a student is expected to actively participate in all aspects of instruction, including lesson planning and instruction as well as student and instructor assessment. Students will also receive instruction in pedagogy and instructional ethics.

Study Abroad: open to students participating in any UK sanctioned study abroad program. In cases where the study abroad leader is not from the UK Food Science faculty, the student must develop a specific set of learning objectives with a UK Food Science faculty member and the study leader. The final report should include a comprehensive diary of activities and immediate reflection. Study 'abroad' can include study trips to other states/regions within the United States.

Group/organization leadership: Many of our students gain extraordinary experience in interpersonal relationship skills by serving as leaders in clubs and other student organizations. To qualify as an academic enrichment experience, a student must be an active member of the organization for at least three semesters, culminating in a clearly recognizable position of

leadership in the organization. The student should be able to clearly describe how their responsibility in the organization and their leadership skills developed over the time of their participation. Serving as a club officer (e.g., web master), and then performing minimal duties, will not be considered as sufficient to meet this requirement. Successful completion of the Turner Leadership Academy would meet this requirement.

Other: There are many possible ways a student could complete a valid AEE. We would like to offer students the possibility of developing their own AEEs. For example, a student could organize a community service project (raise funds, solicit donations, recruit volunteers, etc.) related in some way to food sciences.

Appendix 1: Learning Objectives for students majoring in Food Science

1. Students will demonstrate knowledge of scientific principles and the application of those principles to animal and food production systems.
2. Students will formulate and coherently support positions using written, oral, and visual communication skills.
3. Students will recognize and respect diverse viewpoints when deriving solutions to challenges related to animal and food systems.
4. Students will effectively acquire, assimilate, analyze and report scientific information.

Students will demonstrate the ability to work effectively in team environments

March 1, 2013 – Luke Boatright sent out the following detailed notice to all Food Science faculty:

Please send me your records of all assignments and grades from each class that addresses the IFT core competencies. This includes a record of each student (that is enrolled in our Food Science undergraduate program) and the grade they obtained for each assignment. I have attached a list of IFT core competencies that we have already assigned to each class, and these will be used to construct our assessment materials. **I need data for each core competency in each class listed on the attached document, every time it is taught.**

I have also attached an example of a Student Learning Outcome Rubric used for Food Analysis (FSC 535) and that addresses student communication skills. We will need to develop one of these for each class/core competencies (which is not as bad as it sounds). Compiling all this into a assessment report is the time consuming part, so much so that assessment officers are allowed to claim as much as 10 percent on their DOE for this activity. This is probably an accurate estimate of time required during the development stage, and once we get everything organized, it should be less time consuming. But keep in mind that we are going to be expected to document subsequent changes to our classes/program as a result of evaluating these data.

To monitor how students are progressing with “applying critical thinking skills to new situations” (for example) a copy of the related assignment and the grade that each student has obtained should be sent to me within ca. three weeks after the end of each semester. I will then try to compile these into a student learning outcome report that is now required by both the Southern Association of Colleges and Schools (SACS) and IFT. If you have records of assignments and scores for the past three years, please send them to me also, as we are expected to evaluate our students currently enrolled in our capstone course (FSC 536) and determine how they have improved in their core competencies during their course of studies.

I can talk with each of you later to determine where each assignment fits into the “advancement levels” of 1) beginning, 2) developing, 3) accomplished, and 4) exemplary for each core competency.

[<2013_FSC_Assessment Materials.pdf>](#)

March 4, 2013 – Fred Payne notified Luke Boatright that he was working on compiling assessment and grade information.

March 19, 2013 - Meeting with Drs. Surendranath Suman, Luke Boatright, Clair Hicks and Joe O’Leary. We discussed the organization of rubrics for the learning objectives UG Food Science program, and the contribution of each of their courses.

Food Science Group Meeting
Tuesday March 19, 2013 at
401 Garrigus Building

Those present: Luke Boatright
 Surendranath Suman
 Joe O’Leary
 Clair Hicks

1. Academic coordinator position – There is a possibility (nonetheless remote) to have an academic coordinator position for the Food Science program as the one for the Animal Science. This should be helpful in the accreditation and assessment in the future.
2. Using the evaluation and documentation of communication skills and food science skills we should be able to track the progress of the students from FSC 107 to FSC 535. This can be done based on the anticipated proficiency of the students in the respective years when the course is offered. For instance basic level in year 1 to advanced level in year 4.
3. The scores for each skill can be represented as the average for the class based on the average of the points from the student population in the class. This should provide a picture of the performance of the class as whole.

March 19, 2013 - Meeting between Luke Boatright and Melissa Newman to discuss the organization of a rubric for the learning objectives of the undergraduate Food Science program, and the contribution of her courses (FSC 530 and FSC 538). With an emphasis on understanding and applying government regulations and quality assurance issues.

March 30, 2013 - Material submitted from Dr. Suman regarding assessment of “Applied Food Science” core competencies from Animal Derived Foods (FSC 304) and Sensory Evaluation (FSC 430):

Spring 2011-12 Assessment Rubric and Results for BS Food Science Student Learning Outcome 1 - Food Science Knowledge (Applied Food Science)

Student Learning Outcome/Objective	Project or Activity Assessed, Date and Evaluator	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Score
Graduates will meet the "Undergraduate Education Standards for Degrees in Food Science" Accreditation Requirement of the Institute of Food Technologies as outlined in the 2011 Resource Guide for Approval and Re-Approval of Undergraduate Food Science Programs						2.58
Demonstrate the use and practice of a fundamental knowledge of food science (i.e., chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development	FSC 304-Animal Derived Foods, Dr. Suman. Individual exam questions with a focus on the subject area - Spring 2012	See attached rubric for definition	See attached rubric for definition	See attached rubric for definition	See attached rubric for definition	

RUBRICS FOR EVALUATION

UK Food Science program IFT Core Competencies – FSC 304 and FSC 430 (Surenranath Suman's courses in 2012)
Food Science Option – 1; Applied Food Science

	Beginning = 1	Developing = 2	Accomplished = 3	Exemplary = 4
Be able to apply and incorporate the principles of Food Science in practical, real-world situations and problems	Demonstrate understanding of the applications of principles in food processing	Can apply the principles in basic operations encountered in food industry	Can apply the principles in complex situations encountered in food industry	Can apply the principles in complex situations (specific to different types of product) encountered in food industry
Be able to apply the principles of Food Science to control and assure the quality of food products	Demonstrate understanding of the applications of principles in quality control	Can apply the principles in basic operations encountered in quality control	Can apply the principles in complex situations encountered in quality control	Can apply the principles in complex situations (specific to different types of product) encountered in quality control
Understand the basic principles of sensory analysis	Demonstrate understanding of basic principles of sensory analysis	Can apply the principles of sensory analysis in basic operations encountered in food product development	Can apply the principles of sensory analysis in complex situations encountered in food product development	Can apply the principles of sensory analysis in complex situations (specific to different types of product) encountered in food product development
Be aware of current topics of importance to the food industry	Demonstrate understanding of the current topics of importance in general food industry	Demonstrate understanding of current topics of importance, specific to a variety of products, in food industry	Demonstrate understanding current topics of importance, specific to complex situations encountered and operations, in food industry	Demonstrate understanding of current topics of importance specific to food products, processing strategies, retailing, and trade
Understand government regulations required for the manufacture and sale of food products	Demonstrate understanding of the common government regulations in general food industry	Demonstrate understanding of the government regulations, specific to a variety of products, in food industry	Demonstrate understanding of the government regulations, specific to complex situations encountered, in food industry	Demonstrate understanding of the government regulations specific to food products, processing strategies, retailing, and trade

Spring 2012-13 Assessment Rubric and Results for BS Food Science Student Learning Outcome 1 - Food Science Knowledge (Applied Food Science)

Student Learning Outcome/Objective	Project or Activity Assessed, Date and Evaluator	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Score
Graduates will meet the "Undergraduate Education Standards for Degrees in Food Science" Accreditation Requirement of the Institute of Food Technologies as outlined in the 2011 Resource Guide for Approval and Re-Approval of Undergraduate Food Science Programs						3.32
Demonstrate the use and practice of a fundamental knowledge of food science (i.e., chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development	FSC 430-Sensory Evaluation, Dr. Suman. Individual exam questions with a focus on the subject area - Fall 2012	See attached rubric for definition	See attached rubric for definition	See attached rubric for definition	See attached rubric for definition	

RUBRICS FOR EVALUATION

UK Food Science program IFT Core Competencies – FSC 304 and FSC 430 (Surendranath Suman's courses in 2012)
Food Science Option – 1; Applied Food Science

	Beginning = 1	Developing = 2	Accomplished = 3	Exemplary = 4
Be able to apply and incorporate the principles of Food Science in practical, real-world situations and problems	Demonstrate understanding of the applications of principles in food processing	Can apply the principles in basic operations encountered in food industry	Can apply the principles in complex situations encountered in food industry	Can apply the principles in complex situations (specific to different types of product) encountered in food industry
Be able to apply the principles of Food Science to control and assure the quality of food products	Demonstrate understanding of the applications of principles in quality control	Can apply the principles in basic operations encountered in quality control	Can apply the principles in complex situations encountered in quality control	Can apply the principles in complex situations (specific to different types of product) encountered in quality control
Understand the basic principles of sensory analysis	Demonstrate understanding of basic principles of sensory analysis	Can apply the principles of sensory analysis in basic operations encountered in food product development	Can apply the principles of sensory analysis in complex situations encountered in food product development	Can apply the principles of sensory analysis in complex situations (specific to different types of product) encountered in food product development
Be aware of current topics of importance to the food industry	Demonstrate understanding of the current topics of importance in general food industry	Demonstrate understanding of current topics of importance, specific to a variety of products, in food industry	Demonstrate understanding current topics of importance, specific to complex situations encountered and operations, in food industry	Demonstrate understanding of current topics of importance specific to food products, processing strategies, retailing, and trade
Understand government regulations required for the manufacture and sale of food products	Demonstrate understanding of the common government regulations in general food industry	Demonstrate understanding of the government regulations, specific to a variety of products, in food industry	Demonstrate understanding of the government regulations, specific to complex situations encountered, in food industry	Demonstrate understanding of the government regulations specific to food products, processing strategies, retailing, and trade

May 29, 2013 – Luke Boatright sent a reminder to the Food Science faculty who had not yet complied with his earlier request for assessment data to be submitted to him.

June 17, 2013 – Fred Payne submitted materials for BAE 340 for Fall, 2012.

June 18, 2013 - Luke Boatright suggested to Fred Payne that they meet and work out how to convert grades from select assignments into assessment material.

June 18, 2013 – Luke Boatright sent a generic rubric for “Applied Food Science Skills” to Joe O’Leary with additional notes on completion.

June 20, 2013 – Dr. Boatright sent a generic rubric to Fred Payne to use for his evaluations, highlighting the text in red that should be altered to fit with Payne’s class core competency areas.

June 20, 2013 - Luke Boatright, Fred Payne and two engineering graduate students met to discuss the process of evaluation of the IFT core competencies that apply to Food Engineering, the development of the appropriate rubric and using the evaluations to improve student learning in the future.

July 18, 2013 - Dr. Joe O’Leary provided the 2012-2013 assessment results from the Introduction to Food Sciences (FSC 107) and Introduction to Food Processing (FSC 306).

July 19, 2013 - The entire Food Science faculty (except Dr. Rentfrow) met to discuss future direction and needs with regards to hiring a new faculty when Dr. O’Leary retires. This will have a significant impact on our undergraduate program because of the teaching enrollment of Dr. O’Leary. At the end of the meeting there was a follow-up meeting between Drs. Boatright, Henning and Xiong to discuss the need for assessment material input from Dr. Henning and Xiong.

July 24, 2013 – A follow-up email was sent by Dr. Boatright to Dr. O’Leary requesting copies of the rubrics used for each item assessed.

July 30, 2013 – Luke Boatright sent Dr. Youling Xiong a brief explanation of a portion of our undergraduate assessment process and the IFT learning outcomes for Food Chemistry. For each core competency covered in a class we need to develop a rubric (a 4-point scale to use as an evaluation tool). An example was provided. These should be coordinated with regard to the "level of difficulty" among all the classes in the program that address the same core competency. When combined one would expect to see that our students are learning as they go through the program. The assessment professionals that review our work consider this a direct measurement of learning.

So, for example under "Applied Food Science" the core competency "be able to apply the

principles of food science to control and assure the quality of food products" is covered in several classes across our bachelor's program. First we develop a rubric for that SLO. The following is the series that Surendranath developed for that SLO:

Be able to apply the principles of Food Science to control and assure the quality of food products	Demonstrate understanding of the applications of principles in quality control	Can apply the principles in basic operations encountered in quality control	Can apply the principles in complex situations encountered in quality control	Can apply the principles in complex situations (specific to different types of product) encountered in quality control
	Score (1)	(2)	(3)	(4)

The following IFT learning outcomes for food chemistry are (in my opinion) the most generalized of all the IFT learning outcomes.

Table 1. Core Competencies in Food Science

Core competency	Content	By the completion of food science program, the student should:
Food Chemistry and analysis	Structure and properties of food components, including water, carbohydrates, protein, lipids, other nutrients and food additives Chemistry of changes occurring during processing, storage and utilization	<ul style="list-style-type: none"> • Know the chemistry underlying the properties and reactions of various food components • Have sufficient knowledge of food chemistry to control reactions in foods. • Know the major chemical reactions that limit shelf life of foods.

In my opinion each of these learning outcomes listed (in the third column) are covered, to some degree, by almost every question on each exam, quiz etc. in Food Chemistry. Thus, trying to select a few exam questions, or segments of assignments or project to address these learning outcomes is problematic. One could almost simply use the exam grades in their entirety, which is a "direct measurement of learning", but assessment professionals deem this unacceptable.

2012-2013 Primary Program Modifications resulting from Assessment:

1. Implementation of the Academic Enrichment Experience (AEE) into the Food Science program requirements

Justification for implementation of the AEE program in the Food Science undergraduate program:

At various times over the 2012-2013 academic year, meetings were held among the food science assessment committee and other faculty. Based on evaluations of our 2012-2013 assessment activities (as shown above) additional activities relating to SLO's under Success Skills and Applied Food Science (and corresponding documentation) should be incorporated into our program. Additional documentation of this process both within the Food Science program and across other curriculums in the UK College of Agriculture, Food and Environment are provided below.

In order that each undergraduate who completes a food science undergraduate degree will have their own significant academic enrichment experience, beginning in the Fall of 2013 all incoming freshmen will be required to complete an AEE requirement. The following described this requirement:

Academic Enrichment Experience: Food Science Major

Proposed Implementation Process

The AEE is designed to augment any of the learning objectives specified by the faculty of the Department of Animal and Food Sciences (see appendix 1). For students majoring in FSC, it must be linked in a meaningful way to food sciences. We will accept a variety of student experiences to meet the college-mandated Academic Enrichment Experience. These include (but are not limited to) the following:

- Work experience (e.g., FSC 399)
- Research (e.g., FSC 395)
- Student mentorship
- Study abroad
- Group leadership
- other

In all cases, a student will submit a proposal that includes 1) clearly defined learning objectives and 2) a comprehensive plan for meeting the objectives. This proposal must be reviewed and agreed to (signed) by a mentor and a faculty supervisor. In many

cases, the mentor will also be the faculty supervisor. The proposal will be reviewed and accepted/rejected by the DUS for Food Science (or a designated substitute faculty member). After completion of the experience, the student will submit a report that includes the 2 major elements of the original proposal (learning objectives and plan of activity). It will also include a complete description of what was actually done (including specific changes from the original proposal), the student's assessment of his/her accomplishments in meeting the learning objectives, a reflection on what was learned (including unanticipated lessons learned). The mentor will provide an evaluation of student performance and a judgment as to whether or not the student met the agreed-to learning objectives. These will be submitted to the DUS for Food Sciences (or designated substitute) for final disposition. Experiences may involve requirements/activities that occur over several semesters. The student will register for FSC 499 (Academic Enrichment Experience in Food Science; 1 credit hour, P/F grading, a new course) in the semester when the student completes the experience and a grade will be assigned.

Each type of AEE will have specific requirements.

Work Experience (FSC 399): a minimum of 200 h (equivalent to 5 weeks of full time employment). Activities are expected to enhance or extend the learning objectives defined by the Food Sciences program in its learning objectives (see appendix 1).

Research (FSC 395): a student is expected to acquire a thorough understanding of the rationale for the research and be the primary person involved in obtaining and analyzing data. The student should be actively involved in the interpretation of the results. The student is expected to write a complete report of the research (e.g., manuscript format) or present the results at a public forum.

Student Mentorship: a student is expected to actively participate in all aspects of instruction, including lesson planning and instruction as well as student and instructor assessment. Students will also receive instruction in pedagogy and instructional ethics.

Study Abroad: open to students participating in any UK sanctioned study abroad program. In cases where the study abroad leader is not from the UK Food Science faculty, the student must develop a specific set of learning objectives with a UK Food Science faculty member and the study leader. The final report should include a comprehensive diary of activities and immediate reflection. Study 'abroad' can include study trips to other states/regions within the United States.

Group/organization leadership: Many of our students gain extraordinary experience in interpersonal relationship skills by serving as leaders in clubs and other student organizations. To qualify as an academic enrichment experience, a student must be an active member of the organization for at least three semesters, culminating in a clearly recognizable position of leadership in the organization. The student should be able to

clearly describe how their responsibility in the organization and their leadership skills developed over the time of their participation. Serving as a club officer (e.g., web master), and then performing minimal duties, will not be considered as sufficient to meet this requirement. Successful completion of the Turner Leadership Academy would meet this requirement.

Other: As mentioned at the outset, there are many possible ways a student could complete a valid AEE. We would like to offer students the possibility of developing their own AEEs. For example, a student could organize a community service project (raise funds, solicit donations, recruit volunteers, etc.) related in some way to food sciences.

Learning Objectives for students majoring in Food Science

- Students will demonstrate knowledge of scientific principles and the application of those principles to animal and food production systems.
- Students will formulate and coherently support positions using written, oral, and visual communication skills.
- Students will recognize and respect diverse viewpoints when deriving solutions to challenges related to animal and food systems.
- Students will effectively acquire, assimilate, analyze and report scientific information.
- Students will demonstrate the ability to work effectively in team environments

Completing the Food Science Academic Enrichment Experience (AEE) is now a required component of the undergraduate Food Science degree and is indicated as such in the 2013 program description.

2. **Improvements/modifications to the Food Science Internship Program including a new Student Learning Contract and online internship evaluation form for employers to evaluate the student workers.** See **Appendix 2** for examples including sample student learning contract of internships, sample e-mail requesting employer evaluation of a student and an example of an employer evaluation.

3. **Specific changes to the curriculum map include (see Appendix 3):**
 - a. Inclusion of a new math series option with a focus on statistics (MA 137 & 162).
 - b. Based on the need for further direct measures of leadership activities in our program we have included a revised curriculum, which includes Leadership Studies (CLD 230) under specialty support.

2013-2014 Curriculum Assessment Cycle

Food Science Student Learning Outcomes Evaluated:

- #6 Be able to select, evaluate, and convey scientific information to individuals or groups at various educational levels.

- #2 Apply quality assurance procedures in food processing such as Hazard Analysis and Critical Control Points (HACCP) toward the production of safe and nutritious foods.

- #1 Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development.

Assessment Tools, Procedures and Evaluations:

- **2013-14 Assessment Rubric and Results for BS Food Science Student Learning Success Skills #6 - Be able to select, evaluate, and convey scientific information to individuals or groups at various educational levels.**

Student Learning Outcome/Primary Core Competency	Project or Activity Assessed, Date and Evaluator	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Mean Assessment Value
Graduates will meet the "Undergraduate Education Standards for Degrees in Food Science" Accreditation Requirement of the Institute of Food Technologies as outlined in the 2011 Resource Guide for Approval and Re-Approval of Undergraduate Food Science Programs						
Be able to select, evaluate, and convey scientific information to individuals or groups at various educational levels. / Demonstrate the use and practice of different levels of oral and written communication skills. This includes such skills as writing technical reports, letters and memos; communicating technical information to a non-technical audience; and making formal and informal presentations.		The writing sample fails to demonstrate competency in basic writing. The writing sample evidences recurring problems with respect to the generation or organization of content and/or conformity to professional and academic conventions for language usage.	The writing sample is uneven or undeveloped in its attempts to generate and organize appropriate content. The use of language does not consistently conform to the conventions of professional and academic communities.	The writing sample demonstrates a solid ability to generate detailed content appropriate to the purpose as well as the ability to organize and support it. It uses language and formatting that conform to the expectations of professional and academic communities.	The writing sample demonstrates a particularly effective ability to generate detailed content appropriate to the purpose as well as the ability to organize and support it in an effective manner. It uses clear and coherent language and formatting that conform to the expectations of professional and academic communities.	
	FSC 536, Components of the "CEO Report" Spring 2014 Dr. Clair Hicks	(0)	(2)	(2)	(1)	3.3
	FSC 535, Designated lab reports, Fall 2013, Dr. Boatright*	(0)	(3)	(1)	(1)	3.3
	FSC 306, Specific Exam Segments of lab reports and writing assignments, Fall 2012, Dr. O'Leary	(2)	(1)	(4)	(0)	2.3

Values in parentheses are the number of individuals that scored in a particular category.

*Detailed writing samples available on request

- 2013-14 Assessment Rubric and Results for BS Food Science Student Learning Outcome #1** - Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development. Be able to apply the principles of Food Science to the control and assure the quality of products.

Student Learning Outcome/Objective	Project or Activity Assessed, Date and Evaluator	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Mean Assessment Value
Graduates will meet the "Undergraduate Education Standards for Degrees in Food Science" Accreditation Requirement of the Institute of Food Technologies as outlined in the 2011 Resource Guide for Approval and Re-Approval of Undergraduate Food Science Programs						
Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development. / Be able to apply the principles of Food Science to the control and assure the quality of products		Demonstrate understanding of the applications of principles in quality control	Can apply the principles in basic operations encountered in quality control	Can apply the principles in complex situations encountered in quality control	Can apply the principles in complex situations (specific to different types of product) encountered in quality control	
	FSC 304, Components of Lab Reports, Exams and Reports on Field Trips Spring 2014 Dr. Surendranath Suman	(2)	(6)	(3)	(0)	2.2
	FSC 430, Components of Lab Reports, Exams and Reports on Field Trips, Fall 2012 Dr. Surendranath Suman	(0)	(2)	(10)	(8)	3.3
	FSC 304, Components of Lab Reports, Exams and Reports on Field Trips Spring 2012 Dr. Surendranath Suman	(0)	(2)	(2)	(0)	2.5

Values in parentheses are the number of individuals that scored in a particular category.
FSC 304 was not taught in 2013 due to not enough students

2013-14 Assessment Rubric and Results for BS Food Science Student Learning Outcome #1 – Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development. Understanding the basic principles of sensory analysis

Student Learning Outcome/Primary Core Competency	Project or Activity Assessed, Date and Evaluator	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Mean Assessment Value
Graduates will meet the "Undergraduate Education Standards for Degrees in Food Science" Accreditation Requirement of the Institute of Food Technologies as outlined in the 2011 Resource Guide for Approval and Re-Approval of Undergraduate Food Science Programs						
Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development. / Understand the basic principles of sensory analysis		Demonstrate understanding of basic principles of sensory analysis	Can apply the principles of sensory analysis in basic operations encountered in food product development	Can apply the principles of sensory analysis in complex situations encountered in food product development	Can apply the principles of sensory analysis in complex situations (specific to different types of product) encountered in food product development	
	FSC 304, Components of Lab Reports, Exams and Reports on Field Trips Spring 2014 Dr. Surendranath Suman	(2)	(6)	(3)	(0)	2.2
	FSC 430, Components of Lab Reports, Exams and Reports on Field Trips, Fall 2012 Dr. Surendranath Suman	(0)	(2)	(10)	(8)	3.3
	FSC 304, Components of Lab Reports, Exams and Reports on Field Trips Spring 2012 Dr. Surendranath Suman	(0)	(2)	(2)	(0)	2.5

Values in parentheses are the number of individuals that scored in a particular category.

FSC 304 was not taught in 2013 due to not enough students

University of Kentucky Undergraduate Food Science Program Summary of Assessment Activities 2013-2014

On July 19, 2013, the entire Food Science faculty (except Dr. Rentfrow) met to discuss future direction and needs with regards to hiring a new faculty when Dr. O’Leary retires. This will have a significant impact on our undergraduate program because of the teaching enrolment of Dr. O’Leary. Additional discussion included future needs for assessment inputs.

December 30, 2013 – We were informed that the Food Science assessment activities for 2012-2013 were evaluated as “Meets Expectations” which is the highest-ranking possible. The following is the UK program assessment report.

On January 22, 2014 Food Science Faculty including Luke Boatright, Melissa Newman, Clair Hicks, Joe O’Leary, Greg Rentfrow and Bernie Henning meet. Item discussed relating to the assessment and maintaining the quality of our undergraduate food science program included the just received IFT HERB evaluation (dated January 8, 2014). Dr. Boatright informed the group that many of the items mentioned in this letter were already being addressed and that our 2013-14 evaluations will be a topic for future meetings. We also discussed the hiring or two positions of critical importance to the quality of our undergraduate program. First was an extension faculty position with a 25 percent teaching and 75 percent extension appointment (the O’Leary position). The other was a Food Science Innovation Center/undergraduate program coordinator.

The following is a summary of Food Science Assessment activities/meetings associated with the implementation of a “Graduation Composition and Communication Requirements” (GCCR)

English composition and Communication assignments/assessment have occurred in various Food Science classes for decades. However, in order to better evaluate the quality of our student’s composition and communication skills the University Food Science program began implementation of a new GCCR.

November 22, 2013, Correspondences between the College of Agriculture, Food, and the Environment’s Associate Dean of Instruction (Dr. Larry Grabau), the Director of Undergraduate Studies of the Food Science Program (Dr. Clair Hicks) and the Food Science Assessment Officer (Dr. Luke Boatright) regarding the description and implementation of the a revised GCCR for the Food Science undergraduate program. The GCCR will address the Food Science program-level Student Learning Outcome Number 6, “Demonstrate communication, computer and information technology skills necessary to obtain, analyze, interpret and convey scientific information to individuals or groups at various educational levels.” The new GCCR will also vertically integrate with of the University of Kentucky’s second “UKCore” learning outcome (that is, students will demonstrate competent written, oral, and visual communication skills both as producers and consumers of information) into the Food Science program.

The primary GCCR requirements include:

- one or more written assignments in English (the language) that total to at least 4,500 words (the equivalent of 15 pages of double-spaced, typewritten text);
- either an oral assignment, in which students must give a presentation at least 10 minutes long
- an assignment that requires the student to demonstrate information literacy in the discipline;
- the incorporation of a draft/feedback/revision process on GCCR assignments;
- to satisfy the GCCR, students must earn an average grade of C or better on the designated Composition and Communication intensive assignments produced in any given course designated as fulfilling some or all of the GCCR.

February 21, 2014 the UK Food Science Assessment Committee and Food Science faculty (comprised of Luke Boatright, Clair Hicks, Melissa Newman and Surendranath Suman) met and discussed the GCCR requirements and the possibility of incorporating these requirements into existing Food Science courses assignments. To consider the plausibility of this further, we composed a draft GCCR form and attached draft Food Science course syllabi (**see Appendix 3**) that incorporated the GCCR assignments/requirements (included below).

**Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM**

I. General Information:

College:	<u>Agriculture, Food and Environment</u>	Department (Full name):	<u>Animal & Food Sciences</u>
Major Name (full name please):	<u>Food Science</u>	Degree Title:	<u>B.S. in Food Science</u>
Formal Option(s), if any:	_____	Specialty Field w/in Formal Options, if any:	_____
Requested Effective Date:	<u>FALL 2014, IF RECEIVED BY SENATE COUNCIL BY MONDAY, APRIL 7.</u>		
Contact Person:	<u>Luke Boatright</u>	Phone:	<u>257-5988</u>
		Email:	<u>luke.boatright@uky.edu</u>

II. Parameters of the Graduation Composition and Communication Requirement (GCCR):

The new GCCR replaces the old Graduation Writing Requirement. It is fulfilled by a course or courses specified within a B.A./B.S. degree program. As outlined in draft Senate Rule 5.4.3.1, the GCCR stipulates that students must successfully complete this requirement after achieving sophomore status and prior to graduation. To satisfy the GCCR, students must earn an average grade of C or better on the designated Composition and Communication (C&C) intensive assignments produced in any given course designated as fulfilling some or all of the GCCR. The requirements for GCCR courses include:

- at least 4500 words of English composition (approximately 15 pages total);
- a formal oral assignment or a visual assignment;
- an assignment demonstrating information literacy in the discipline;
- a draft/feedback/revision process on GCCR assignments.

The program requirements for the GCCR include:

- at least one specific Program Student Learning Outcome for C&C outcomes;
- a plan for assessing both the writing and oral or visual components of the GCCR;
- clear goals, rubrics, and revision plans for GCCR implementation.

Upon GCCR approval, each program will have a version of the following specification listed with its Program Description in the University Bulletin:

"Graduation Composition and Communication Requirement. Students must complete the Graduation Composition and Communication Requirement as designated for this program. Please consult a college advisor or program advisor for details. See also 'Graduation Composition and Communication Requirement' on p. XX of this Bulletin."

III. GCCR Information for this Program (by requirement):

A. List the courses currently used to fulfill the old Graduation Writing Requirement:
<u>WRD 203 Business Writing</u>
B. GCCR Program Outcomes and brief description:
1. Please specify the Major/Program Student Learning Outcomes (SLOs) pertaining to Composition & Communication and the GCCR requirement. These are <i>program</i> outcomes, not <i>course</i> outcomes. Please specify the program-level SLOs for C&C in your program: <u>Demonstrate communication, computer and information technology skills necessary to obtain, analyze, interpret and convey scientific information to individuals or groups at various educational levels.</u>
2. Please provide a short GCCR description for your majors (limit 1000 characters): Please explain the GCCR requirement in language appropriate for undergraduate majors to understand the specific parameters and justification of your program's GCCR implementation plan: <u>The components that fulfill the Graduation Communication and Composition Requirement (GCCR) within the University of Kentucky's Food Science program are designed to provide students with the opportunity to demonstrate the ability to organize and present content relevant to the Food Science field in an effective and coherent manner.</u>

version 01/29/14

**Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM**

C. Delivery and Content:	
<p>1. Delivery specification: for your major/program, how will the GCCR be delivered? Please put an X next to the appropriate option. (Note: it is strongly recommended that GCCR courses be housed within the degree program.)</p>	<input type="checkbox"/> a. Single required course within program <input checked="" type="checkbox"/> b. multiple required or optional courses within program <input type="checkbox"/> c. course or courses outside program (i.e., in another program) <input type="checkbox"/> d. combination of courses inside and outside program <input type="checkbox"/> e. other (please specify): _
<p>2. Basic Course Information: Please provide the following information for course(s) used to satisfy the GCCR, either in whole or in part:</p>	
<p>Course #1: Dept. prefix, number, and course title: <u>Animal & Food Sciences, FSC 430-Sensory Evaluation</u></p>	
<ul style="list-style-type: none"> • new or existing course? <u>existing</u> (new courses should be accompanied by a New Course Proposal) <ul style="list-style-type: none"> ○ <input type="checkbox"/> if a new course, check here that a New Course Proposal has been submitted for review via eCATS • required or optional? <u>required</u> • shared or cross-listed course? <u>no</u> • projected enrollment per semester: <u>12</u> 	
<p>Course #2 (if applicable): Dept. prefix, number, and course title: <u>Animal & Food Sciences, FSC 530-Food Microbiology</u></p>	
<ul style="list-style-type: none"> • new or existing course? <u>existing</u> (new courses should be accompanied by a New Course Proposal) <ul style="list-style-type: none"> ○ <input type="checkbox"/> if a new course, check here that a New Course Proposal has been submitted for review via eCATS • required or optional? <u>required</u> • shared or cross-listed course? <u>no</u> • projected enrollment per semester: <u>30</u> 	
<p>Course #3 (if applicable): Dept. prefix, number, and course title: <u>Animal & Food Sciences FSC 536-Advanced Food Technology</u></p>	
<ul style="list-style-type: none"> • new or existing course? <u>existing</u> (new courses should be accompanied by a New Course Proposal) <ul style="list-style-type: none"> ○ <input type="checkbox"/> if a new course, check here that a New Course Proposal has been submitted for review via eCATS • required or optional? <u>required</u> • shared or cross-listed course? <u>no</u> • projected enrollment per semester: <u>12</u> 	
<p>3. Shared courses: If the GCCR course(s) is/are shared from <i>outside</i> the program, please specify the related department or program that will be delivering the course(s). Please provide the following:</p>	
<ul style="list-style-type: none"> • Contact information of providing program: _____ • Resources: what are the resource implications for the proposed GCCR course(s), including any projected budget or staffing needs? If multiple units/programs will collaborate in offering the GCCR course(s), please specify the resource contribution of each participating program. _____ • Memorandum of Understanding/Letter of Agreement: Attach formal documentation of agreement between the providing and receiving programs, specifying the delivery mechanisms and resources allocated for the specified GCCR course(s) in the respective programs (include with attachments). Date of agreement: _____ 	
<p>4. Syllabi: Please provide a sample syllabus for each course that will be designated to fulfill the GCCR. Make sure the following things are clearly indicated on the syllabi for ease of review and approval (check off each):</p> <ul style="list-style-type: none"> • the GCCR assignments are highlighted in the syllabus and course calendar; • the GCCR assignments meet the minimum workload requirements as specified by the Senate Rules for GCCR courses (see the draft Senate GCCR rule linked here); • the elements are specified in the syllabus that fulfill the GCCR requirement for a clear draft/feedback/revision process; • the grade level requirements for the GCCR are specified on the syllabus (i.e., an average of C or better is required on GCCR assignments for credit); • the course or sequence of courses are specified to be completed after the first year (i.e. to be completed after completing 30 credit hours) for GCCR credit; 	

version 01/29/14

**Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM**

<ul style="list-style-type: none"> • the course syllabus specifies “This course provides full/partial GCCR credit for the XXX major/program” <ul style="list-style-type: none"> ○ if the course provides partial GCCR credit, the fulfilled portion of the GCCR must be specified and the other components of the GCCR for the program must be specified: e.g. “This course provides partial credit for the written component of the GCCR for the XXX major/program in conjunction with Course 2”
<p>5. Instructional plan: Summarize the instructional plan for teaching the C&C skills specified in the program SLOs and delivered in the course(s). Include the following information in brief statements (1000 characters or less). Information can be cut-and-pasted from the relevant sample syllabus with indications where on the syllabus it is found:</p>
<ul style="list-style-type: none"> • overview of delivery model: summarize how the GCCR will be delivered for all program majors: explain how the delivery model is appropriate for the major/program and how it is offered at an appropriate level (e.g. required course(s), capstone course, skills practicum sequence of courses, etc.): <u>The GCCR will be conducted as part of the existing Food Science courses (FSC 430, FSC 530 & FSC 536). These are all required courses typically offered to juniors and seniors in the program. Each will be conducted as an assignment appropriate for Food Science major as relevant components of each course.</u>
<ul style="list-style-type: none"> • assignments: overview or list of the assignments to be required for the GCCR (e.g. papers, reports, presentations, videos, etc.), with a summary of how these GCCR assignments appropriately meet the disciplinary and professional expectations of the major/program: <u>Written assignments in FSC 430, FSC 530 and FSC 536 and an oral assignment as part of FSC 399 or FSC 395 (which is our "Academic Enrichment Experiment" requirement).</u>
<ul style="list-style-type: none"> • revision: description of the draft/feedback/revision plan for the GCCR assignments (e.g. peer review with instructor grading & feedback; essay drafting with mandatory revision; peer presentations; etc.): <u>Written assignments will be subjected to a draft, feedback and revision process between the student and professor if a grade of "D" or lower is obtained on any GCCR assignment .</u>
<ul style="list-style-type: none"> • other information helpful for reviewing the proposal: _____
<p>D. Assessment:</p>
<p>In addition to providing the relevant program-level SLOs under III.B, please specify the assessment plan at the program level for the proposed course(s) and content. Provide the following:</p>
<ul style="list-style-type: none"> • specify the assessment schedule (e.g., every 3 semesters; biennially): <u>The Food Science SLO that includes the GCCR will be assessed every two years</u>
<ul style="list-style-type: none"> • identify the internal assessment authority (e.g. curriculum committee, Undergraduate Studies Committee): <u>Food Science Assessment Committee</u>
<ul style="list-style-type: none"> • if the GCCR course(s) is/are shared, specify the assessment relationship between the providing and receiving programs: explain how the assessment standards of the receiving program will be implemented for the provided course(s): <u>n/a</u>

version 01/29/14

**Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM**

Signature Routing Log

General Information:

GCCR Proposal Name (course prefix & number, program major & degree):	Food Science GCCR
Contact Person Name:	Luke Boatright
Phone:	7-5988
Email:	luke.boatright@uky.edu

Instructions:

Identify the groups or individuals reviewing the proposal; record the date of review; provide a contact person for each entry. On the approval process, please note:

- Proposals approved by Programs and Colleges will proceed to the GCCR Advisory Committee for expedited review and approval, and then they will be sent directly to the Senate Council Office. Program Changes will then be posted on a web transmittal for final Senate approval in time for inclusion in the Fall 2014 Course Bulletin.
- New Course Proposals for the GCCR will still require review and approval by the Undergraduate Council. This review will run parallel to GCCR Program Change review.
- In cases where new GCCR courses will be under review for implementation after Fall 2014, related GCCR Program Changes can still be approved for Fall 2014 as noted "pending approval of appropriate GCCR courses."

Internal College Reviews and Course Sharing and Cross-listing Reviews:

Reviewing Group	Date Reviewed	Contact Person (name/phone/email)
Home Program <i>review by Chair or DUS, etc.</i>	3-13-14	Clair Hicks, Food Science DUS / 7-7537/ clhicks@uky.edu
Providing Program <i>(if different from Home Program)</i>		/ /
Cross-listing Program <i>(if applicable)</i>		/ /
College Dean		/ /
		/ /

Administrative Reviews:

Reviewing Group	Date Approved	Approval of Revision/ Pending Approval ¹
GCCR Advisory Committee		

Comments:

¹ Use this space to indicate approval of revisions made subsequent to that group's review, if deemed necessary by the revising group; and/or any Program Change approvals with GCCR course approvals pending.

After the Food Science Assessment Committee reviewed the process and potential effects of incorporating these GCCR requirements into our existing Food Science course assignments, serious questions were raised about the wisdom of having the upper-tier English composition and communication requirement replaced by writing requirements within existing Food Science classes (and taught by professors that had not been specifically trained to teach English grammar and sentence structure). The following sequences of meetings and correspondences demonstrate the degree that this issue was seriously considered and the extent that our Food Science faculty, faculty from the English department and our administrators were involved.

On March 10, 2014 Dr. Luke Boatright contacted to Dr. Larry Grabau (the College of Agriculture, Food and Environment Associate Dean of Instruction) to express the Food Science programs concerned about the new GCCR requirements.

On March 11, 2014 the Food Science faculty were informed that our faculty could receive outside training that addresses GCCR instruction, and that there are multiple models for programs (like Food Science) to satisfy the GCCR:

- By developing a new course within the program (Dietetics and Agricultural Economics are following this model)
- By modifying existing course(s) within the program (Agricultural Biotechnology, Human Nutrition, and many other CAFE programs are going this way)
- By out-sourcing this instruction to other colleges or other departments **within** CAFE (Family Sciences is working on this premise).

During subsequent meetings of the Food Science Assessment Committee (ca. **March 12-April 1, 2014**) we determined that our concerns about moving the UK second tier writing requirement from the UK English department into existing courses within the CAFÉ had insufficiently addressed the concerns outlined by the Food Science faculty on March 11th. At this point we began to pursue a course of action that maintained the specific GCCR requirements, but that would fulfill the requirements as part of a revised upper tier writing course (WRD 203) to be taught in the University of Kentucky's Writing, Rhetoric and Digital Studies (English) department.

After discussions with faculty in the University of Kentucky's Department of Biosystems and Agricultural Engineering (BAE), we discussed information, and received examples of how the GCCR could be incorporated into an existing upper-tier writing course in the WRD department (**April 1, 2014**):

Based on the meetings that occurred on April 1, 2014 between the UK WRD faculty representatives, the UK Department of Biosystems and Agricultural Engineering we were provided with examples of the types of memorandum of agreements (MOA) and GCCR forms needed. Based on these agreements, Civil, Mechanical and BAE will be utilizing WRD 204 to

fulfill the GCCR requirement. If other programs decided to go that way, then an equivalent MOA must be signed between that program and the WRD department.

On Friday, April 11, 2014 the Food Science Undergraduate Assessment Committee contacted the UK WRD department and informed them that we would like to use WRD 203, business writing for our GCCR requirement. Also, we noted that we want to follow the same format that Dr. Crofcheck did for WRD 204 (see below). Our program would average about 10 students per year. We currently require WRD 203 as the second-tier writing requirement for our undergraduate Food Science program, and would like to continue using WRD 203 to satisfy the GCCR requirement now and in the future.

We received a response from Brian McNely of the UK WRD department who informed us that because we were looking at using 203 rather than 204, we should be talking with Deborah Kirkman, Associate Director of WRD, and Beth Connors-Manke, DUS.

On April 16, 2014 the Food Science program assessment committee contacted Elizabeth A. Connors Manke and Deborah Kirkman regarding GCCR information - application guidance. We informed them that the Food Science students (in the CAFE) have been required to take WRD 203 to satisfy the university GWR for many years. Now with the switch to the GCCR, and the associated documentation, we would like to know if we can work together to meet this requirement. Our students have benefited greatly from having WRD 203, and even if it is not used to meet the GCCR requirements, we think they should continue take this course.

On Apr 16, 2014, Deborah Kirkman, Associate Director of the Division of Writing, Rhetoric, and Digital Studies, contacted the Food Science assessment officers and informed us that the WRD department faculty would be happy to meet with us to discuss a partnership between WRD and Food Science. She noted that several programs in AG have required their students to take our business-writing course long before the university had a GWR or GCCR requirement. She also attached a current WRD 203 generic syllabus along with one representative instructor's detailed daily schedule, assignment descriptions, and grading rubrics. We were informed that the WRD instructors can take different approaches to the short report, group proposal, and digital media assignments.

Dr. Kirkman also noted that the current design of this GWR course also meets GCCR requirements for multiple majors since the assignments encourage students to draw upon their own individual fields and future professional plans. She also noted that we can discuss this issue as well as the GCCR proposal form and a MOA at a future meeting.

On April 16th 2014 the Food Science assessment committee contacted the UK WRD department (Deborah Kirkman, Elizabeth Cornnors Manke and Adam J. Banks) and provided a draft memorandum of agreement in anticipation of our meeting. This MOA was largely based on the MOA that the College of Agriculture, Food and Environment's Biosystems and Agricultural Engineering had prepared. We informed the WRD department that at their convenience Dr. Hicks (our director of undergraduate studies) and Luke Boatright (Food Science Program Coordinator and Chair of the Assessment Committee) will be happy to meet in their office. We noted that our undergraduate Food Science program typically has about 10-

20 freshman students entering the program each year, and thus they may not require the same consideration (e.g., extra class sections) that a larger program would.

On Apr 17, 2014, Deborah Kirkman replied stating that A Tuesday morning meeting may be possible. She would check with Adam and Beth and get back to us. Dr. Kirkman also noted that based on comments from a WRD's GCCR committee representative that the committee will not be meeting any more this semester, so there probably is no longer the need to rush frantically to get GCCR approval this semester.

On April 22, 2014 Drs. Hicks and Boatright met with representatives from the WRD department and discussed the possibility of incorporating the GCCR requirements into an upper-tier WRD Business writing course, and all the considerations involved.

On April 22, 2014, the Food Science Assessment Committee contacted Deborah Kirkman and Elizabeth Connors Manke of the WRD department regarding GCCR information - application guidance. We provided the WRD department with a copy of the Food Science program's previous GCCR proposal (in a pdf format) that was designed to be done within our existing Food Science courses. Fortunately, it was rejected (due to one minor issue) and we have a chance to change our approach. We also provided a revised/draft GCCR form that incorporates WRD 203. We noted that we would look for comments from the WRD department on how to change these descriptions, if necessary. We also attached a draft of the memorandum of agreement (MOA) for a 4-year period. This could be changed to a 5-year period to match our IFT assessment cycle.

April 22, 2014 Deborah Kirkman, Associate Director of the Division of Writing, Rhetoric, and Digital Studies, University of Kentucky informed the UK Food Science Assessment Committee that they received the materials that they had requested (relating to the structure of our GCCR relationship). We were also informed that at the WRD steering committee meeting, the membership agreed to put a Food Science/WRD GCCR partnership agreement on the agenda for next Tuesday's full faculty meeting. After that meeting, they would get back to us ASAP with a report and to iron out any final details. She also noted that the WRD representatives were confident that they would get approval to move forward with this partnership.

May 2, 2014, the Food Science Assessment Committee was contacted by Beth Connors-Manke, Ph.D., Director of Undergraduate Studies of the Division of Writing, Rhetoric, and Digital Studies, University of Kentucky. She informed us that no one raised any objections in discussion at the WRD faculty meeting so, although it hasn't officially been voted on, it's safe to move forward with what we discussed.

May 9, 2014, the Food Science Assessment Committee met with WRD faculty representatives, along with both the DUS/assessment officers from the UK Animal Science program and the Equine Science program. We were informed from the WRD department (based on today's meeting) that WRD's game plan is to get their side of the paperwork done over the summer and have their faculty vote on the partnership as soon as their chair will put it on the agenda in the fall (this should be the first meeting of the year). For the WRD committee this means:

- 1) making the WRD 203: Business Writing syllabus GCCR compliant, including adding in the Food Science program student learning outcome(s)
- 2) working with the Food Science program to pin down the assessment schedules, any rubrics your accrediting agencies may have, and gathering a sample or two of writing in your field(s)
- 3) resolving any questions about the MOA
- 4) sending the Food Science program a copy of the syllabus for WRD 204: Technical Writing, which is the course that has already been approved for our partners in Engineering. WRD did send a copy of that syllabus, along with a .rtf copy of a draft of the MOA for easier editing on your part.

May 9, 2014 the UK Food Science program supplied the UK Writing, Rhetoric and Digital Studies Department with drafts of the necessary forms and memorandum of agreement to officially establish a joint effort to implement a GCCR teaching/assessment program. The Food Science program notified the WRD program that once we get a draft version of the WRD 203 syllabus that resembles the GCCR requirements, we can insert the appropriate information into Section 5 of the attached tentative GCCR form (under Instructional plan). We provided the WRD department with a draft of the memorandum of agreement (MOA) for a 5-year period because our national accreditation cycle is 5 years. We provided the WRD department an outline, and three examples of student submissions, of a writing assignment from our capstone course (FSC 536) Advanced Food Technology, and that we can provide more details and examples of writing assignments in our Food Science program to better coordinate our efforts in the future.

On July 9, 2014 Drs. Luke Boatright and Fred Payne met to discuss the arrival of Dr. Bode Adedeji and the transition from teaching AEN 340 to Dr. Adedeji. We reviewed the IFT core competencies that relate to AEN 340, the assignment of Bloom's Taxonomy values, and to the use of rubrics in the evaluation student learning outcomes.

The following is a general description that we discussed about the use of rubrics in evaluation each core competency and student learning outcome. For each core competency covered in a class we need to develop a rubric (a 4-point scale to use as an evaluation tool). These can be evaluated based on selected student assignments, projects, etc. These should be coordinated with regard to the "level of difficulty" among all the classes in the program that address the same core competency. When combined one would expect to see that our students are learning as they go through the program. The assessment professionals that review our work consider this a direct measurement of learning.

So, for example under "Applied Food Science" the core competency "be able to apply the principles of food science to control and assure the quality of food products" is covered in several classes across our bachelor's program. First we develop a rubric for that SLO. The following is the series developed for that SLO:

Be able to apply the principles of Food Science to control and assure the quality of food products	Demonstrate understanding of the applications of principles in quality control	Can apply the principles in basic operations encountered in quality control	Can apply the principles in complex situations encountered in quality control	Can apply the principles in complex situations (specific to different types of product) encountered in quality control
	Score (1)	(2)	(3)	(4)

We would then supply our assessment officer with the rubric used, the details of the assignment, the individual scores as well as the class average.

Once Dr. Adedeji is settled in we will need to arrange a meeting to discuss these assessment issues.

2013-2014 Primary Program Modifications resulting from Assessment:

The following draft memorandum of agreement and GCCR form represent the current structure of the merger of our GCCR assessment efforts between the UK Food Science department and the UK Writing, Rhetoric and Digital Studies Departments. It appears that these formal agreements can be finalized in late August 2014. This agreement will all for a joint oversight of our students composition and communication training.

Memorandum of Agreement

Department of Writing Rhetoric and Digital Studies (WRD) and Department of Animal & Food Sciences

University of Kentucky

WRD providing a Graduation Communication and Composition course for Food Science students.

Effective: Aug 31, 2014 through August 30, 2019

Background

The University Senate has voted to transform the current graduation-writing requirement (GWR) into a graduation composition and communication requirement (GCCR) that is appropriate for the academic program a given major represents. The GCCR will be anchored by writing appropriate to the discipline. It will also include at least one other modality of communication—oral or visual. The Senate has established the principles and requirements of the GCCR, and the Food Science faculty in the Department of Animal & Food Sciences has voted to fulfill the requirement by one class.

Faculty from both the WRD and Food Science programs have recently discussed the requirements and the type of communication relevant to Food Science graduates. From those discussions, and subsequent planning, the Food Science faculty voted to formally require that the GCCR for the Food Science program be satisfied by WRD 203. The course shall be administered to ensure that it is appropriate for the Food Science program.

Agreement

1. WRD shall have the WRD203 approved as a GCCR course. In general the course will have the following specific requirements: written assignment(s) of at least 4,500 words in English (the equivalent of 12-15 pages of double-spaced, typewritten text), student presentations of at least 10 minutes in English, and evidence of draft/feedback/revision process on the required GCCR assignment(s).
2. The WRD course shall have a specific program learning outcome and assessment plan focused directly on the GCCR. The assessment plan will include (a) clear goals for successful achievement of the GCCR, (b) specific criteria and rubrics for systematically assessing student work, and (c) a cogent description of how assessment results will be utilized to revise GCCR instruction and/or curriculum if the goals are not met. The Food Science program will be using this information as part of the program

accreditation by the Institute of Food Technologists and reporting requirements to the University Senate.

3. WRD shall offer enough sections (no more than 30 students per section) each year so that Food Science students (approximately 10-20 students per year) can fulfill the GCCR.
4. WRD and Food Science shall coordinate scheduling of the WRD203 course to minimize scheduling conflicts with required Food Science courses.
5. Food Science faculty shall, from time to time, provide to WRD faculty/instructors examples/types of communication appropriate for graduates of the Food Science program.
6. Faculty designated by the WRD Director and Food Science Director of Undergraduate Studies shall meet annually to review the course assessment results, the assignments, and recommend improvements/changes to the course and/or assignment to ensure consistency with the needs of the Food Science program graduates. The results will be reported to the Food Science faculty as a whole, and used in the Food Science program's accreditation reports.
7. WRD shall investigate the possibility of obtaining approval of WRD203 for UKCore. WRD faculty shall solely decide if UKCore approval is in the best interest of the WRD program.
8. Food Science faculty have already approved the WRD203 as the GCCR, appropriate for the Food Science program graduates, and will maintain this as a program requirement.

Renewal

This initial agreement shall be for 4 years with the possibility of renewal. In the year prior to the expiration year of the agreement, program faculty from each program will review and consider this agreement renewal. If agreed to by both programs, the renewal shall be approved 6 months prior to contract expiration. Renewals shall not be for less than a 3 year term.

Termination

In the unlikely event that either program would like to terminate this agreement, the program initiating termination shall give the other program a 1-year written notice of intent to terminate this agreement. In addition, if the University Senate fails to approve the GCCR, eliminates the requirement once formally approved, or significantly changes the requirement, then this agreement shall become null and void.

Adam Banks, WRD
Professor and Director

Bob Harmon, AFS
Professor and Chair

**Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM**

I. General Information:

College:	<u>Agriculture, Food and Environment</u>	Department (Full name):	<u>Animal & Food Sciences</u>
Major Name (full name please):	<u>Food Science</u>	Degree Title:	<u>B.S. in Food Science</u>
Formal Option(s), if any:	_____	Specialty Field w/in Formal Options, if any:	_____
Requested Effective Date:	<u>FALL 2014, IF RECEIVED BY SENATE COUNCIL BY MONDAY, APRIL 7.</u>		
Contact Person:	<u>Luke Boatright</u>	Phone:	<u>257-5988</u>
		Email:	<u>luke.boatright@uky.edu</u>

II. Parameters of the Graduation Composition and Communication Requirement (GCCR):

The new GCCR replaces the old Graduation Writing Requirement. It is fulfilled by a course or courses specified within a B.A./B.S. degree program. As outlined in draft Senate Rule 5.4.3.1, the GCCR stipulates that students must successfully complete this requirement after achieving sophomore status and prior to graduation. To satisfy the GCCR, students must earn an average grade of C or better on the designated Composition and Communication (C&C) intensive assignments produced in any given course designated as fulfilling some or all of the GCCR. The requirements for GCCR courses include:

- at least 4500 words of English composition (approximately 15 pages total);
- a formal oral assignment or a visual assignment;
- an assignment demonstrating information literacy in the discipline;
- a draft/feedback/revision process on GCCR assignments.

The program requirements for the GCCR include:

- at least one specific Program Student Learning Outcome for C&C outcomes;
- a plan for assessing both the writing and oral or visual components of the GCCR;
- clear goals, rubrics, and revision plans for GCCR implementation.

Upon GCCR approval, each program will have a version of the following specification listed with its Program Description in the University Bulletin:

“Graduation Composition and Communication Requirement. Students must complete the Graduation Composition and Communication Requirement as designated for this program. Please consult a college advisor or program advisor for details. See also ‘Graduation Composition and Communication Requirement’ on p. XX of this Bulletin.”

III. GCCR Information for this Program (by requirement):

A. List the courses currently used to fulfill the old Graduation Writing Requirement:

WRD 203 Business Writing

B. GCCR Program Outcomes and brief description:

1. Please specify the Major/Program Student Learning Outcomes (SLOs) pertaining to Composition & Communication and the GCCR requirement. These are *program* outcomes, not *course* outcomes. Please specify the program-level SLOs for C&C in your program:

Demonstrate communication, computer and information technology skills necessary to obtain, analyze, interpret and convey scientific information to individuals or groups at various educational levels.

2. Please provide a short GCCR description for your majors (limit 1000 characters): Please explain the GCCR requirement in language appropriate for undergraduate majors to understand the specific parameters and justification of your program’s GCCR implementation plan:

Food Science students are required to take Business Writing (WRD203), which focusses on written communication skills plus oral communication skills. Previously approved for GWR, this course is being submitted for GCCR approval. We have developed an agreement (see attached) where the WRD program will fulfill the majority of our communication SLO. As part of our

**Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM**

accreditation requirements, communication is a key component. Biosystems Engineering faculty have provided to WRD faculty several typical communication examples to help structure the assignments/requirements for the GCCR course.

C. Delivery and Content:

<p>1. Delivery specification: for your major/program, how will the GCCR be delivered? Please put an X next to the appropriate option. (Note: it is strongly recommended that GCCR courses be housed within the degree program.)</p>	<input type="checkbox"/> a. Single required course within program
	<input checked="" type="checkbox"/> b. multiple required or optional courses within program
	<input checked="" type="checkbox"/> c. course or courses outside program (i.e., in another program)
	<input type="checkbox"/> d. combination of courses inside and outside program
	<input type="checkbox"/> e. other (please specify): _

2. Basic Course Information: Please provide the following information for course(s) used to satisfy the GCCR, either in whole or in part:

Course #1: Dept. prefix, number, and course title: WRD 203 Business Writing

- new or existing course? existing GWR course, but will be submitted for approval as GCCR (new courses should be accompanied by a New Course Proposal)
 - if a new course, check here that a New Course Proposal has been submitted for review via eCATS
- required or optional? required
- shared or cross-listed course? no
- projected enrollment per semester: 15

Course #2 (if applicable): Dept. prefix, number, and course title: _____

- new or existing course? _____ (new courses should be accompanied by a New Course Proposal)
 - if a new course, check here that a New Course Proposal has been submitted for review via eCATS
- required or optional? _____
- shared or cross-listed course? _____
- projected enrollment per semester: _____

Course #3 (if applicable): Dept. prefix, number, and course title: _____

- new or existing course? _____ (new courses should be accompanied by a New Course Proposal)
 - if a new course, check here that a New Course Proposal has been submitted for review via eCATS
- required or optional? _____
- shared or cross-listed course? _____
- projected enrollment per semester: _____

3. Shared courses: If the GCCR course(s) is/are shared from *outside* the program, please specify the related department or program that will be delivering the course(s). Please provide the following:

- Contact information of providing program:**
WRD 203 Business Writing
- Resources:** what are the resource implications for the proposed GCCR course(s), including any projected budget or staffing needs? If multiple units/programs will collaborate in offering the GCCR course(s), please specify the resource contribution of each participating program.
- Memorandum of Understanding/Letter of Agreement:** Attach formal documentation of agreement between the providing and receiving programs, specifying the delivery mechanisms and resources allocated for the specified GCCR course(s) in the respective programs (include with attachments).
Date of agreement: see attached

4. Syllabi: Please provide a sample syllabus for each course that will be designated to fulfill the GCCR. Make sure the following things are clearly indicated on the syllabi for ease of review and approval (check off each):

- the GCCR assignments are **highlighted** in the syllabus and course calendar;
- the GCCR assignments meet the minimum workload requirements as specified by the Senate Rules for GCCR courses (see the draft Senate GCCR rule linked [here](#));
- the elements are specified in the syllabus that fulfill the GCCR requirement for a clear draft/feedback/revision process;
- the grade level requirements for the GCCR are specified on the syllabus (i.e., an average of C or better is required on GCCR

**Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM**

<p>assignments for credit);</p> <ul style="list-style-type: none"> • the course or sequence of courses are specified to be completed after the first year (i.e. to be completed after completing 30 credit hours) for GCCR credit; • the course syllabus specifies "This course provides full/partial GCCR credit for the XXX major/program" <ul style="list-style-type: none"> ○ if the course provides partial GCCR credit, the fulfilled portion of the GCCR must be specified and the other components of the GCCR for the program must be specified: e.g. "This course provides partial credit for the written component of the GCCR for the XXX major/program in conjunction with Course 2"
<p>5. Instructional plan: Summarize the instructional plan for teaching the C&C skills specified in the program SLOs and delivered in the course(s). Include the following information in brief statements (1000 characters or less). Information can be cut-and-pasted from the relevant sample syllabus with indications where on the syllabus it is found:</p>
<ul style="list-style-type: none"> • overview of delivery model: summarize how the GCCR will be delivered for all program majors: explain how the delivery model is appropriate for the major/program and how it is offered at an appropriate level (e.g. required course(s), capstone course, skills practicum sequence of courses, etc.):
<p><u>WRD 203 is primarily delivered as a 16 week, face-to-face, inquiry-based course. Instructors deliver few lectures, and students work individually, in small groups, and in large groups through discussions of course readings and practical applications of course skills and ideas. The course is appropriate for majors in Food Science because the communication focusses on the types engineers practice.</u></p>
<ul style="list-style-type: none"> • assignments: overview or list of the assignments to be required for the GCCR (e.g. papers, reports, presentations, videos, etc.), with a summary of how these GCCR assignments appropriately meet the disciplinary and professional expectations of the major/program:
<p><u>There are eight assignments in WRD 203:</u></p> <ol style="list-style-type: none"> <u>1) 4 brief individual writing assignments that help students build foundational approaches to argument, design, audience, and information literacy in technical communication genres (2,500–3,00 words total)</u> <u>2) A collaboratively planned and written informational report based upon an organizational site study (3,000–4,000 words total)</u> <u>3) An individual proposal for the final lab or recommendation report (750–1,000 words)</u> <u>4) An individual presentation that stresses oral and visual delivery, structured as a progress report that covers research and findings for the final lab or recommendation report</u> <u>5) An individual final lab or recommendation report (3,000 words minimum, not including references or appendices)</u>
<ul style="list-style-type: none"> • revision: description of the draft/feedback/revision plan for the GCCR assignments (e.g. peer review with instructor grading & feedback; essay drafting with mandatory revision; peer presentations; etc.):
<p><u>Each of the major assignments includes clearly identified stages of planning, drafting, peer feedback, instructor feedback, and final instructor grading and feedback. More important, major norms of organization and development in technical writing are modeled in class. Students build drafts in stages (e.g., methods section of collaborative report is peer and instructor reviewed in class during Week 7; analysis section of collaborative report is peer and instructor reviewed in Week 9), with both instructor and peer feedback during development. At each stage, drafts are compared to previous models and scaffolds.</u></p>
<ul style="list-style-type: none"> • other information helpful for reviewing the proposal:
<p><u>Together, these assignments provide students with practice in the major genres and norms of technical writing and communication. Because the course is inquiry-based, students apply technical writing norms to their discipline, drawing from both primary and secondary research in their field.</u></p>
<p>D. Assessment:</p> <p>In addition to providing the relevant program-level SLOs under III.B, please specify the assessment plan at the program level for the proposed course(s) and content. Provide the following:</p>
<ul style="list-style-type: none"> • specify the assessment schedule (e.g., every 3 semesters; biennially):
<p><u>Annual review of the outcome/course/assignments by Food Science Assessment Committee, with formal assessments occurring per accreditation cycle (5 yr).</u></p>
<ul style="list-style-type: none"> • identify the internal assessment authority (e.g. curriculum committee, Undergraduate Studies Committee):
<p><u>Food Science Assessment Committee</u></p>
<ul style="list-style-type: none"> • if the GCCR course(s) is/are shared, specify the assessment relationship between the providing and receiving programs:

**Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM**

explain how the assessment standards of the receiving program will be implemented for the provided course(s):
<u>The WRD faculty will identify the artifacts, collect the assessment data. The Food Science Assessment Committee will review, make recommendations and report the information for our accreditation.</u>

**Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM**

Signature Routing Log

General Information:

GCCR Proposal Name (course prefix & number, program major & degree):	Food Science GCCR
Contact Person Name:	Luke Boatright
Phone:	7-5988
Email:	luke.boatright@uky.edu

Instructions:

Identify the groups or individuals reviewing the proposal; record the date of review; provide a contact person for each entry. On the approval process, please note:

- Proposals approved by Programs and Colleges will proceed to the GCCR Advisory Committee for expedited review and approval, and then they will be sent directly to the Senate Council Office. Program Changes will then be posted on a web transmittal for final Senate approval in time for inclusion in the Fall 2014 Course Bulletin.
- New Course Proposals for the GCCR will still require review and approval by the Undergraduate Council. This review will run parallel to GCCR Program Change review.
- In cases where new GCCR courses will be under review for implementation after Fall 2014, related GCCR Program Changes can still be approved for Fall 2014 as noted "*pending approval of appropriate GCCR courses.*"

Internal College Reviews and Course Sharing and Cross-listing Reviews:

Reviewing Group	Date Reviewed	Contact Person (name/phone/email)
Home Program <i>review by Chair or DUS, etc.</i>		/ /
Providing Program <i>(if different from Home Program)</i>		/ /
Cross-listing Program <i>(if applicable)</i>		/ /
College Dean		/ /
		/ /

Administrative Reviews:

Reviewing Group	Date Approved	Approval of Revision/ Pending Approval ¹
GCCR Advisory Committee		

2. 2013-14 Program Improvements/modifications to the Food Science student-learning outcome #1: Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development. “Be able to apply the principles of Food Science to the control and assure the quality of products”

The current Food Science curriculum revisions under review by the College of Agriculture, Food and Environment will include FSC 304 among the courses required by our undergraduate program (3-of-4 possible courses available). In 2013 an official course change for FSC 304 was submitted to the University of Kentucky Senate and included the following course modifications (**see Appendix 7**):

1. **Title:**

The proposed title is changed from “ANIAMAL DERIVED FOODS” TO “ANIMAL FOOD PRODUCTS”. This title will accurately reflect the content of the course – dealing with processed food products (e.g. ready-to-eat meats) as well as fresh foods (e.g. fresh seafood) originating from animals. Furthermore, this will provide better visibility for the course among students.

2. **Offering frequency:**

The course will be offered only in the spring semester of even years, starting spring 2014. This change will ensure a larger pool of students for team work in lab sessions. This will also enhance economic and efficient utilization of departmental resources such as meat lab.

3. **Prerequisite:**

The proposed pre-requisite is FSC 107. The current pre-requisite is outdated and is no longer offered. The pre-requisite FSC 107 will ensure that the students take FSC 304 after establishing a sound base in fundamentals of food science. This strategy will also enable students to comprehend the advanced materials taught in the course.

4. **Credit hours:**

The proposed number of credit hours is 4 (3 hours lecture + 2 hours lab per week). Two hours per week are sufficient to cover the lab topics.

3. 2013-14 Program Improvements/modifications to the Food Science student-learning outcome #1: Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development. “Understand the principles of sensory analysis”

“Sensory Evaluation of Foods” (FSC 430) was approved by the University of Kentucky Senate as a new Food Science Course in 2009. The assessment process that led to the development of this course was described in the UK Re-approval application in 2009. Since that time, FSC 430 was included in the Food Science curriculum as a specialty support course in 2010. The current Food Science curriculum revisions under review by the College of Agriculture, Food and Environment will include FSC 430 among the courses required by our undergraduate program. Based on the assessment of student performance in the course in 2010 and 2012, the following course modifications will be incorporated for the Fall of 2014 (FSC 430 is taught every other year):

1. Use of innovative electronic (paper-less) methods in sensory data harvest and analyses (i.e. using iPads and mobile devices) will be included
2. More industry field trips will be implemented in fall 2014 to R&D facilities in Kentucky and Ohio
3. Interactions with and guest lectures by industry leaders (in Kentucky and Ohio) will be included

IX. Future Goals and Planning for Improvement.

The proposed 5-year assessment (2015-2019) plan for the UK Food Science program is outlined in **Appendix 6** of this proposal. During this period the two most significant student learning initiatives we have added as a result of our recent assessment efforts will be implemented and will continue to be assessed.

Beginning in the Fall of 2013 all incoming freshmen will be required to complete an Academic Enrichment Experience (AEE) requirement. This requirement will be typically be satisfied by either our internship program (FSC 399) or our Special Problems course (FSC 395) that typically involved a laboratory project. Because students typically do not take these courses until their junior or senior years, the complete implementation of the AEE will not occur until the Fall of 2015 or 2016. The outline of this program is outlined on pages 26-28 of this re-approval application. Our student internship program has been strength of the UK Food Science program for many years. Please see our 2009 IFT re-approval application for further details. Implementation of the AEE and enhanced assessment tools outlined in this current application should further strengthen this program.

The other major student learning initiative that should be implemented during this period is the Graduation Composition and Communication Requirement (GCCR). Beginning in the fall of 2014 all incoming freshmen will be required to complete the GCCR requirement. After several meetings with representatives from the University of Kentucky Writing Rhetoric and Digital Studies department (see pages 39-49 of this re-approval application), we have verbal assurances that these forms can be completed and signed early in the fall semester (neither the WRD or CAFE curriculum committees meet over the summer). Once approved by both the college and UK undergraduate curriculum committees we can begin to implement the proposed changes.

Both the AEE and the GCCR are major changes to our program, address key student success skills, and will require continuing assessment activities to assure that these programs are implemented effectively. Our memorandum of agreement with the UK WRD department to address the GCCR has incorporated many important interdepartmental activities including regular assessment meetings.

The UK Food Science program will begin going through a very important transition to a new assessment officer in late 2014. Our program is required to submit both yearly IFT assessment reports as well as yearly UK assessment reports (based the assessment requirements of the Southern Association of Colleges and Schools). Because the yearly reports will be due next year on August 31st and October 31st, respectively, we should begin to get our new assessment officer involved beginning in late 2014 to help with the transition. This new officer will be responsible for submitting next year's assessment reports to both Larry Grabau (the CAFÉ associate dean of instruction) and the IFT HERB. Luke Boatright will be completing two full 3-year terms as the Food Science program assessment officer. Our current assessment activities bear little resemblance to what we had to do 10 years ago, and in the future they are likely continue to evolve. Because of the IFT 5-year cycle, we will be considering a change to the 3-year cycle that we have used in the past. We will be considering either a 5-year appointment for our assessment officer (to match the IFT cycle), or change the structure of our assessment officials to have a chair and co-chair that are both actively involved. The co-chair would become the chair after a 3-year term, and hopefully this would help with the transition and the completion of the IFT application in another 5 years.

Another key assessment issue will be the hiring of a new Food Science Extension/Teaching professor and a new professor to teach Food Engineering (AEN 340). Both of these professors will need to be trained in the area of assessment to assure that they evaluate our student learning outcomes using the appropriate methods.

APPENDIX E

Assessment Progress Report

(To be submitted to IFT's Higher Education Review Board By August 31 of each year after being granted IFT Approval/Re-approval Status)

If your program proposed a learning assessment plan in your initial or re-approval application, completing the Assessment Progress Report template will be straightforward. The Assessment Progress Report entails specifying the program outcome(s) or course learning outcome(s) that were assessed and the methods that were used to assess them each year after initial approval or re-approval. The other two components of the Assessment Progress Report are: (1) a summary of what the assessment showed, and (2) a detailed description of how the information was/is being used to improve the program and/or student learning.

The Assessment Progress Report template is shown below.

ASSESSMENT PROGRESS PREPORT (_____ - _____ ACADEMIC YEARS)	
Food Science Program: Name of coordinator: Title: E-mail:	Faculty who participated in the development or approval of this Assessment Progress Report (please list all):
I. PROGRAM OUTCOME(S) OR COURSE LEARNING OUTCOME(S) THAT WERE ASSESSED IN THE _____ - _____ ACADEMIC YEARS, METHODS USED, AND KEY FINDINGS List the outcomes that were assessed, the methods that were used to assess each outcome, and summarize key findings. Attach all relevant rubrics. Add more boxes if more than three outcomes were assessed. The first set of boxes provides an example of course learning outcomes, assessment techniques, and summary of key findings.	
OUTCOME MEASURED	Example of course learning outcomes (related to interaction skills): 1. Work effectively with others. 2. Provide leadership in a variety of situations. 3. Deal with individual and/or group conflict.
Method(s) of Assessment	1. Grade received for completeness of write-up for group project(s) 2. Grades received by a group member on critique of draft group paper (following a rubric of what is expected of a paper for a group project). 3. Peer evaluation grade for each group members (students turns in a grade for each group member based on expectations agreed upon by the group). Each student must provide reasons for the grade given. 4. Weekly journal write-ups submitted by students reflecting on how group projects progressed during the previous week.

Summary of Key Findings	<ol style="list-style-type: none"> 1. Grades received for joint group papers give a good idea of how much time and effort each group spent on the write-up. 2. Individual critique grade tells how much effort was given to group paper. 3. The average grade calculated from all the peer evaluation provides a good insight on the contribution of each group member (from student's perspective). 4. Weekly journal entries provide instructor with current critical information on how well a group is working or how much dissension there is.
OUTCOME MEASURED	
Method(s) of Assessment	
Summary of Key Findings	
OUTCOME MEASURED	
Method(s) of Assessment	
Summary of Key Findings	
OUTCOME MEASURED	

Method(s) of Assessment	
Summary of Key Findings	

II. ACTIONS BEING TAKEN AS A RESULT OF THE ABOVE RESEARCH FINDINGS

In the space below, interpret the above research findings in light of program expectations for student achievement. Discuss the meaning of the learning assessment findings in relation to desired student proficiency. Describe how these findings were used, or are being used to improve student learning (very important). If changes are being made to courses or the food science program, summarize these changes. If lessons were learned during implementation of the learning assessment, and changes will be made to future assessments as a result, discuss here. (Sometimes an assessment does not go exactly as planned and it is not possible to draw conclusions reliably. If this occurred, describe what happened and what will be done in the future to remedy it.)

Resource: Permission to use this form granted by Lisa Kramer info@PAERconsulting.com.

Food Science Leadership Development 2012

Date of report: **August 7, 2012**

▼ [Table of Contents](#)

[Collapse All](#)

About this Improvement Project

⤴ Settings

Improveme Food Science – Bachelor
nt Project
Owner:

Details

* Title Food Science Leadership Development 2012

* Academic
Year

* Wednesday, May 9, 2012
Assessment
Date

Improvement Project Objectives

Name	Description	Status	Public
Leadership Development			No

⤴ [Back to top](#)

Improvement Project Objectives

⤴ Leadership Development

Details

Please copy or type the student learning outcomes that were assessed this reporting cycle. If you assessed more than one student learning outcome this reporting cycle, you must submit each outcome individually, along with its associated methods and tools, benchmarks, results, analysis, and improvement actions.

To find your outcome, click 'Browse,' then choose 'Program Goals' on the left side column.

Your report will be evaluated by the the University Assessment Council (UAC) using the rubric attached [here](#). Please refer to this rubric when completing this form.

* Title Leadership Development

* Student Learning Outcomes fdsci.b: Organization

Methods

Details

There are two components to this section, **Assessment Methods and Tools** and **Target/Benchmark**. Please remember that Assessment Methods and Tools and Target/Benchmark for each learning outcome must be submitted individually.

1. In order to achieve a meets expectations for the Assessment Methods and Tools criterion the following must be evident:

"A general explanation is provided about how the assessment tool(s) related to the outcomes measured (e.g., the faculty wrote test items, essay questions, etc to match the outcome, or the instrument was selected 'because its general description appeared to match our outcome'). May include pass rates for license or certification exams. Assessment tools specified by a program's accrediting body are considered to meet expectations, but it must be made clear to the reader that the tool is chosen by the accrediting body. If more than one outcome is linked to any on assessment tool, and explanation is provided for how each outcome can be measured using only one tool."

AND

"Enough information is provided to understand the data collection process, such as a description of the sample, evaluation protocol, evaluation conditions, and student motivation, when and where the data was collected (e.g., were students sampled, or was the population evaluated, adequate motivation, two or more trained raters for performance assessment, pre-post design to measure gain, cutoff defended for performance vs. a criterion)."

2. The Target/Benchmark component is where expected minimum levels of achievement are noted. (For example, 80% achieve a score of 4.) At the minimum, provide a target determined by your program's faculty and/or staff. If desired, you may also provide a benchmark standard for comparison against similar programs in other universities.



**Assessment
Methods
and Tools**

1. Identify course(s), activities, exams, etc. where data were collected: 2009 and 2011 Alumni Survey, and 2010 Institute of Food Technologists (IFT) accreditation process

2. Term/Year of collection: Fall 2009 and Fall 2011 for the Alumni Surveys, and Spring 2010 for the IFT accreditation

3. Briefly describe what data were collected and how collected: Student comments were collected as part of an on-line biennial alumni survey and members of the IFT Higher Education Review Board comments were obtained as part of our IFT Food Science undergraduate accreditation.

4. Criteria used for evaluating student work: Alumni survey, & involvement of students in leadership positions e.g., club officers and college ambassadors

* Target/Benchmark 90 percent positive response on the alumni survey for Leadership/interpersonal skills preparation

Results

Details

To achieve a "Meets Expectations" for this criterion the following must be evident:

Results are present, and directly relate to outcomes. The desired benchmarks for the outcomes are clearly presented, and were derived by appropriate analysis. If a rubric or grading scale was used, it is clear how many in the sample scored in each category.

DO NOT COPY AND PASTE ANY IMAGE FILES. They will not show in the reports. If you would like to include these as part of your evidence, please add them to the Attachments tab.

* Results (Evidence/Data) Responses from the 2011 Food Science alumni survey were all positive for leadership/interpersonal skill preparation as part of the UK food science program. Students have been active in leadership positions (e.g., club officers and college ambassadors). Also, involvement in leadership development courses has been promoted.

Interpretation of Results

Details

To achieve a "Meets Expectations" for this criterion the following must be evident:

Interpretations of results seem to be reasonable inferences given the outcomes, targets/benchmarks, and methodology. It reflects a discussion of the results by pertinent parties. The position of the person or persons involved in the analysis is listed.

- ✱ Analysis See results of 2011 alumni survey, list of Food Science Club officers, list of College of Agriculture undergraduate ambassadors and minutes from a Food Science Club meeting.

Improvement Action

Details

To achieve a "Meets Expectations" for this criterion the following must be evident:

Examples of improvements (or plans to improve) are documented and directly related to findings of assessment. These improvements are very specific (e.g., approximate dates of and person(s) responsible for implementation, and where in curriculum/activities and department/program they will occur.)

If no improvements are found to be necessary then: the program must either increase the benchmark, or explain why the benchmark does not need to be increased; state plans to focus on another area of concern for future assessments and work to monitor and maintain the current level of success for this outcome.

- ✱ Improvement Action Continue to promote opportunities for students to pursue leadership development activities. Increase number of officer positions (and involvement) available in the Food Science Club and promote involvement in the College of Agriculture undergraduate ambassador program and community and leadership

program.

Attachments

Details

Please attach any documents that will be useful in the interpretation of your Annual Assessment Improvement Action Plan, or that will assist others in your program to conduct similar assessments. Appropriate documents may include: rubrics used for assessment, examples of tests; essay questions, or surveys used in the assessment process; tables or graphs of the data and/or large data sets.

GTD_Attach	Attachments	Type
	2012 FoodSci IAP leadership.pdf	Attachment

[^ Back to top](#)

Food Science Spring 2012

Date of report: **August 7, 2012**

▼ [Table of Contents](#)

[Collapse All](#)

About this Improvement Project

⤴ Settings

Improveme Food Science – Bachelor
nt Project
Owner:

Details

* Title Food Science Spring 2012

* Academic
Year

* Thursday, May 10, 2012
Assessment
Date

Improvement Project Objectives

Name	Description	Status	Public
Food Science Core Competencies			No

⤴ [Back to top](#)

Improvement Project Objectives

⤴ Food Science Core Competencies

Details

Please copy or type the student learning outcomes that were assessed this

reporting cycle. If you assessed more than one student learning outcome this reporting cycle, you must submit each outcome individually, along with its associated methods and tools, benchmarks, results, analysis, and improvement actions.

To find your outcome, click 'Browse,' then choose 'Program Goals' on the left side column.

Your report will be evaluated by the the University Assessment Council (UAC) using the rubric attached [here](#). Please refer to this rubric when completing this form.

* Title	Food Science Core Competencies
* Student Learning Outcomes	fdsci.b: Transition after graduation

Methods

Details

There are [two components to this section](#), **Assessment Methods and Tools** and **Target/Benchmark**. Please remember that Assessment Methods and Tools and Target/Benchmark for each learning outcome must be submitted individually.

1. In order to achieve a meets expectations for the Assessment Methods and Tools criterion the following must be evident:

"A general explanation is provided about how the assessment tool(s) related to the outcomes measured (e.g., the faculty wrote test items, essay questions, etc to match the outcome, or the instrument was selected 'because its general description appeared to match our outcome'). May include pass rates for license or certification exams. Assessment tools specified by a program's accrediting body are considered to meet expectations, but it must be made clear to the reader that the tool is chosen by the accrediting body. If more than one outcome is linked to any on assessment tool, and explanation is provided for how each outcome can be measured using only one tool."

AND

"Enough information is provided to understand the data collection process, such as a description of the sample, evaluation protocol, evaluation conditions, and student motivation, when and where the data was collected (e.g., were students sampled, or was the population evaluated, adequate motivation, two or more trained raters for performance assessment, pre-post design to measure gain, cutoff defended for performance vs. a criterion)."

2. The Target/Benchmark component is where expected minimum levels of achievement are noted. (For example, 80% achieve a score of 4.) At the minimum, provide a target determined by your program's faculty and/or staff. If desired, you may also provide a benchmark standard for comparison against similar programs in other universities.

* 2009 and 2011 Food Science
Assessment undergraduate alumni survey
Methods
and Tools

* 90 percent positive response on the
Target/Benchmark alumni survey for core food science items

Results

Details

To achieve a "Meets Expectations" for this criterion the following must be evident:

Results are present, and directly relate to outcomes. The desired benchmarks for the outcomes are clearly presented, and were derived by appropriate analysis. If a rubric or grading scale was used, it is clear how many in the sample scored in each category.

DO NOT COPY AND PASTE ANY IMAGE FILES. They will not show in the reports. If you would like to include these as part of your evidence, please add them to the Attachments tab.

* Results The 2011 Food Science alumni survey (Evidence/D indicated that after obtaining employment

ata) all respondents felt that they had been adequately prepared in the core food science areas. The percentage of students that felt they had been strongly prepared (ranking of 5 out of 5) increased in the 2011 survey compared to the 2009 survey.

Interpretation of Results

Details

To achieve a "Meets Expectations" for this criterion the following must be evident:

Interpretations of results seem to be reasonable inferences given the outcomes, targets/benchmarks, and methodology. It reflects a discussion of the results by pertinent parties. The position of the person or persons involved in the analysis is listed.

✳ Analysis See results of 2009 and 2011 alumni survey.

Improvement Action

Details

To achieve a "Meets Expectations" for this criterion the following must be evident:

Examples of improvements (or plans to improve) are documented and directly related to findings of assessment. These improvements are very specific (e.g., approximate dates of and person(s) responsible for implementation, and where in curriculum/activities and department/program they will occur.)

If no improvements are found to be necessary then: the program must either increase the benchmark, or explain why the benchmark does not need to be increased; state plans to focus on another area of concern for future

assessments and work to monitor and maintain the current level of success for this outcome.

- ✱
Improvement Action

In the 2011 Food Science undergraduate alumni survey, items relating to food engineering made up the majority of responses where students felt they had only been adequately prepared (3 out of a possible 5 ranking). Our goal is to increase the number of contact hours between the students and the primary instructor of this course, and to increase the number of "strongly prepared" responses on future surveys.

Attachments

Details

Please attach any documents that will be useful in the interpretation of your Annual Assessment Improvement Action Plan, or that will assist others in your program to conduct similar assessments. Appropriate documents may include: rubrics used for assessment, examples of tests; essay questions, or surveys used in the assessment process; tables or graphs of the data and/or large data sets.

GTD_Attach	Attachments	Type
	Survey online report 09.pdf	Attachment
	Survey online report 2011UG.pdf	Attachment

^ Back to top

UK Food Science Club Meeting
September 29, 2011 in Room N12 of the Ag. Science North Building

Those in attendance (club officers):

Rebecca Delles (President)
Jamie Greene (Outreach Coordinator)
Hayriye Cetin-Karaca (Vice-President)
Leeann Slaughters (Event Coordinator)
Dr. Surendranath Suman (Club Advisor)
Dr. Luke Boatright
Jing Zhao (Agriculture Counsel Liaison)
Mahesh Nair (Webmaster)
Brittney Flues (Treasurer)
Danielle Smothers (Secretary)
Jennifer Willig
Jenny Liu
Chungiang Li
Mengyi Xu

The meeting was called to order at 3:07 pm and the following items were discussed:

1. Food Science Club picnic at Dr. Hicks' farm on Saturday, October 15th. Anyone needing a ride should be in the Garrigus Building parking lot at noon. Dr. Hicks will provide the meat, and attendees are encouraged to bring a side dish.
2. The first fund-raising activity discussed was activities to support the club's involvement in "Dance Blue". A Halloween bake sale was proposed and tentatively set for some time in the middle of Oct. Participation in a "Fun Run" activity was also discussed. Details of these activities are to be finalized at a later date by the club's activities/event committee.
3. The next item discussed was the club's involvement in the state fair. A vote was taken on whether or not the club should be involved in future state fair "Dairy Booths". The vote was unanimous that the club would not participate next year. The dwindling profit from this activity and the reduction in other clubs involved was mentioned as primary considerations. Continued involvement in the "Ham Booth" was affirmed. The desire to have alternate sources of income before finalizing the club's withdrawal from the "Dairy Booth" was discussed. Formation of a committee to develop other fundraising activities was proposed and volunteers to serve on this committee included Rebecca Delles, Jamie Green and Leaann Slaughters.
4. Involvement in the IFT College Bowl was discussed. The team can have two graduate students maximum and should contain at least four undergraduate students. Possible team members mentioned included

Danielle Smothers (Captain), Brittney Flues, Tim and one other undergraduate member to be determined. The need for college bowl type buzzers was discussed.

5. Other IFT type competitions proposed by Jennifer Willig included: participation in the “Wellness Conference” in March in Chicago sponsored by the Canola Oil Board, the IFT Product Development competition, and a “Developing Countries” product development completion.
6. Dr. Elisabeth Pohl of the UK College of Agriculture Center for Leadership Development presented information of two program that provide undergraduate students with the opportunity to develop their leadership and interpersonal skills. The “Turner Leadership Development” program and the “Explorations in Leadership” program. This later program will be accepting new participants until November 20th. Item discussed included the program requirements, meeting times, program contents, and length of the programs. This was followed by a discussion of what is expected of participants and how participation benefits students. Two videos of former graduates of this program was shown highlighting the benefits of the leadership development program.
7. The Bluegrass IFT suppliers Night on Tuesday October 11th was discussed and volunteers to help with set-up of the exhibition hall and for cleanup at the end of the event were recorded.



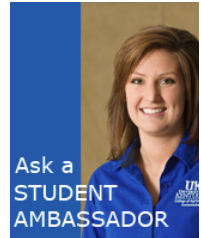
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The University of Kentucky College of Agriculture & School of Human Environmental Sciences have an amazing array of student leaders from across the College. Ambassadors are selected from a diverse applicant pool that are nominated by their professors, faculty, staff and their peers. The Ag Ambassadors are a select group of agricultural students dedicated to enhancing the image of and interest in the COA and UK. The Ag Ambassadors serve the agricultural industry in Kentucky in a variety of capacities such as hosting agricultural related functions, speaking on behalf of agriculture to various groups, and assisting in recruitment efforts for the College of Agriculture. We consider them to be the "best of the best."







[Request an Ambassador Form](#)

[Other Questions? - Contact the Director of Student Relations](#)

2011-2012 Ag Ambassadors

Name	Who Are They?	Hometown
 Porsha Batts	<ul style="list-style-type: none"> • Major: Family Science • Activities: • Hobbies and Interests: Art, Design, and Writing 	Paintsville, KY
 Sarah Kate Rice	<ul style="list-style-type: none"> • Major: Food Science • Activities: Alpha Delta Pi sorority, Ag Student Council Food Science Representative, Institute of Food Technologies. • Hobbies and Interests: Volunteering, Outdoors, Cooking, Spending time with friends 	Hickman, KY

 <p>Davis Jackson</p>	<ul style="list-style-type: none"> • Major: Plant and Soil Science • Activities: FarmHouse fraternity, UK Trap and Skeet Club • Hobbies and Interests: Being outdoors, Spending time with family and friends 	<p>Morganfield, KY</p>
 <p>Hannah Shear</p>	<ul style="list-style-type: none"> • Major: Animal Science/ Agricultural Economics • Activities: Livestock Judging, Block and Bridle, Agribusiness Club, CATS tutor • Hobbies and Interests: Intramural Sports 	<p>Winchester, KY</p>
 <p>Kendall Corbin</p>	<ul style="list-style-type: none"> • Major: Agricultural Biotechnology • Activities: Ag Student Council, Alternative Spring Break site leader, Horticulture research • Hobbies and Interests: Showing cattle, Traveling, Volunteering 	<p>Flemingsburg, KY</p>
 <p>Sandra Broadus</p>	<ul style="list-style-type: none"> • Major: Natural Resource & Environmental Science • Activities: Work in an entomology lab • Hobbies and Interests: Kayaking, Hiking, Camping, Reading 	<p>Guston, KY</p>
 <p>Hillary Barron</p>	<ul style="list-style-type: none"> • Major: Landscape Architecture • Activities: UK Landscape Architecture Association Secretary, UK Club Volleyball • Hobbies and Interests: Design, Camping, Animals, Home improvement projects 	<p>Cincinnati, OH</p>
 <p>Hanna Burgin</p>	<ul style="list-style-type: none"> • Major: Agricultural Biotechnology • Activities: Ag Student Council, Alpha Zeta, Pre-Pharmacy Club, Block and Bridle • Hobbies and Interests: Barrel Racing, spending time with family and friends, volunteering 	<p>Chaplin, KY</p>
 <p>Lacey Roe</p>	<ul style="list-style-type: none"> • Major: Agricultural Education • Activities: CERES sorority, Block and Bridle • Hobbies and Interests: Showing goats, sheep, and hogs 	<p>Paris, KY</p>

 <p>Carrie Butts</p>	<ul style="list-style-type: none"> • Major: Horticulture, Plant and Soil Science • Activities: Ag Student Council, Alpha Zeta, Golden Opportunity Scholar • Hobbies and Interests: Reading, Being outdoors, Spending time with family and friends 	<p>Princeton, KY</p>
 <p>Megan Tennison</p>	<ul style="list-style-type: none"> • Major: Animal Science • Activities: Block and Bridle, Pre-Vet Club • Hobbies and Interests: Spending time with friends and family, Campus activities 	<p>Valencia, CA</p>
 <p>Shelby Clifford</p>	<p>Major: Agricultural Education</p> <ul style="list-style-type: none"> • Activities: Ag Student Council, Ag Ed Society, Kentucky Hereford Association • Hobbies and Interests: showing cattle, hanging out with family, and being an Ambassador 	<p>Cynthiana, KY</p>
 <p>Cody Jenkins</p>	<ul style="list-style-type: none"> • Major: Agricultural Economics/ Public Service and Leadership • Activities: Ag Student Council, Beta Theta Pi fraternity, Upward Basketball • Hobbies and Interests: Sports, Being Outdoors, UK athletics, Spending time with friends and family 	<p>Greenville, KY</p>
 <p>Leslie Hammond</p>	<ul style="list-style-type: none"> • Major: Sustainable Agriculture • Activities: UK Soil Judging Team, promoting food security • Hobbies and Interests: Cooking, being outdoors, Playing with my dog, being with my family 	<p>Stamping Ground, KY</p>
 <p>Amanda Conley</p>	<ul style="list-style-type: none"> • Major: Agricultural Economics • Activities: Ag Student Council, Agribusiness Club, Block and Bridle, Kentucky Junior Cattleman's Association • Hobbies and Interests: working on the farm, showing cows, cooking, and spending time with my friends and family 	<p>Georgetown, KY</p>

 <p>Marissa Kruthaup</p>	<ul style="list-style-type: none"> • Major: Sustainable Agriculture • Activities: Block and Bridle, UK Women's Choir, Alpha Phi Omega, Student Sustainability Council Representative • Hobbies and Interests: Reading, Singing, Farming, Dancing, and spending time with my family and friends 	<p>Morrow, OH</p>
 <p>Stacy McGill</p>	<ul style="list-style-type: none"> • Major: Agricultural Biotechnology • Activities: Writing Center Peer Tutor, MAPS Tutor, Honors Program Mentor • Hobbies and Interests: Reading, Training and Showing Horses, Being Outside 	<p>Harrodsburg, KY</p>
 <p>Jennifer Cox</p>	<ul style="list-style-type: none"> • Major: Agricultural Economics • Activities: Block and Bridle, STAT, Agribusiness Club, Ag Student Council • Hobbies and Interests: Raising and Showing Cattle, Volunteering, Reading, Cooking, Spending time with friends and family 	<p>Coatesville, IN</p>
 <p>Tatum Dale</p>	<ul style="list-style-type: none"> • Major: Public Service and Leadership • Activities: Calvary Baptist Church, UK Baptist Campus Ministries, Alpha Phi sorority • Hobbies and Interests: Music, Sports, Outdoors 	<p>Murray, KY</p>
 <p>Meredith Cinnamon</p>	<ul style="list-style-type: none"> • Major: Merchandising, Apparel, & Textiles/Family Consumer Science Education • Activities: UK 101 Peer Instructor, Merchandising, Apparel & Textiles Club, Educators of Family and Consumer Sciences, UK Official Plaid Board • Hobbies and Interests: UK Basketball, Spending time with friends and family 	<p>Salvisa, KY</p>
 <p>Kellie Owen</p>	<ul style="list-style-type: none"> • Major: Agricultural Economics • Activities: Ag Student Council, Block and Bridle, UK Resident Advisor • Hobbies and Interests: UK Sports, playing guitar, working on the farm, and spending time at the lake 	<p>Magnolia, KY</p>

 <p>Gabe Jones</p>	<ul style="list-style-type: none"> • Major: Human Nutrition/ Pre-Dentistry • Activities: Ag Ambassadors, • Hobbies and Interests: Golf, Music, Hanging out with friends 	<p>Frankfort, KY</p>
 <p>Simone Heath</p>	<ul style="list-style-type: none"> • Major: Landscape Architecture • Activities: Agricultural Information Center, College of Agriculture activities • Hobbies and Interests: UK sporting events, Intramural sports 	<p>Atlanta, GA</p>
 <p>Zeb Vance</p>	<ul style="list-style-type: none"> • Major: Biosystems Engineering • Activities: Resident Advisor, American Society of Agricultural and Biological Engineers Student Branch • Hobbies and Interests: Meteorology, UK football 	<p>Pineville, KY</p>

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UK Food Science Club Club Officers

Food Science

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- Club By-Laws
- Officers
- Members & Resumes
- Calendar
- College Bowl
- Product Development
- Photos
- IFT Links
- Scholarships

President:	Rebecca Delles
Vice President:	Hayriye Cetin-Karaca
Secretary:	Danielle Smothers
Treasurer:	Brittney Flues
Webmaster:	Mahesh Nair
Event Coordinator:	Leeann Slaughters
Outreach Coordinator:	Jamie Greene
Agriculture Counsel	Jing Zhao
Liaison:	
 Faculty Advisors:	
	Surendranath
	Suman
	Gregg Rentfrow

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Last Updated: Tuesday, May 31, 2011

Food Science Program Survey 2009

Report Index	Delete Respondent	View By Respondent ▾
Section 1 - Quality of specific components of the Food Science program	Go	
Has your undergraduate degree in Food Science from the University of Kentucky helped you obtain employment?	Go	
Please indicate your satisfaction with the following aspects of the undergraduate Food Science program at the University of Kentucky.	Go	
If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 3 above, please state your reason and/or suggest what should be changed/improved.	Go	
Please indicate the extent to which your undergraduate education at the University of Kentucky prepared you in the following areas.	Go	
If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 5 above, please state your reason and/or suggest what should be changed/improved.	Go	
Food Chemistry, Analysis and Microbiology	Go	
If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 7 above, please state your reason and/or suggest what should be changed/improved.	Go	
Food Processing and Engineering	Go	
If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 9 above, please state your reason and/or suggest what should be changed/improved.	Go	
Section 2 - Comments	Go	
What aspects of your undergraduate training at the University of Kentucky best prepared you for your current position.	Go	
What aspects of your undergraduate training at the University of Kentucky could be improved (or included) to better prepared you for your current position.	Go	
Any other comments regarding the Food Science program at the University of Kentucky.	Go	

Section 1 - Quality of specific components of the Food Science program

[▲ Top](#)

Has your undergraduate degree in Food Science from the University of Kentucky helped you obtain employment?		Response percent	Response total
Yes		85.71%	<u>6</u>
No		14.29%	<u>1</u>
View	Comments		<u>3</u>

Total # of respondents **7**.
 Statistics based on **7** respondents; **0** filtered; **0** skipped.

[Export Graph](#) [▲ Top](#)

Please indicate your satisfaction with the following aspects of the undergraduate Food Science program at the University of Kentucky.

	Definitely not 1.	2.	Neutral 3.	4.	Definitely 5.	Definitely not 1. 2. Neutral 3.	Response total

						4. Definitely 5.	
I am satisfied with the education I received	0.00% (0)	0.00% (0)	28.57% (2)	28.57% (2)	42.86% (3)		7
As a student, I had adequate access to faculty (course instructors)	0.00% (0)	0.00% (0)	0.00% (0)	42.86% (3)	57.14% (4)		7
My food science education provided me with a broad background in food science	0.00% (0)	14.29% (1)	14.29% (1)	14.29% (1)	57.14% (4)		7
Student suggestions to improve the food science program were taken seriously	14.29% (1)	0.00% (0)	42.86% (3)	0.00% (0)	42.86% (3)		7
My food science advisor was available when I needed him/her	0.00% (0)	14.29% (1)	14.29% (1)	28.57% (2)	42.86% (3)		7
My advisor provided valuable academic and career guidance	14.29% (1)	14.29% (1)	14.29% (1)	28.57% (2)	28.57% (2)		7
Opportunities to participate in a variety of extracurricular activities were provided.	0.00% (0)	28.57% (2)	14.29% (1)	28.57% (2)	28.57% (2)		7

Total # of respondents **7**.
 Statistics based on **7** respondents; **0** filtered; **0** skipped.

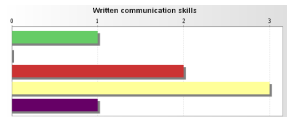
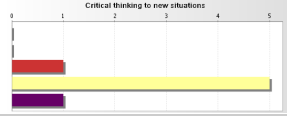
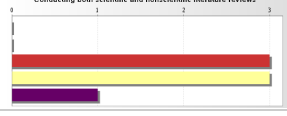
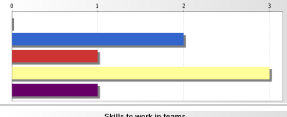
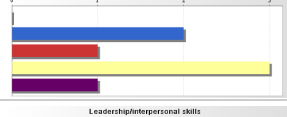
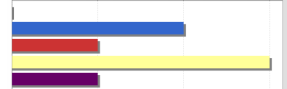
[Export Graph](#) [▲ Top](#)

If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 3 above, please state your reason and/or suggest what should be changed/improved.		Response total
View		0

Total # of respondents **7**.
 Statistics based on **0** respondents; **0** filtered; **7** skipped.

[▲ Top](#)

Please indicate the extent to which your undergraduate education at the University of Kentucky prepared you in the following areas.							
	Not prepared 1.	2.	Adequately prepared 3.	4.	Strongly prepared 5.	Not prepared 1. 2. Adequately prepared 3. 4. Strongly prepared 5.	Response total
Oral communication skills	14.29% (1)	0.00% (0)	14.29% (1)	57.14% (4)	14.29% (1)		7

Written communication skills	14.29% (1)	0.00% (0)	28.57% (2)	42.86% (3)	14.29% (1)		7
Critical thinking to new situations	0.00% (0)	0.00% (0)	14.29% (1)	71.43% (5)	14.29% (1)		7
Conducting both scientific and nonscientific literature reviews	0.00% (0)	0.00% (0)	42.86% (3)	42.86% (3)	14.29% (1)		7
Manage time effectively	0.00% (0)	28.57% (2)	14.29% (1)	42.86% (3)	14.29% (1)		7
Skills to work in teams	0.00% (0)	28.57% (2)	14.29% (1)	42.86% (3)	14.29% (1)		7
Leadership/interpersonal skills	0.00% (0)	28.57% (2)	14.29% (1)	42.86% (3)	14.29% (1)		7

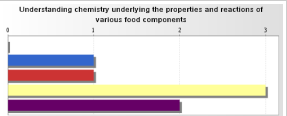
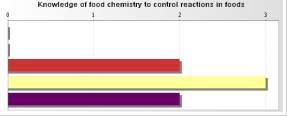
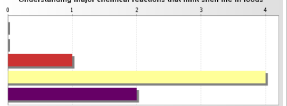
Statistics based on 7 respondents; 0 filtered; 0 skipped. Total # of respondents 7.

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If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 5 above, please state your reason and/or suggest what should be changed/improved.	Response total
View	0

Statistics based on 0 respondents; 0 filtered; 7 skipped. Total # of respondents 7.

[▲ Top](#)

Food Chemistry, Analysis and Microbiology																																
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Not prepared 1.																																
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Understanding chemistry underlying the properties and reactions of various food components	0.00% (0)	14.29% (1)	14.29% (1)	42.86% (3)	28.57% (2)		7																									
Knowledge of food chemistry to control reactions in foods	0.00% (0)	0.00% (0)	28.57% (2)	42.86% (3)	28.57% (2)		7																									
Understanding major chemical reactions that limit shelf life in foods	0.00% (0)	0.00% (0)	14.29% (1)	57.14% (4)	28.57% (2)		7																									

Laboratory techniques common to basic and applied food analyses	0.00% (0)	0.00% (0)	14.29% (1)	57.14% (4)	28.57% (2)		7
Principles behind analytical techniques associated with foods	0.00% (0)	0.00% (0)	28.57% (2)	42.86% (3)	28.57% (2)		7
Application of principles of food science in practical, real world, situations and problems	0.00% (0)	14.29% (1)	14.29% (1)	42.86% (3)	28.57% (2)		7
Food Safety and Microbiology	0.00% (0)	0.00% (0)	0.00% (0)	57.14% (4)	42.86% (3)		7
Identification of important pathogens and spoilage microorganisms in food and the conditions under which they will grow	0.00% (0)	0.00% (0)	14.29% (1)	57.14% (4)	28.57% (2)		7
Conditions under which pathogens are commonly inactivated or made harmless in foods	0.00% (0)	0.00% (0)	14.29% (1)	42.86% (3)	42.86% (3)		7
Utilization of laboratory techniques to identify microorganisms in foods	0.00% (0)	0.00% (0)	14.29% (1)	42.86% (3)	42.86% (3)		7
Application of principles involved in foods preservation via fermentation processes	0.00% (0)	0.00% (0)	14.29% (1)	42.86% (3)	42.86% (3)		7

Statistics based on 7 respondents; 0 filtered; 0 skipped.

Total # of respondents 7.

[Export Graph](#) [▲ Top](#)

If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 7 above, please state your reason and/or suggest what should be changed/improved.	Response total
View	0

Statistics based on 0 respondents; 0 filtered; 7 skipped.

Total # of respondents 7.

[▲ Top](#)

Food Processing and Engineering							
	Not prepared 1.	2.	Adequately prepared 3.	4.	Strongly prepared 5.		Response total
Understanding of and application of methods to control deterioration and spoilage	0.00% (0)	0.00% (0)	14.29% (1)	42.86% (3)	42.86% (3)		7

Principles that make a food product safe for consumption	0.00% (0)	0.00% (0)	0.00% (0)	57.14% (4)	42.86% (3)		7
Energy and heat transfer applications in food processing systems	0.00% (0)	0.00% (0)	14.29% (1)	42.86% (3)	42.86% (3)		7
Basics of fluid flow processes	0.00% (0)	0.00% (0)	42.86% (3)	14.29% (1)	42.86% (3)		7
Basic principles and practices of cleaning and sanitation in food processing operations	0.00% (0)	16.67% (1)	33.33% (2)	0.00% (0)	50.00% (3)		6
Applications of principles of food science to control and assure the quality of food products	0.00% (0)	0.00% (0)	42.86% (3)	14.29% (1)	42.86% (3)		7
Identification of source and variability of raw food materials and their impact on food processing operations	0.00% (0)	14.29% (1)	14.29% (1)	28.57% (2)	42.86% (3)		7
Psychrometrics and applications in drying, evaporation and air conditioning	0.00% (0)	14.29% (1)	14.29% (1)	28.57% (2)	42.86% (3)		7
Properties and use of various packaging materials	0.00% (0)	14.29% (1)	14.29% (1)	42.86% (3)	28.57% (2)		7

Total # of respondents **7**.
 Statistics based on **7** respondents; **0** filtered; **0** skipped.

[Export Graph](#) [▲ Top](#)

If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 9 above, please state your reason and/or suggest what should be changed/improved.	Response total
View	0

Total # of respondents **7**.
 Statistics based on **0** respondents; **0** filtered; **7** skipped.

[▲ Top](#)

Section 2 - Comments

[▲ Top](#)

What aspects of your undergraduate training at the University of Kentucky best prepared you for your current position.	Response total
View	5

Total # of respondents **7**.

Statistics based on **5** respondents; **0** filtered; **2** skipped.

[▲ Top](#)

What aspects of your undergraduate training at the University of Kentucky could be improved (or included) to better prepared you for your current position.		Response total
View		5

Total # of respondents **7**.

Statistics based on **5** respondents; **0** filtered; **2** skipped.

[▲ Top](#)

Any other comments regarding the Food Science program at the University of Kentucky.		Response total
View		5

Total # of respondents **7**.

Statistics based on **5** respondents; **0** filtered; **2** skipped.

[▲ Top](#)

What aspects of your undergraduate training at the University of Kentucky best prepared you for your current position.

Responses

(5 total)

- 1 I obtained a degree. I was able to apply the skills i learned in the program in order to become successful in the food industry

- 2 The food safety knowledge I gained was more than adequate. Having a general understanding of all aspects in the feild has made interviewing easier and adapting to new jobs easier as well.

- 4 The degree related classes and material were right on the mark. I left the university with the knowledge and the confidence to contribute daily at work.

- 5 Food Fermentation class

- 6 A lot of the broad spectrum Food Science information. Just having worked with some lab equipment before. Being familiar with terms.

(5 total)

What aspects of your undergraduate training at the University of Kentucky could be improved (or included) to better prepared you for your current position.

Responses

(5 total)

- 1 less focus on R&D. More preparation for a food production facility, how they operate, common issues...more trips to a production facility...QA.. what is QA?...I was once assigned to write a paper in an english class about "what is food science"... it was one of the hardest papers i had to write because i didnt understand the whole realm of what it was.
-
- 2 A more developed understanding of different ingredients used in product development could have been offered. Perhaps a course in just additives and food ingredients would have made the transition into the R&D sector a little easier. Although there was some material covered in the product development class, I believe a class that spends more time focusing on individual types of raw materials and ingredients would be very beneficial. There are lots of common raw materials that I have had to learn about on the job that I dont remember being covered in depth enough in class.
-
- 4 I took business writing at LCC. I also took this class at UK since LCC did not satisfy the tier 2 writing requirement. The difference in the material was staggering. I got so much more out of the course at LCC; I was appalled. We went over resumes, email strategies, reports and general business expectations. The focus in the UK version seemed to be working in groups. We did most of our classes in the library researching papers in these groups. I did 4 or 5 real papers that semester, which I could have done in high school. The teacher gave even more remedial lectures on grammar. The classwork was a joke. I felt like this class was more than a waste of my time, it was an insult to me as a UK student.
-
- 5 I was fully prepared
-
- 6 UK seems to have a lot of professors who are focused on dairy and meat/protein. I feel like I was not exposed to much outside of that (in-depth). Perhaps more exposure to other types of products (such as baked goods/sweets/flavors and etc) would help. Also, more "real-world" application would be a tremendous help.
-

(5 total)

Any other comments regarding the Food Science program at the University of Kentucky.

Responses

(5 total)

2 I am very pleased with my degree from UK's food science department. I miss the people and program dearly. I have had issues finding a steady job, but this is more to blame on the sagging economy than the education I received at UK. I would also encourage undergrads to try and obtain as much experience as possible before trying to find work. Do as many internships as possible as the job market is very tough and caters to experience more than anything. It seems a degree isn't as important as what you have done towards/with it. I have had to take time and work some contract positions to gain the experience needed to get into a better paying more appropriate position.

4 I thought this was a good program.

5 It is a wonderful program with awesome advisors. I wouldn't have changed a thing!

6 I think the faculty needs to help students more with acquiring jobs upon graduation. Any time I asked for help, I was given a neutral "keep looking" response. Yes, I know to keep looking, and I'm going to do that. But it would help if you would throw some opportunities my way as well. Especially with the economy down and all I heard for 4 years was "You'll have a job as soon as you graduate" and "Don't accept less than 50K a year". Well, neither of those was true. The College of Agriculture has the career center, but they have no clue what Food Science is, much less what you would do with it. The program needs to not just "drop" its students as soon as they graduate.

7 If I had to do all over again, I would NOT have gone through the Food Science course at UK, because I felt the program was loosely thrown together and the university as a whole doesn't care whether or not this program exists and the funding proves this to be true. I am dissatisfied particularly with the sensory lab, and every lab for that matter. The "kitchen" was outdated, extremely small, and ill-equipped for the students to work in. The instructors, whom are good people, seemed aggravated with the UK system as well...I don't know, I feel the amount of the loans that I had to take out for this degree has outweighed the worth of my "undergraduate training" by far.

(5 total)

UK Food Science Program Alumni Survey 2011

Report Index	Delete Respondent	View By Respondent ▾
Section 1 - Quality of specific components of the Food Science program	Go	
Has your Food Science education from the University of Kentucky helped you obtain employment (or a position working toward an advanced degree) ?	Go	
Please indicate your satisfaction with the following aspects of the undergraduate Food Science program at the University of Kentucky.	Go	
If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 3 above, please state your reason and/or suggest what should be changed/improved.	Go	
Please indicate the extent to which your undergraduate education at the University of Kentucky prepared you in the following areas.	Go	
If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in the question above, please state your reason and/or suggest what should be changed/improved.	Go	
Food Chemistry, Analysis and Microbiology	Go	
If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 7 above, please state your reason and/or suggest what should be changed/improved.	Go	
Food Processing and Engineering	Go	
If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 9 above, please state your reason and/or suggest what should be changed/improved.	Go	
Section 2 - Comments	Go	
What aspects of your undergraduate training at the University of Kentucky best prepared you for your current position.	Go	
What aspects of your undergraduate training at the University of Kentucky could be improved (or included) to better prepared you for your current position.	Go	
Any other comments regarding the Food Science program at the University of Kentucky.	Go	

Section 1 - Quality of specific components of the Food Science program

[▲ Top](#)

Has your Food Science education from the University of Kentucky helped you obtain employment (or a position working toward an advanced degree) ?			Response percent	Response total
Yes			100%	4
No			0%	0
View	Comments			2

Total # of respondents **4**.
 Statistics based on **4** respondents; **0** filtered; **0** skipped.

[Export Graph](#)

[▲ Top](#)

Please indicate your satisfaction with the following aspects of the undergraduate Food Science program at the University of Kentucky.

	Definitely not 1.	2.	Neutral 3.	4.	Definitely 5.	Definitely not 1. 2.	Response total

						Neutral 3. 4. Definitely 5.	
I am satisfied with the education I received	0.00% (0)	0.00% (0)	0.00% (0)	25.00% (1)	75.00% (3)		4
As a student, I had adequate access to faculty (course instructors)	0.00% (0)	0.00% (0)	0.00% (0)	25.00% (1)	75.00% (3)		4
My food science education provided me with a broad background in food science	0.00% (0)	0.00% (0)	0.00% (0)	25.00% (1)	75.00% (3)		4
Student suggestions to improve the food science program were taken seriously	0.00% (0)	0.00% (0)	50.00% (2)	0.00% (0)	50.00% (2)		4
My food science advisor was available when I needed him/her	0.00% (0)	0.00% (0)	0.00% (0)	25.00% (1)	75.00% (3)		4
My advisor provided valuable academic and career guidance	0.00% (0)	0.00% (0)	25.00% (1)	0.00% (0)	75.00% (3)		4
Opportunities to participate in a variety of extracurricular activities were provided.	0.00% (0)	0.00% (0)	0.00% (0)	25.00% (1)	75.00% (3)		4

Statistics based on 4 respondents; Total # of respondents 4. 0 filtered; 0 skipped.


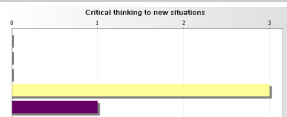
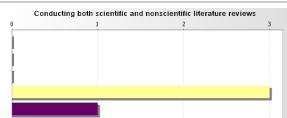
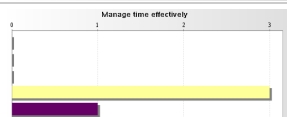
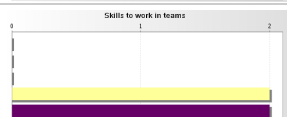
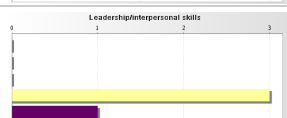
[Export Graph](#) [▲ Top](#)

If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 3 above, please state your reason and/or suggest what should be changed/improved.		Response total
View		0

Statistics based on 0 respondents; Total # of respondents 4. 0 filtered; 4 skipped.

[▲ Top](#)

Please indicate the extent to which your undergraduate education at the University of Kentucky prepared you in the following areas.							Response total
	Not prepared 1.	2.	Adequately prepared 3.	4.	Strongly prepared 5.	Not prepared 1. 2. Adequately prepared 3. 4. Strongly prepared 5.	
Oral communication skills	0.00% (0)	0.00% (0)	0.00% (0)	100.00% (4)	0.00% (0)		4

Written communication skills	0.00% (0)	0.00% (0)	0.00% (0)	50.00% (2)	50.00% (2)		4
Critical thinking to new situations	0.00% (0)	0.00% (0)	0.00% (0)	75.00% (3)	25.00% (1)		4
Conducting both scientific and nonscientific literature reviews	0.00% (0)	0.00% (0)	0.00% (0)	75.00% (3)	25.00% (1)		4
Manage time effectively	0.00% (0)	0.00% (0)	0.00% (0)	75.00% (3)	25.00% (1)		4
Skills to work in teams	0.00% (0)	0.00% (0)	0.00% (0)	50.00% (2)	50.00% (2)		4
Leadership/interpersonal skills	0.00% (0)	0.00% (0)	0.00% (0)	75.00% (3)	25.00% (1)		4

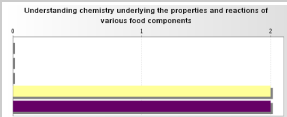
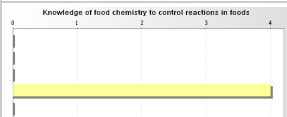
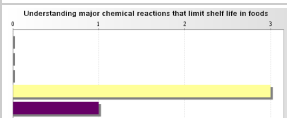
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[▲ Top](#)

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Utilization of laboratory techniques to identify microorganisms in foods	0.00% (0)	0.00% (0)	0.00% (0)	50.00% (2)	50.00% (2)		4
Application of principles involved in foods preservation via fermentation processes	0.00% (0)	0.00% (0)	0.00% (0)	25.00% (1)	75.00% (3)		4

Total # of respondents 4.

Statistics based on 4 respondents; 0 filtered; 0 skipped.

[Export Graph](#) [▲ Top](#)

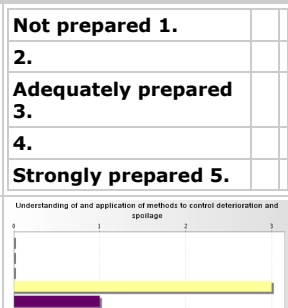
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View		Response total
		0

Total # of respondents 4.

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[▲ Top](#)

Food Processing and Engineering																											
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4.																											
Strongly prepared 5.																											
Understanding of and application of methods to control deterioration and spoilage	0.00% (0)	0.00% (0)	0.00% (0)	75.00% (3)	25.00% (1)		4																				

Principles that make a food product safe for consumption	0.00% (0)	0.00% (0)	0.00% (0)	50.00% (2)	50.00% (2)		4
Energy and heat transfer applications in food processing systems	0.00% (0)	0.00% (0)	50.00% (2)	25.00% (1)	25.00% (1)		4
Basics of fluid flow processes	0.00% (0)	0.00% (0)	25.00% (1)	75.00% (3)	0.00% (0)		4
Basic principles and practices of cleaning and sanitation in food processing operations	0.00% (0)	0.00% (0)	0.00% (0)	100.00% (4)	0.00% (0)		4
Applications of principles of food science to control and assure the quality of food products	0.00% (0)	0.00% (0)	0.00% (0)	100.00% (4)	0.00% (0)		4
Identification of source and variability of raw food materials and their impact on food processing operations	0.00% (0)	0.00% (0)	0.00% (0)	100.00% (4)	0.00% (0)		4
Psychrometrics and applications in drying, evaporation and air conditioning	0.00% (0)	0.00% (0)	75.00% (3)	25.00% (1)	0.00% (0)		4
Properties and use of various packaging materials	0.00% (0)	0.00% (0)	25.00% (1)	50.00% (2)	25.00% (1)		4

Statistics based on 4 respondents; 0 filtered; 0 skipped. Total # of respondents 4.

[Export Graph](#) [▲ Top](#)

If you selected either column 1 or 2 (indicating dissatisfaction) for an item(s) in question 9 above, please state your reason and/or suggest what should be changed/improved.	Response total
View	0

Statistics based on 0 respondents; 0 filtered; 4 skipped. Total # of respondents 4.

[▲ Top](#)

Section 2 - Comments
▲ Top

What aspects of your undergraduate training at the University of Kentucky best prepared you for your current position.	Response total
View	3

Total # of respondents **4**.

Statistics based on **3** respondents; **0** filtered; **1** skipped.

[▲ Top](#)

What aspects of your undergraduate training at the University of Kentucky could be improved (or included) to better prepared you for your current position.		Response total
View		3

Total # of respondents **4**.

Statistics based on **3** respondents; **0** filtered; **1** skipped.

[▲ Top](#)

Any other comments regarding the Food Science program at the University of Kentucky.		Response total
View		2

Total # of respondents **4**.

Statistics based on **2** respondents; **0** filtered; **2** skipped.

[▲ Top](#)

What aspects of your undergraduate training at the University of Kentucky best prepared you for your current position.

Responses

(3 total)

- 1 Any hands on lab work taught me technique can be everything.

- 2 I do a lot of product sensory testing at my job. Having the knowledge and the science behind sensory helps me better understand what is going on and how I can make it better.

- 3 A broad spectrum that introduced and prepared me for the food industry.

(3 total)

What aspects of your undergraduate training at the University of Kentucky could be improved (or included) to better prepared you for your current position.

Responses

(3 total)

- 1 Nothing for my current position.

- 2 I definately wish the facilities were more up to date. I remember the different equiptment would sometimes not work or would not be accessible. I know it is nothing that the department can help with. I am sure they would love to have working equiptment to better teach their students.

- 3 I came straight out of school and was placed in a job. I had a broad spectrum of knowledge that I had picked up here and there, but I never realized how much I would actually need the knowledge that the professors were trying to teach me. WHile i was learning in the classroom setting, it was hard for me to rationalize how I would ever use all the knowledge they were trying to give to me----So I wish there would have been more of a direct correlation as to how i would apply the knowledge once i was in the career setting.

(3 total)

Any other comments regarding the Food Science program at the University of Kentucky.

Responses

(2 total)

1 Great professors- I feel I received the best education because of them!

2 I have only been graduated for about a year now. Not a day goes by that I don't think back to a particular class or lesson and use it that day at work. I love the passion of the teachers and closeness of the department. I always could come to any professor or graduate student and ask for help. My professors and advisors had faith in me even when I didn't! Thank You!

(2 total)

Internship Program LEARNING CONTRACT

1. Please complete this contract with your faculty advisor.
2. Complete contracts must include student signature, faculty sponsor, and department chair approval. (Associate Dean Approval is no longer required for Departmental Internship Courses)
3. Upon completion with department approval, submit your complete contract to N8 Advising Resource Center for registration into your internship course.

Questions? Contact [Amanda Saha](mailto:Amanda.Saha@uky.edu), Director Career Development & Academic Enrichment
Amanda.saha@uky.edu or 859-257-3468

Student Information

Student Name:
E-mail:
Phone:
Address:
City/ST/Zip
Major:
College:
Class Level:
Student Number (*not SSN*):

Course Information

Semester/Year:
Course:
Credit Hours:

Internship Partner Information

Organization/Company Name:
Supervisor's Name:
E-mail:
Phone:
Address
City/ST/Zip:

Hours

Starting Date:
Ending Date:
Total Number of Weeks:
Average Hours Per Week:
Total Hours Worked:

Describe the duties of your internship:

List your learning objectives for this experience:

(What do you expect to learn from this experience? Objectives should be measurable and achievable.)

Specify the assignments agreed upon with your faculty sponsor:

(Assignments are usually reflective in nature.)

Specify dates and times you have agreed to meet with your faculty sponsor for critical reflection:

(Dates/times may be specific or in general terms. "To Be Determined" is not acceptable.)

Faculty Sponsor:

Department:

Campus Address:

Phone:

E-mail:

Department / Program Chair or Coordinator:

Department:

Campus Address:

Faculty Sponsor Signature

Date

Department / Program Signature

Date

(Internship Coordinator or Chair)

Student Signature

Date

Block 1

University of Kentucky Food Science Internship Evaluation
for [REDACTED] Internship at Chick-fil-A 2013

Instructions to Employer: Please assess the work performance of the student based on the characteristics and attributes listed by checking the appropriate box under each category.

This form should be completed by the individual who has supervised the student's work assignments. When the completed is submitted, it will be sent electronically to:

Dr. Clair Hicks
Professor and Director of Undergraduate Studies
410 W.P. Garrigus Building
Lexington, KY 40546-0215
e-mail: chicks@uky.edu

Thank you for your participation and we look forward to working with you in the future!

Skills/Knowledge

SKILLS/KNOWLEDGE

	Outstanding	Good	Average	Below Average	Unsatisfactory
Demonstrates skills needed for assigned tasks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understands expectations of supervisor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communications skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leadership skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Self-Management

Self-Management

	Outstanding	Good	Average	Below Average	Unsatisfactory
Maintains professional manner and appearance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manages time and resources effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Makes informed decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seeks further guidance when appropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sets realistic goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Dependability

Dependability

	Outstanding	Good	Average	Below Average	Unsatisfactory
Job attendance and punctuality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completes projects by specified deadline	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstrates maturity level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Attitude

Attitude

	Outstanding	Good	Average	Below Average	Unsatisfactory
Is flexible and willing to learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstrates initiative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accepts and makes constructive use of criticism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is courteous and friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interested in assigned work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Relationships

Relationships

	Outstanding	Good	Average	Below Average	Unsatisfactory
Works effectively with supervisor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Works effectively with co-workers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Works effectively with public / customers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Further Comments

Would you consider this student for future employment?

- Yes
- No

Do you have any further comments, or suggestions as to how we might enhance the Food Science Internship Program to benefit your organization and the experience of the student?

☆ William Boatright <wlboat1@uky.edu>

December 13, 2013 4:53 PM

To: jeromyst@gmail.com

[Hide Details](#)

Cc: Clair Hicks <clhicks@uky.edu>

Internship Evaluation of [REDACTED] at Chick-fil-A



[REDACTED]

As part of the University of Kentucky's Food Science program internship assessment, please complete our online student evaluation form for [REDACTED]. This survey can take as little as 3 minutes, and is an important part his evaluation. Simply click on the link below and complete the survey online:

https://uky.az1.qualtrics.com/SE/?SID=SV_6QqdRaoFIhsyFed

Providing our students with the opportunity to obtain experience working in their chosen field is a valuable part of the students training. We greatly appreciate your involvement and look forward to possibly working with you in the future.

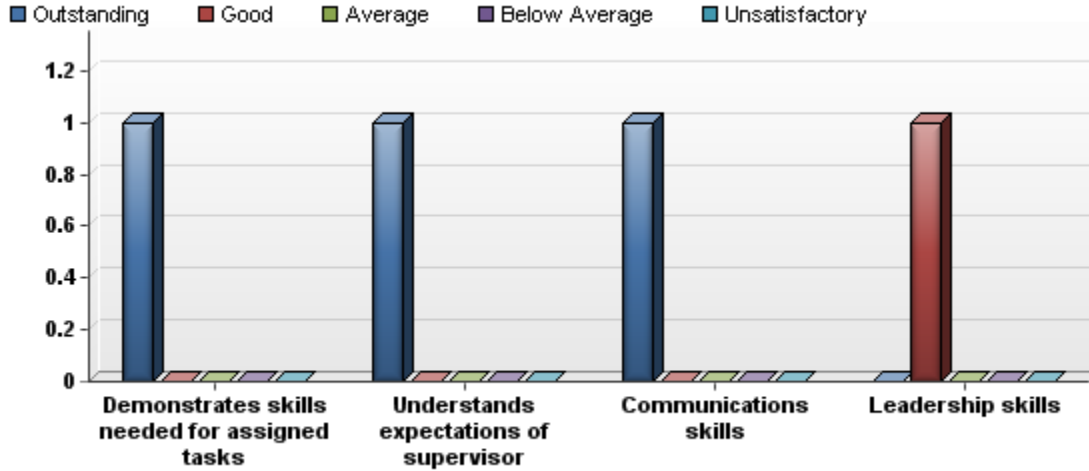
Best regards,

Luke Boatright
Professor
University of Kentucky
412 W.P. Garrigus Building
Lexington, KY 40546-0215
Phone: 859-257-5988

Student Example 2013 Initial Report

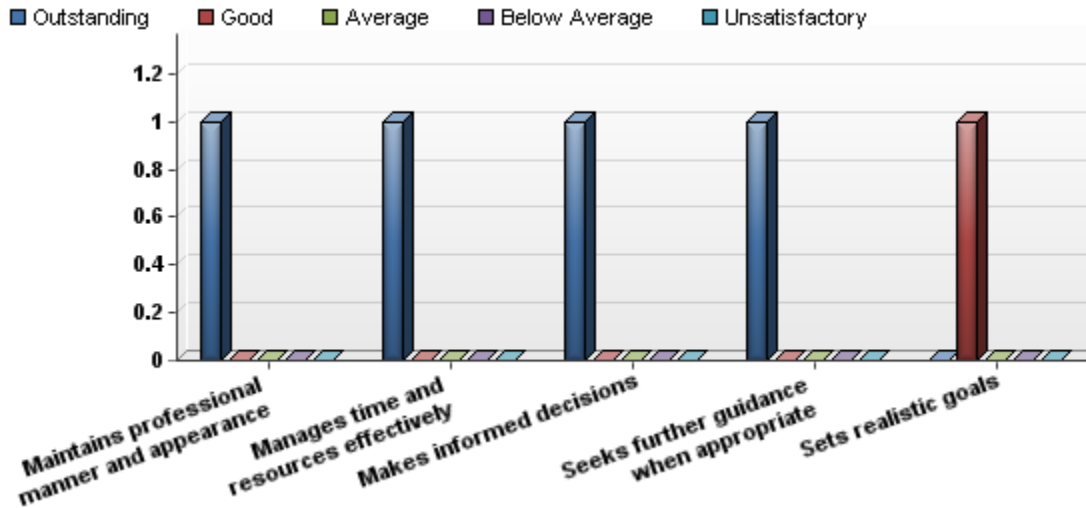
Last Modified: 12/13/2013

1. SKILLS/KNOWLEDGE



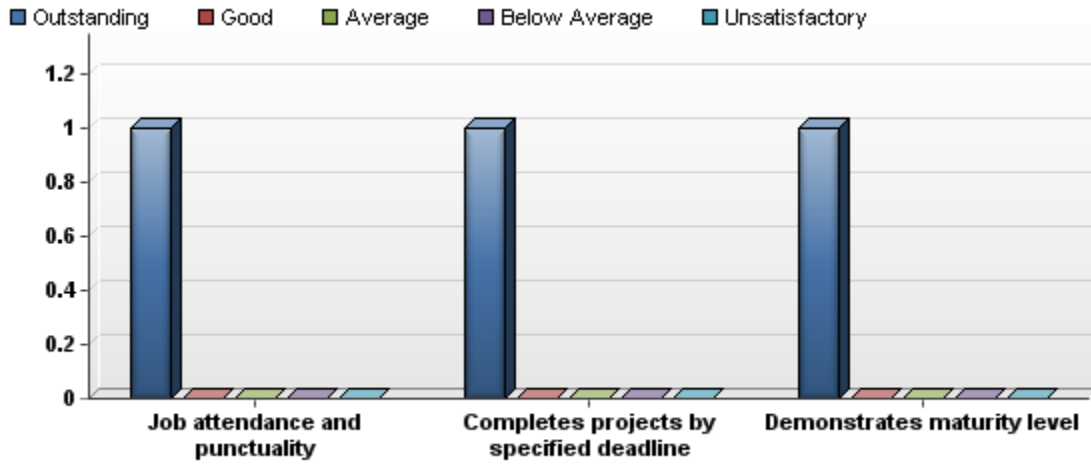
#	Question	Outstanding	Good	Average	Below Average	Unsatisfactory	Total Responses	Mean
1	Demonstrates skills needed for assigned tasks	1	0	0	0	0	1	1.00
2	Understands expectations of supervisor	1	0	0	0	0	1	1.00
3	Communications skills	1	0	0	0	0	1	1.00
4	Leadership skills	0	1	0	0	0	1	2.00

2. Self-Management



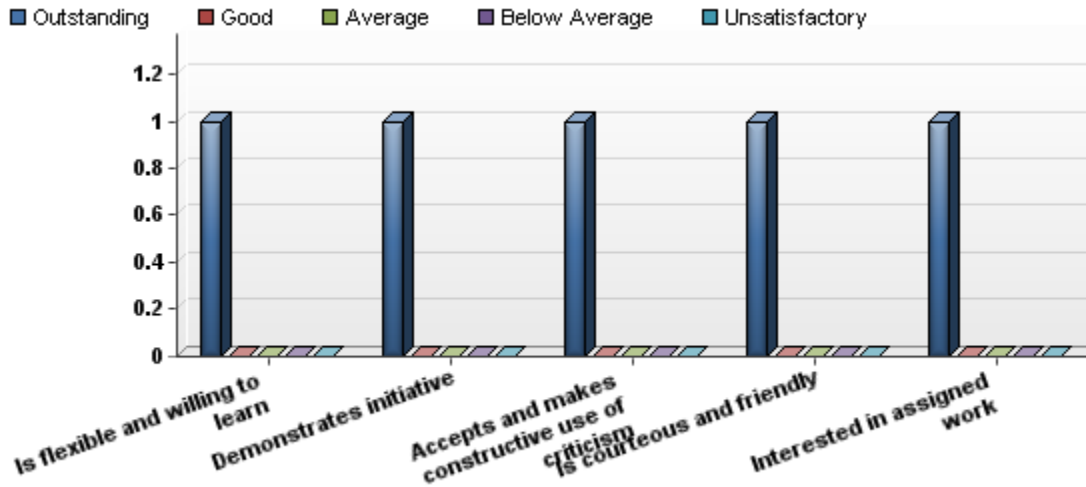
#	Question	Outstanding	Good	Average	Below Average	Unsatisfactory	Total Responses	Mean
1	Maintains professional manner and appearance	1	0	0	0	0	1	1.00
2	Manages time and resources effectively	1	0	0	0	0	1	1.00
3	Makes informed decisions	1	0	0	0	0	1	1.00
4	Seeks further guidance when appropriate	1	0	0	0	0	1	1.00
5	Sets realistic goals	0	1	0	0	0	1	2.00

3. Dependability



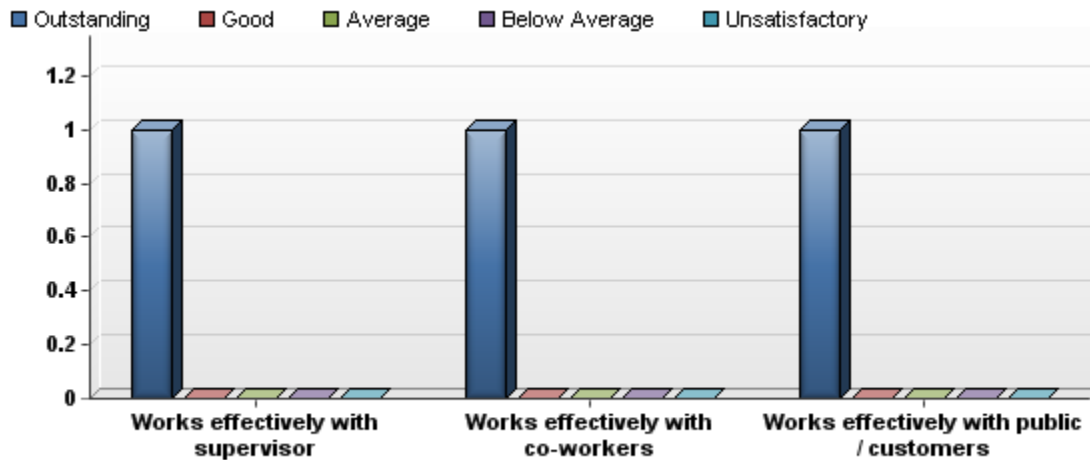
#	Question	Outstanding	Good	Average	Below Average	Unsatisfactory	Total Responses	Mean
1	Job attendance and punctuality	1	0	0	0	0	1	1.00
2	Completes projects by specified deadline	1	0	0	0	0	1	1.00
3	Demonstrates maturity level	1	0	0	0	0	1	1.00

4. Attitude



#	Question	Outstanding	Good	Average	Below Average	Unsatisfactory	Total Responses	Mean
1	Is flexible and willing to learn	1	0	0	0	0	1	1.00
2	Demonstrates initiative	1	0	0	0	0	1	1.00
3	Accepts and makes constructive use of criticism	1	0	0	0	0	1	1.00
4	Is courteous and friendly	1	0	0	0	0	1	1.00
5	Interested in assigned work	1	0	0	0	0	1	1.00

5. Relationships



#	Question	Outstanding	Good	Average	Below Average	Unsatisfactory	Total Responses	Mean
1	Works effectively with supervisor	1	0	0	0	0	1	1.00
2	Works effectively with co-workers	1	0	0	0	0	1	1.00
3	Works effectively with public / customers	1	0	0	0	0	1	1.00

6. Would you consider this student for future employment?

#	Answer	Response	%
1	Yes	1	100%
2	No	0	0%
	Total	1	100%

7. Do you have any further comments, or suggestions as to how we might enhance the Food Science Internship

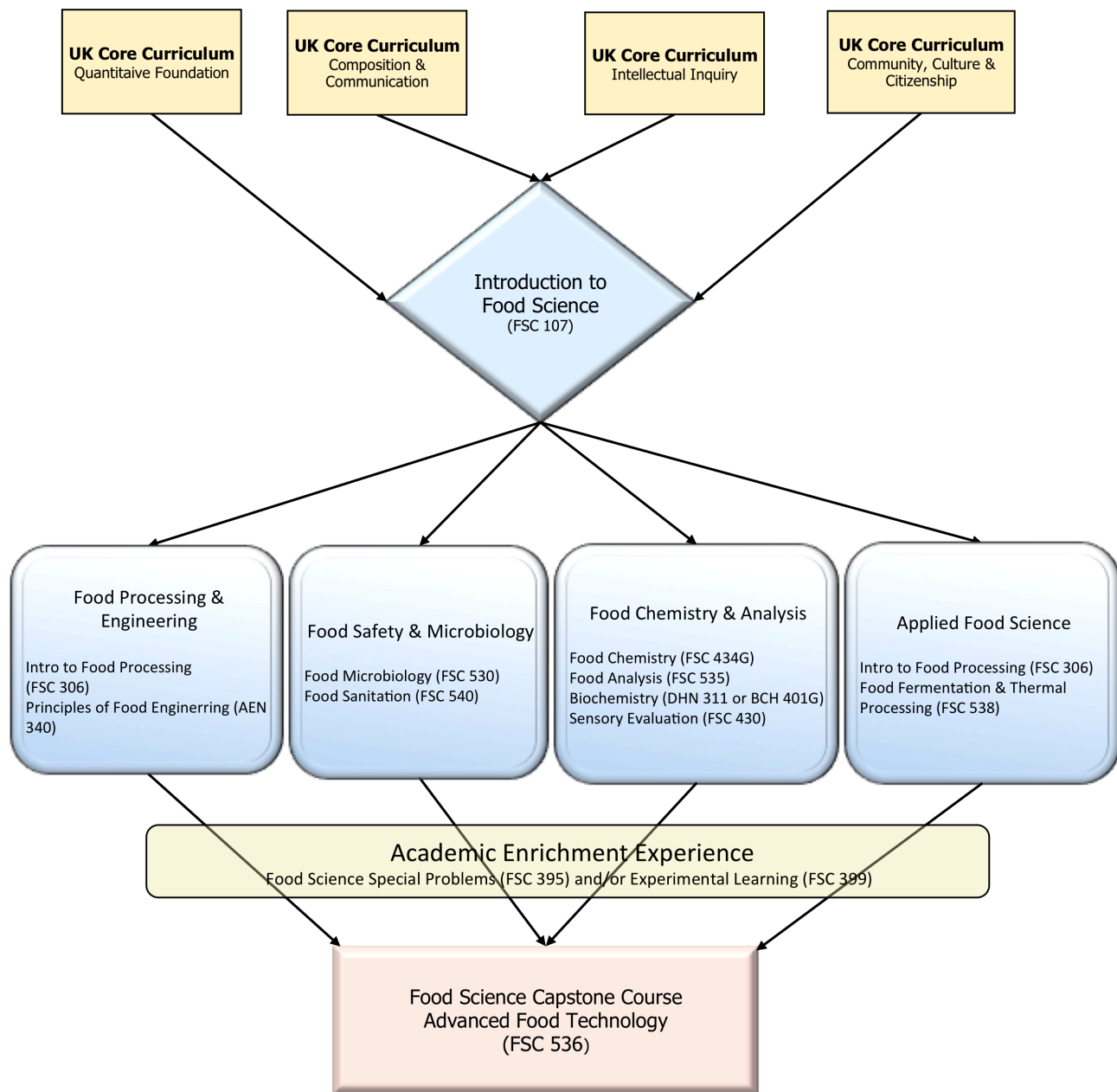
Program to benefit your organization and the experience of the student?

Text Response

Studnet was actually our first Food Science intern. At first we weren't sure if this was something that would be beneficial to us or if we would offer it again in the future, but after going through the experience we would welcome the idea of participating in this program again. It has been a great experience for us and we hope for student as well.

Statistic	Value
Total Responses	1

University of Kentucky Undergraduate Food Science Program Curriculum Map



IFT Core Competenceis Addressed by the University of Kentucky's Food Science Program

Coverage of competency abbreviations I = Introduced C = Covered to some extent D = Covered in detail	Bloom's Taxonomy of Cognitive Domain Abbreviations 1. Knowledge (or recall) 2. Comprehension (or translate) 3. Application (or generalize) 4. Analysis (or breakdown/discover) 5. Synthesis (or compose) 6. Evaluation (or judge)
--	--

	Food Science	FSC 107	FSC 304	FSC 306	AEN 340	FSC 395*	FSC 399*	FSC 430	FSC 434G	FSC 530	FSC 535	FSC 536	FSC 538	FSC 540
	Food Chemistry and Analysis	FSC 107	FSC 304	FSC 306	AEN 340	FSC 395	FSC 399	FSC 430	FSC 434G	FSC 530	FSC 535	FSC 536	FSC 538	FSC 540
1	Know the chemistry underlying the properties and reactions of various food components.	C, 1,2,3	D 1,2,3,4,5,6	C1,2,3			C		D 1,2,3,4,5,6	C1,2,3	D 1,2,3,4,5,6	C1,2,3,4	D 1,2,3,4,5,6	
2	Have sufficient knowledge of food chemistry to control reactions in foods.		I 1,2,3	D1,2,3,4			C		D 1,2,3,4,5,6	C1,2,3	C 1,2,3,4	D1,2,3,4,5	C 1,2,3,4	
3	Know the major chemical reactions that limit shelf life of foods.	C, 1,2,3	D 1,2,3,4,5,6	C1,2,3			C		D 1,2,3,4,5,6	D1,2,3,4,6	C 1,2,3	D1,2,3,4,5	D 1,2,3,4,5,6	C1,2,3
4	Use the laboratory techniques common to basic and applied food chemistry.		I 1,2,3	I1			C		D 1,2,3,4,5,6		D 1,2,3,4,5,6	I1,2		
5	Know the principles behind analytical techniques associated with food.		I 1,2,3	I1			D		I 1,2,3		D 1,2,3,4,5,6	I1,2		
6	Be able to select the appropriate analytical technique when presented with a practical problem.		I 1,2,3	I1			C		C 1,2,3		D 1,2,3,4,5,6	I1,2		
7	Demonstrate practical proficiency in food analysis laboratory.			I1			D		I 1,2,3		D 1,2,3,4,5,6			
	Food Safety and Microbiology	FSC 107	FSC 304	FSC 306	AEN 340	FSC 395	FSC 399	FSC 430	FSC 434G	FSC 530	FSC 535	FSC 536	FSC 538	FSC 540
8	Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they will grow.	C, 1,2,3	C 1,2,3,4	I1,2			D			D1,2,3,4,5,6		I1,2	D 1,2,3,4,5,6	C1,2,3
9	Identify the conditions under which the important pathogens are commonly inactivated, killed or made harmless in foods.	C, 1,2,3	C 1,2,3,4	D1,2,3			D		C 1,2,3	D1,2,3,4,5,6		I1,2	D 1,2,3,4,5,6	D1,2,3,4,5,6
10	Utilize laboratory techniques to identify microorganisms in foods.		I 1,2,3				C			D1,2,3,4,5,6				
11	Know the principles involving food preservation via fermentation processes.	C, 1,2,3	C 1,2,3,4	I1			I		C 1,2,3	D1,2,3,4,5,6		I1,2	D 1,2,3,4,5,6	C1,2,3
12	Know the role and significance of microbial inactivation, adaptation and environmental factors (i.e., aW, pH, temperature) on growth and response of microorganisms in various environments.	C, 1,2,3	I 1,2,3	C1,2,3			D		D 1,2,3,4,5	D1,2,3,4,5,6	C	C1,2,3,4	D 1,2,3,4,5,6	C1,2,3
13	Identify the conditions, including sanitation practices, under which the important pathogens and spoilage microorganisms are commonly inactivated, killed or made harmless in foods.	C, 1,2,3		D1,2,3			D		I 1,2	D1,2,3,4,5,6		C1,2,3,4	D 1,2,3,4,5,6	D1,2,3,4,5,6
	Food Processing and Engineering	FSC 107	FSC 304	FSC 306	AEN 340	FSC 395	FSC 399	FSC 430	FSC 434G	FSC 530	FSC 535	FSC 536	FSC 538	FSC 540
14	Know the source and variability of raw food material and their impact on food processing operations.	C, 1,2,3	D1,2,3,4,5,6	I1			D		C 1,2,3,4	D1,2,3,4,5,6		C1,2,3	D 1,2,3,4,5,6	
15	Know the spoilage and deterioration mechanisms in foods and methods to control deterioration and spoilage.	C, 1,2,3	C 1,2,3,4	D1,2,3	C 1,2,3		D		C 1,2,3,4,5,6	D1,2,3,4,5,6	C 1,2,3	C1,2,3,4	D 1,2,3,4,5,6	
16	Know the principles that make a food product safe for consumption.	C, 1,2,3		C1,2,3					C 1,2,3,4		C 1,2,3	C1,2	D 1,2,3,4,5,6	
17	Know the transport processes and unit operations in food processing as demonstrated both conceptually and in practical laboratory settings.		C 1,2,3,4	D1,2,3	D 1,2,3,4,5,6		D		I 1,2,3		I 1,2	I1,2	C 1,2,3,4,5,6	
18	Be able to use the mass and energy balances for a given food process.			D1,2,3	D 1,2,3,4,5,6		D							
19	Understand the unit operations required to produce a given food product.	C, 1,2,3		D1,2,3,4	D 1,2,3,4,5,6		D		I 1,2,3		I 1,2,3		I	D1,2,3,4,5,6
20	Know the principles and current practices of processing techniques and the effects of processing parameters on product quality.	C, 1,2,3	D	D1,2,3,4	C 1,2,3,4,5,6		D		C 1,2,3,4,5,6		C 1,2,3,4,5,6		D 1,2,3,4,5,6	
21	Know the properties and uses of various packaging materials.		C 1,2,3,4	I1,2			D		C 1,2,3	C		C1,2,3	C	
22	Know the basic principles and practices of cleaning and sanitation in food processing operations.	C, 1,2,3		D1,2,3,4			D		I 1,2	D1,2,3,4,5,6	I 1,2	C1,2	D 1,2,3,4,5,6	D1,2,3,4,5,6
23	Know the requirements for water utilization and waste management in food and food processing.	C, 1,2,3		C1,2,3,4	I 1,2,3		D			I			D 1,2,3,4,5,6	
	Applied Food Science	FSC 107	FSC 304	FSC 306	AEN 340	FSC 395	FSC 399	FSC 430	FSC 434G	FSC 530	FSC 535	FSC 536	FSC 538	FSC 540
24	Be able to apply and incorporate the principles of food science in practical, realworld situations and problems.	C, 1,2,3	I 1,2,3	D1,2,3,4	C 1,2,3	D 1,2,3,4,5,6	D 1,2,3,4,5,6	D1,2,3,4,5,6	D 1,2,3,4,5,6	D1,2,3,4,5,6	D 1,2,3,4,5,6	D1,2,3,4,5	D 1,2,3,4,5,6	D1,2,3,4,5,6
25	Know how to use computers to solve food science problems.			C1,2,3		C	D	I 1,2,3	I 1,2,3,4		I 1,2,3,4	D1,2,3,4,5	D 1,2,3,4,5,6	
26	Be able to apply statistical principles to food science applications.			I1			C	D1,2,3,4,5,6	I 1,2,3		I 1,2,3,4,5	D1,2,3,4		
27	Be able to apply the principles of food science to control and assure the quality of food products.	C, 1,2,3	C 1,2,3,4	D1,2,3,4			C	D1,2,3,4,5,6	D 1,2,3,4,5,6	D1,2,3,4,5,6	C 1,2,3,4	D1,2,3,4,5	D 1,2,3,4,5,6	

28	Know the basic principles of sensory analysis.		C 1,2,3,4	I1			C	D1,2,3,4,5,6	C 1,2,3,4		C 1,2,3	C1,2,3	C	
29	Be aware of current topics of importance to the food industry.	C, 1,2,3	C 1,2,3,4	C1,2		D	D	D1,2,3,4,5,6	C 1,2,3,4,5,6	D1,2,3,4,5,6	C 1,2,3,4,5,6	C1,2,3	I	D1,2,3,4,5,6
30	Know government regulations required for the manufacture and sale of food products.	C, 1,2,3	C 1,2,3,4	C1,2			D	D1,2,3,4,5,6	C 1,2,3,4	D1,2,3,4,5,6	C 1,2,3,4	D1,2,3,4	D 1,2,3,4,5,6	D1,2,3,4,5,6
	Success Skills	FSC 107	FSC 304	FSC 306	AEN 340	FSC 395	FSC 399	FSC 430	FSC 434G	FSC 530	FSC 535	FSC 536	FSC 538	FSC 540
31	Demonstrate the use and practice of different levels of oral and written communication skills. This includes such skills as writing technical reports, letters and memos; communicating technical information to a non-technical audience; and making formal and informal presentations.	C, 1,2,3	D1,2,3,4,5,6	C1,2		D 1,2,3,4,5,6	D 1,2,3,4,5,6	C 1,2,3,4	D 1,2,3,4,5,6	D1,2,3,4,5,6	D 1,2,3,4,5,6	D1,2,3,4,5	I	D1,2,3,4,5,6
32	Be able to develop a process for solving and preventing recurrences of ill-defined problems; know how to use library and internet resources to search for quality information, and solve a problem; and make thoughtful recommendations.			I1		C	C		D 1,2,3,4,5		D 1,2,3,4,5	C1,2,3		
33	Apply critical thinking skills to new situations.		C 1,2,3,4	I1,2	C 1,2,3	D 1,2,3,4,5,6	D 1,2,3,4,5,6	C 1,2,3,4	I 1,2,3,4,5	D1,2,3,4,5,6	I 1,2,3,4,5	D1,2,3,4	D 1,2,3,4,5	D1,2,3,4,5,6
34	Commit to the highest standards of professional integrity and ethical values.	I 1,2,3	C 1,2,3,4	C1,2,3	C 1,2,3	D	D	C 1,2,3,4	D 1,2,3,4,5	C1,2,3	D 1,2,3,4,5	D1,2,3	D 1,2,3,4,5	C1,2,3
35	Work and/or interact with individuals from diverse cultures.	I 1,2,3	I 1,2,3	I1,2			D	D1,2,3,4,5,6	I 1,2,3	I1,2,3,4	I 1,2,3	D1,2,3	I	I 1,2,3
36	Explain the skills necessary to continually educate oneself.		C 1,2,3,4			C 1,2,3,4,5	D		C 1,2,3,4,5	D1,2,3,4,5,6	C 1,2,3,4,5	D1,2,3,4	I	D1,2,3,4,5,6
37	Work effectively with others.	C 1,2,3		I1,2	C 1,2,3		D	D1,2,3,4,5,6	D 1,2,3,4,5	D1,2,3,4,5,6	D 1,2,3,4,5	D1,2,3,4,5	I	D1,2,3,4,5,6
38	Provide leadership in a variety of situations.		I 1,2,3	C1,2			D		I 1,2,3,4	I1,2,3,4	I 1,2,3,4	D1,2,3,4		I 1,2,3
39	Deal with individual and/or group conflict.		I 1,2,3				I		I 1,2,3,4	I1,2,3,4	I 1,2,3,4	D1,2,3,4		I 1,2,3
40	Independently research scientific and nonscientific information.	C 1,2,3	D1,2,3,4,5,6			D 1,2,3,4,5,6	D	D1,2,3,4,5,6	D 1,2,3,4	D1,2,3,4,5,6	D 1,2,3,4	D	D 1,2,3,4,5	D1,2,3,4,5,6
41	Competently use library resources.	C 1,2,3	D1,2,3,4,5,6	C		C 1,2,3,4,5,6	D	D1,2,3,4,5,6	D 1,2,3,4,5	I1,2,3,4	D 1,2,3,4,5	D	C 1,2,3,4,5	I 1,2,3
42	Manage time effectively.	I 1,2,3		I1		C 1,2,3,4,5,6	C 1,2,3,4,5,6		C 1,2,3,4,5		C 1,2,3,4,5			
43	Know how to facilitate group projects as well as be a good team member.	I 1,2,3		I1,2			C 1,2,3,4,5,6		C 1,2,3,4,5		C 1,2,3,4,5			
44	Handle multiple tasks and pressures.	I 1,2,3		I1,2		C 1,2,3,4,5,6	C 1,2,3,4,5,6		C 1,2,3,4,5		C 1,2,3,4,5			
	* Varies with type of project or internship													

FSC 430, SENSORY EVALUATION OF FOODS
University of Kentucky
Department of Animal and Food Sciences
Fall 2014

Meeting Time: Lecture: TR 1:00 PM – 1:50 PM, N320 Ag North
 Lab: R 11:00 AM – 12:50 PM, 104 GARR/216 GARR

Instructors:

Lecture Dr. Surendranath P. Suman, 405 W.P. Garrigus Building
 Phone: 859-257-3248; E-mail: spsuma2@uky.edu
 Cell: 859-229-3377; Alternate E-mail: spsuman@gmail.com

Lab Dr. Clair Hicks, 410 W.P. Garrigus Building
 Phone: 859-257-7538; E-mail: clhicks@uky.edu

Office Hours: Open or by appointment

“Food tastes best when you eat it with your own spoon”.

A Danish Proverb

COURSE DESCRIPTION:

FSC 430, Sensory Evaluation of Foods. 3 Credits (Lecture 2 hours; Lab 2 hours)

This course deals with the sensory evaluation methods used for food products based on flavor, odor, taste, color, and texture. This includes techniques for measuring sensory attributes, instrumental analyses of foods, statistical analyses of sensory data, and how sensory evaluation programs are utilized in the food industry.

Student Learning Outcomes:

Upon successful completion of the course, students will be able to:

- Design and execute sensory evaluation studies for food products.
- Statistically analyze sensory data, interpret results and make recommendations about product quality attributes.
- Apply the principles and techniques of sensory evaluation for developing novel food products.

Recommended Text (NOT required): *Sensory Evaluation Practices* (2004), 3rd Edition. Stone and Sidel, Elsevier Academic Press, New York. ISBN 978-0126726909.

In addition to this book, I have few books on sensory evaluation, which you may borrow for one 24-hour loan period.

Attendance: Students are expected to attend lectures and lab sessions. Policies for absence are those of the University of Kentucky, in Part II Sections 5.2.4.1 and 5.2.4.2 of Code of Student Conduct @ <http://www.uky.edu/StudentAffairs/Code/part2.html>. It is the student's responsibility to obtain handouts from lectures and labs that are missed.

Lab and Field Trip Reports: For all lab sessions and field trips, students are required to submit reports to Dr. Clair Hicks. Each report should summarize the work from the respective lab session or field trip. These reports must be typed and the hardcopy should be submitted to Dr. Hicks. All reports should contain title, objectives written in own words, brief description of materials and methods, results (data), interpretation of the observations, conclusion, and practical implications in food industry. All reports must be typed, double-spaced, 12-point font, and maximum 2 pages in length. Your English will be evaluated. Completed lab reports are due one week following the lab session or field trip. Late submission will result in loss of 10% points per day, of the maximum 10 points.

The reports will be evaluated for:

1. Overall organization, readability, and scientific expression
2. Clarity and accuracy of objective, methodology, and results
3. Description of observation and validity of the interpretation
4. Appropriateness of conclusion and implications

Exams: Exams will cover course materials discussed in the class, lab sessions, and handouts. Questions may consist of multiple choices, matching the appropriate, true or false, short answer, and essay. THE EXAMS WILL NOT BE CUMULATIVE. No make-up exams will be allowed unless there is a valid reason for missing an exam. Valid excuses for this will follow current regulations at University of Kentucky.

Exam # 1	Tuesday September 30, 2014
Exam # 2	Tuesday October 28, 2014
Exam # 3	Thursday December 4, 2014

Grading		Grade*	Percent
Exam # 1	100 Points	A	90-100
Exam # 2	100 Points	B	80-89
Exam # 3	100 Points	C	70-79
GCCR Writing Requirement	50 points	D	60-69
Lab Reports (15)	150 Points	E	≤ 59
<u>Total</u>	<u>500 Points</u>		

* The instructors reserve the right to lower the total point cutoff at which the grades are assigned depending on the overall class performance.

Cell phones and pagers: These devices MUST be silenced during the class.

Students with disabilities: If any student has a disability which may interfere with academic success, please bring it to the instructor's attention so that appropriate accommodations can be made.

Academic Integrity: University of Kentucky will not tolerate any form of cheating, plagiarism, or any other type of academic dishonesty. If a student is found in violation of academic honesty, the student will be subject to University Policy of Academic Integrity. For detailed information, please see Part II Sections 6.3 to 6.4.3 of University of Kentucky's Code of Student Conduct @ <http://www.uky.edu/StudentAffairs/Code/part2.html> .

University GCCR Writing Requirement

This writing requirement is mandatory to successfully complete the course. To partially fulfill the new University Graduation Composition and Communication Requirement (GCCR), a five page assignment should be submitted by each student taking the class. All submissions must be – typed in Microsoft Word; five double-spaced pages; 1 inch margin on all sides; font is Times New Roman; pages numbered. The assignment will be graded on correctness of English usage, sentence structure, and grammar. If you choose to use figures, the figures will be in addition to five page requirement. An average of “C” or better is required for the Food Science program GCCR assignments (conducted in FSC 430, FSC 530, and FSC 536) in order to meet the University of Kentucky’s GCCR requirement.

Topic for the Writing Requirement

In the mid-semester the students will receive opportunity to visit an industry location. This will be the first field trip. Two weeks after this field trip, students are required to submit a five page assignment covering the following aspects.

- (1) What are the major similarities and differences between the sensory facilities/program at the industry location and University of Kentucky?
- (2) Based on what you have learned so far in the course, is it necessary to have the differences you have observed? If so, why?
- (3) Did this field trip and the interactions with the industry leaders at the company you visited help you streamline your career objectives in sensory evaluation? How?

Draft: Should reach Dr. Suman via e-mail at spsuma2@uky.edu on or before 11:59 PM Eastern Time two weeks after the field trip. This will be returned, as hardcopy, with comments for improvement in a week during the lecture.

Final: Based on the comments, you will need to revise the assignment. The final revised version should reach Dr. Suman via e-mail at spsuma2@uky.edu on or before 11:59 PM Eastern Time two weeks after receiving the comments.

Evaluation criteria: 50 points (20 points for draft + 30 points for final)

- Organization: Is the text following an organized and logical sequence?
- Scientific facts: Are scientific facts expressed clearly, truthfully, and completely for public? Are they misinterpreted?
- Readability: Does the text flow smoothly? Are there mistakes in spelling or grammar? Any awkward sentences? Are the paragraphs logically constructed?

Writing center: I strongly encourage you to seek service of The Writing Center, University of Kentucky, located at Young Library, Thomas D. Clark Study, 5th Floor. This would definitely improve your technical writing skills and help you troubleshoot several things before the materials reach my desk.

Tentative Lecture and Lab Topics

Lecture:

- 1) Introduction to course
- 2) Organization of Sensory Programs
- 3) Measurements using descriptive and inferential statistics
- 4) Configuration of taste panel rooms and focus group rooms
- 5) Understanding various score cards
- 6) Human Senses; Anatomy and physiology of odor and taste
- 7) Odor terminology and perception; Cleaning up aftertastes and odors
- 8) Methods for determining taste thresholds; Taste modulators
- 9) Mouth feel and color
- 10) Selection and training of panel members
- 11) Effect of psychology on test results; Controlling psychological factors
- 12) SQS testing panels
- 13) Regional guidance testing
- 14) In-house testing against national brands
- 15) Consumer testing, Development of demographic information and scorecards
- 16) Development of scorecards for master graders; USDA Quality grading
- 17) Rapid screening of competitor products
- 18) Determining changes in national brands reverse engineering techniques
- 19) Instrumental measurements and correlation with sensory measurements
- 20) Using sensory evaluation to monitor consistency
- 21) Use of gold standards: pH, salt, Brookfield, spread test
- 22) Focus group moderation; Legal and informational focus groups
- 23) Use of master tasters/trained panels and training of master tasters
- 24) Defining the Target

Lab:

- 1) Statistical analysis of block designs – Problem set 1
- 2) Statistical analysis using statistical packages – Problem set 2
- 3) Use of various score cards for taste evaluations
- 4) Use of various score cards and techniques for odor evaluations
- 5) Determination of thresholds for acid, sweet, bitter, salty, umami
- 6) Determining fattiness, calcium metallicness, hotness, coolness, and oral temperature
- 7) Psychological factors that affect results; Masking color
- 8) In-house consumer tests with hedonic scorecards
- 9) Statistical analysis of consumer data
- 10) Use of a master grader score cards
- 11) Separating liquids and solids; Formulating
- 12) Instrumental evaluation of food texture
- 13) Instrumental evaluation of food color
- 14) Field trip to Brown Forman
- 15) Field trip to Givaudan

FSC 530 FOOD MICROBIOLOGY FALL SEMESTER 2014

GENERAL INFORMATION

COURSE DESCRIPTION

5 credit hours
3, 1 hour lectures - MWF 12:00 to 12:50
2, 2 hour labs - MW 1:00 to 2:50

INSTRUCTOR

Dr. Melissa Newman.
204 W.P. Garrigus Bldg
mnewman@uky.edu
Phone: 257-5881
Office Hours: MWF 8:00 to 11:00 am
TTH 8:00 to 11:00 am and 1:30 to 3:30 pm
Research Technician:
Kabby Akers
Teaching Assistants:
Hayriye Cetin Karaca

ACCESSING INFORMATION ON THE INTERNET

Blackboard at UK!

COURSE OBJECTIVES

By the end of this course, each student will be able to answer the following:

1. What factors influence microbial growth in foods?
2. What procedures and techniques can be used for the isolation and enumeration of microorganisms in foods?
3. What species, genera, and microbial groups are important to the food industry?
4. What procedures and techniques can be used for controlling microbial contamination of foods and food contact equipment?
5. What methods and principles can be used for controlling microbial contamination and for preventing subsequent growth of undesirable microorganisms in raw and processed foods?
6. What procedures can be used for reducing health hazards associated with foods and for extending the shelf life of foods?
7. What role does the food industry play in Agrosecurity?

LECTURE TOPICS!

Introduction
Growth of bacteria
Factors that affect microbial growth
 Intrinsic factors
 Extrinsic factors
 Barrier or hurdles
Microorganisms found in foods

Foodborne illness
-Bacteria
 Regular, non-spore forming gram positive cocci
 Endospore-forming gram positive rods and cocci
 Nonsporing gram positive rods
 Gram negative aerobic rods and cocci
 Gram negative facultatively anaerobic rods
 Aerobic/microaerophilic, motile, helical/vibrioid
-Fungi
 Molds
 Mycotoxins
 Yeasts
-Parasites causing foodborne illnesses
-Fish and seafood related illness
-Bacteriophage

Beneficial Organisms
 Starter cultures

 Fermentations in milk
 Fermented foods

Contamination of foods

ABSENTEEISM

UNEXCUSED ABSENCES

Assignments and examinations missed due to unexcused absences **cannot** be made up and a grade of zero (0) will be assigned to any student missing an examination due to an unexcused absence. Attendance is mandatory for this class, and for the second and each subsequent unexcused absence your final average will be lowered each time by **5 points**. To be counted as present, you must be present for the entire class session.

OTHER

"Policies related to excused absences, cheating/plagiarism, withdrawal, incompletes, final examinations and common exams can be found in your copy of *Student Rights and Responsibilities*. As students and faculty in the University of Kentucky, we are all responsible for adhering to these policies."

EXCUSED ABSENCE.

The following are defined as excused absences: (1) Illness of student or serious illness of a member of the student's immediately family. Appropriate verification may be requested by the instructor; (2) Death of a member of the student's immediately family. The instructor may request appropriate verification; (3) Trips for members of student organizations sponsored by an academic unit, trips for University classes, and trips for participation in intercollegiate athletic events. When feasible, the student must notify the instructor prior to the occurrence of such absences, but in no case shall such notification occur more than one week after the absence. The instructor may request formal notification from appropriate university personnel to document the student's participation in such trips; (4) Major Religious Holidays. Students are responsible for notifying the instructor **in writing** of their absences due to their observance of such holidays **no later than the last day for adding a class**. Students missing work due to an excused absence bear the responsibility of informing the instructor about their excused absence **within one week** following the period of the excused absence, except where prior notification is required, and of making up the missed work. If feasible, the student will be given the opportunity to make up the work during the semester in which the absence occurred. Students will be given the opportunity to make up exams missed due to an excused absence during the semester in which the absence occurred. In general, students will have **two (2) weeks** after their return to class to make up any work missed during an excused absence. **A grade of zero (0) will be given for any work not made up within two (2) weeks of your return to class.** Therefore, the burden is on you to make arrangements with the instructor to make up all work missed within two (2) weeks of your return to class.

GRADING

Written Examinations. Two (2) hour examinations (100 points per examination) and a final examination (200 points) focused on the material covered in lectures and assigned readings. Examinations may include any or all of the following types of questions: definitions, true-false, problems, multiple-choice, matching, short answer and essay.

Class Projects (100 points available). Small projects focused on current events that require students to do independent research and then participate in classroom discussion or a written report.

Weekly Quizzes (10 points per quiz). General questions relating to the current assignments in the laboratory or lecture may be included. Ten (10) quizzes will be given; however, your quiz grade will be based on nine (9) quizzes, since the lowest quiz grade or a quiz missed due to absenteeism will be dropped.

Laboratory Report (10 points per Laboratory Experiment). The Laboratory Report will consist of completing the Results and Observations Section (5 points) of each laboratory with the results and observations you obtained for each part of the Laboratory Experiment **as well as answering the questions listed under the Conclusion Section (5 points).** **The answers under the conclusions must be typed.** When your results differ from those expected, give an explanation for the difference and indicate what the correct results should have been. You will be graded on the basis of your techniques as observed during lab, the results obtained, and your conclusions. The Results and Observations Section must include drawings and written descriptions of all microscopic observations, counts and reactions obtained, and all calculations required for a given experiment.

Laboratory Questions (points per question indicated) or Review of a Research Article (25 Points). Most laboratory experiments will have questions, which are to be answered and turned in with the Laboratory Report. The references listed at the end of each experiment and the books and manuals on reserve in the library should be helpful in answering the questions. Some laboratory experiments will be accompanied by a short typed review of a current peer-reviewed article that pertains to the techniques or skills learned in the laboratory.

NOTE: Laboratory Reports Reviews and Questions are to be turned in to the instructor one (1) week after all data for a given experiment has been obtained (dates included on the laboratory schedule). If a report is submitted late, one (1) point will be subtracted for each day late. One (1) point will be subtracted per question for each day that a set of questions is late. **Any report or set of questions not turned in within one (1) week of the due date or by Friday of the last day of the semester will be given a grade of zero (0).**

Laboratory Unknown Project (200 points). Each student will receive a test tube containing three different microbial species. Using the skills and information obtained during the first half of the semester students will isolate and identify the three organisms. Students will be graded on correct identification, microbiological/analytical skills, prudent use of laboratory resources and scientific writing skills (including paragraph and sentence structure). Draft reports will be reviewed and feedback provided with the final project report turned in on or before noon **November 24, 2014.**

Laboratory Practical (50 points). The practical will focus on the bacterial enumeration techniques learned during the semester. Students will initiate enumerations on Monday December 1, 2014 and complete the practical on Wednesday December 3, 2014.

Laboratory Final (150 points). Students will be given a written examination encompassing the material covered in the laboratory experiments completed during the semester.

EXAMINATION SCHEDULE

Two one hour exams (100 points each) and a final examination (200 points) will be given according to the schedule below.

Examination 1	October 4, 2014
Examination 2	November 8, 2014
Final Examination	Wednesday December 18, 2012 @ 3:30pm

Points Possible

2 Hour Examinations (2 @ 100 points each)	200
Final Examination - comprehensive	200
Laboratory Experiments	120
Questions/Reviews	375
Class projects	100
Quizzes	90
Laboratory Unknown Project	200
Laboratory Test/Practical	200
TOTAL POINTS	1485*

*Extra credit projects may be offered to the class at the instructor’s discretion.

Final Grade

Final Grade =	$\frac{\text{total points accumulated}}{\text{total points possible}} \times 100 = \%$	
	Undergraduate Students	Graduate Students
A =	>90%	>93%
B =	89-80%	92-83%
C =	79-70%	82-73%
D =	69-60%	
E =	<59%	

Attention Food Science Majors!

The Laboratory Unknown Project Report will be used as partial fulfillment (1/3) for the University Graduation Composition and Communication Requirement (GCCR). An average of “C” or better is required for the Food Science program GCCR assignments (conducted in FSC 430, FSC 530, and FSC 536) in order to meet the University of Kentucky’s GCCR requirement.

LABORATORY EXPERIMENTS

Date	Lab #	Title	Lab. Pts	Questions /Journal Pts	Due Date
Sept 4	1	Intrinsic characteristics of foods	10	25	9/11
Sept 9&11	2	Methods For The Isolation Of Microorganisms	10	25	9/18
Sept 16&18	3	Gram-positive Bacteria	10	50	9/30
Sept 23&25	4	Spore-forming Bacteria	10	50	10/7
Sept 30& Oct 2	5	Gram-negative Bacteria	10	50	10/14
Oct 7&9	START Unknown Project!				
Oct 14&16	6	Fungi/Mold & Yeast	10	25	10/28
Oct 21&23	7	Preservatives	10	25	11/4
Oct 28&30	8	Spoilage	10	25	11/6
Nov 4&6	9	Principles of Quantitation/Plating Techniques	10	50	11/13
Nov 11&13	10	Sanitary Condition of food contact equipment	10	25	11/25
	11	<i>Escherichia coli</i> Testing For Process Control Verification in Cattle, Swine, And Poultry Slaughter Establishments	10		
Nov 18-22	Vitek analysis of unknown isolates. By appointment!				
Nov 25	Unknown Culture Identification Report Due (200 points)				
Dec 2&4	12	Methods and Procedures for The Enumeration of Selected Microbial Groups	10	25	12/11
Dec 6	Laboratory Test (150 points) – in class				
Dec 9&11	Plating Laboratory Practical (50 points)				

Course Outline

ADVANCED FOOD SCIENCE
Spring Semester 2014
FSC-536 Sec. 001

C. L. Hicks 257-7538
 410 W. P. Garrigus Bldg.
clhicks@uky.edu

Date	Lecture Material	Thursday Laboratory, 11:00 pm	
Jan	15	Introduction	Demographics, Rm 401
	17	Demographics	W.P. Garrigus 11:00-11:50
	20	Holiday - MLK	Thomas Penway Research
	21	NC*/Product Concept Development	Bart Borkorski, 11:00am, Rm 401
	22	Demographics	Concept research, Market research
	24	Why new product development	Focus Groups
	27	Concept due/suppliers order	Brown Forman, Leave: 11:00 Ar. 1:10 √confirmed
	28	NC/Prod. Dev. Time	Sheri Klose/Joe Zimlick
	29	Demographics	Concept development, Niche market analysis,
	31	Developing a great concept/testing	Super Groups, Monitoring world trends, Sensory
Feb	3	Shelf life Dev., Ordering	Dawn Foods, Laura Ekhardt Arrive 1:10 √Confirmed
	4	NC/Prod. Dev. Time	Project Proposals, Sign Offs, prioritizing. Dev
	5	R & D Trends	New products, Reformulation, Scale up
	7	Re-engineering competitors product	
	10	Std. of formula/Ordering	No Field Trip
	11	NC/Prod. Dev. Time	Hicks in Louisville
	12	Consumer conceptions	
	14	Dev. Sensory facility/cards/data	
	17	Food analysis, Sensory	Morgan Foods 1:35, Dama √ Confirmed
	18	NC/Prod. Dev. Time	Following National Trends
	19	Consumer conceptions	Cost formulation Sensory testing
	21	First Exam	labeling
	24	Sensory Card Dev.	Blaine Hicks, √ Confirmed 2-12
	25	NC/Prod. Dev. Time	Blue Grass Dairy and Foods; arrive 12:30
26	Antioxidants	Contract R & D, Niche marketing	
28	R&D Organization Formulating and testing	Ingredient Specifications, COA's Getting the product right	
Mar	3	Statistical data setup	The Kroger Co., 1:10-1:15
	4	NC/Prod. Dev. Time	Dr. Robert Bobo, Confirmed 2- 17
	5	Label Dev	Following Market Trends
	7	Building Shelf life	Developing competing products, Sensory testing
	10	Solving Specification Prob.	Wild Flavors Inc, 1:00 pm, Marlene Smothers
	11	NC/Prod. Dev. Time	Smothers, World Market Development ask 2-17
	12	Food Additives	Quality control across world markets
	14	Setting up QC tests SOP's, mapping, Specs, CO(A)	Food Additives-Fat Replacers Dev. of new markets

17-22 **Spring Break**

	24	Scorecards-Consumer testing	Kentucky Fried Chicken, YUM Lec
	25	NC/Prod. Dev. Time	Ms. Linda Munson,
	26	Food Additives-Fat Replacers	Concept Development Differential tests
	28	Second Exam	SQS, RGT tests
	31	Conducting Consumer tests	DD Williamson
Apr	1	NC/Prod. Dev. Time	Color Development
	2	Food Additives-sugars	
	4	Product Stabilization/Reformulation,	
	7	Data entry, Stat. Anal.	Papa Johns contacted
	8	NC/Prod. Dev. Time	Charlie Snyder
	9	Developing Standards	Marketing Concepts/New Products
	11	Establishing pkg. criteria Line extensions/ Market test	World markets. Web ordering
	14	HACCP procedures	Heinze Portion Control
	15	NC/Prod. Dev. Time	Ms. Jacque Pelfrey, QA
	16	Market Testing/market mixes	New Product launches, 2 hour recalls
	18	Archotyping	Advertisement, roll outs
	21	CEO recommendations	Proctor & Gamble, 1:20 pm Qingxin Lei
	22	NC/Prod. Dev. Time	Consumer Archotyping
	23	R & D ideation	
	25	Packaging development	
	28	no class meeting	
	29	NC/Prod. Dev. Time	
	30	The Corporate R&D process	Oral CEO Report
May	2	Printing Process	

Final Exam: Monday, May 5, 2014, 10:30 a.m., Room 109

*NC = No Class, This is laboratory time for individual teams to development new products.

☐ All Thursday trips leave from the lobby of Garrigus at 11:00 am unless scheduled otherwise.

Course Objective for FSC 536

To provide background of Research and Development of commercial food products. To become aware of R&D trends and consumers conceptions. To learn the concepts necessary to develop a new food products including: Consumer awareness, developing market concepts, testing product concepts, product formulation, developing ingredient specifications and check testing, product stabilization, consumer panels, packaging to meet shelf life goals, shelf life testing, challenge testing, dev. of HACCP programs, consumer testing, market testing, and introduction of products into the market.

FSC 536, Advanced Food Technology

4 credits: Lecture 2 hrs. on Wed. and Fri. (11:00 - 11:50 am, Meets in 109 Garrigus)
Product evaluation and Lab information, laboratory reports due, product ordering

(Monday 11:00 to 11:50 am, 109 W. P. Garrigus)
Time off for product research (Tue. TBA by students), Non instructional
laboratory work

Travel to various corporations, Thursday 11:00 am to 6:00 pm (meet in lobby of W. P. Garrigus)

Prerequisites: AEN 304 or FSC 306, FSC 530, FSC 535.

Dr. Hicks maintains an open door policy. Students are welcome to come and see Dr. Hicks at any time during the week.

Lecture Material

Two types of lecture material will be presented. On Wednesday lectures information on industrial trends, additives, standards, and marketing will be presented. Friday lectures will follow the R&D process and be tailored to enhance what was learned on the field trips. Students are encouraged to setup their note books so that each lecture series is combined together.

Grading for FSC 536

3 exams, non-comprehensive, each being 20% of total grade.....	50%
Progress Reports	30%
Final CEO oral report	3%
Concept Paper	5%
Tour participation	12%
Total	100%

Student with total point averages equal to or above 70, 80, and 90% will receive a C, B, or A, respectively. The instructor reserves the right to lower the total point average or cutoff at which an C, B, and A is given depending on class performance and participation. No points will be given or deducted for attendance or excused or un-excused absences, except for field trips. Progress reports are due on the completion date as determined by the GANTT chart. Late progress reports will be penalized 1 point (10%) per class period that they are late. Progress reports will be handed in using a standardized format including: objectives, procedures, results, discussion of results and conclusions. **All progress reports will be e-mailed to chicks@uky.edu or turned in on a CD using Word Perfect or Word as the word processor. All graphics, equations and tables will be cut into the text. File names should relate to the GANTT Chart.** One point (or 1 %) will be deducted for each tour missed, up to 12 points. One third of each exam will be from the lecture material obtained from the tour lectures. Students with excused absences may make up work or missed exams.

University GCCR Writing requirement

To partially fulfill the new University Graduation Composition and Communication Requirement (GCCR), a five page, double space, 12 pt. new times roman written report will be required of each student taking the class. The report will be graded on correctness of English usage, sentence structure, and grammar. If the report contains figures, the figures will be in addition to the written requirement. Each student will develop a 5 page report on a new product concept, justifying the concept using statistics or figures from recent trade articles or market data, suggest a target market, region where the product might be successful, provide a beginning receipt for the product, list any health attributes, nutritional or health labeling that might be included, and include any gimmicks that might enhance the sales of the new product. From the written concepts each R&D team will select the most appropriate concept for development.

An oral presentation of the executive R&D summary by the each R&D team will also be graded and be included as part of the GCCR writing requirement at the end of the semester. All

written and oral reports will be turned in as listed on the GNATT chart. An average of “C” or better is required for the Food Science program GCCR assignments (conducted in FSC 430, FSC 530, and FSC 536) in order to meet the University of Kentucky’s GCCR requirement.

Product Development Requirement

Students will be assigned to a development team. During the semester the student teams will develop a food product following the time line shown on the GNATT chart. The difficulty of the project is not nearly as important as learning the steps involved in the development process. Thus, students teams are encouraged to develop a product that is easy to prepare or one that they already know something about. Student teams may organize themselves in any fashion that suits the team members. However, when student teams turn in a project report all students on the team receive the same grade for the report. Thus, it is important that student teams agree upon the reports content before the report is turned in and graded. Students are responsible for ordering their supplies and samples from vendors. When supplies are purchased from local grocers the receipts can be turned into the department for reimbursement (Sheila Hollin, 910 Garrigus). Receipts must have the students name written on them, mailing address, the course number, the project, and be signed by Dr. Hicks. Student will receive a reimbursement check in the mail.

Graduate Students Requirement

The Graduate School requires that Graduate Students enrolled in a 500 level course be challenged in additional ways compared to the undergraduates taking the same course. Therefore, an additional requirement is required of all Graduate Students taking FSC536. All graduate students will be required to develop a 5 page (12 pt times new roman, 1½ spaced) written assessment comparing the R&D techniques used by the various companies that the class visits. The assessment will highlight the positive and negative aspects of these departments in the development of new products. The written assessment will be due the Monday of the last week of class (The Monday of dead week). The written assessment will be worth 8% of the Graduate Students grade.

Plagiarism and Cheating

Students are expected be academically honest. Plagiarism and other forms of cheating are absolutely unacceptable. Students are reminded that the minimum penalty for either of these academic offenses is an "E" in the course, with the possibilities suspension and/or dismissal. Students should never include web items in a report without referencing and should always put the information in their own words. Graphics are frequent sources of plagiarism that students should be careful to avoided.

Cell phone Policy: All cells phones should be turned off when coming into the class room. Cell phone should not be in vibrate mode.

Office Hours: Open door policy.

Texts for consultation:

Peters, T.J. and Waterman, Jr., R.H. 1982. In Search of Excellence: Lessons from America's Best-Run Companies. Warner Books Inc.

The Almanac. 2012. Edward E. Judge & Sons, Inc. P.O. Box 866. Westminster, MD 21157.
Tel: 301-876-2052.

FSC 536, Advanced Food Science
University of Kentucky

Course Setup:

Semester Credit Hours = 4

	Day of Week				
	Monday Thursday	Tuesday Friday		Wednesday	
Activity	Problem Solving . Reports Due. 11-11:50 a.m.	Lab Prep. of Food Product TBA by Students	Lecture 11-11:50 a.m.	Travel to Corp. R&D Center 11-6:00 p.m.	Lecture 11-11:50 a.m.

CEO Report

1. Written report with executive summary (may include slides from oral presentation)
2. Fifteen min oral presentation (PowerPoint) to class and other Food Science faculty
 - Power Point/Harvard Graphic slide showing
 - Target market
 - Market justification
 - Label development
 - Nutrition Facts
 - Health claim justification
 - Consumer panel data and demographics
 - Product package
 - Shelf life test
 - Test market recommendation

Types of Software used in FSC-536*

- Word processor
 - Microsoft Word
 - Word Perfect
- Presentation software
 - Power Point
 - Corel Presentations

University of Kentucky Food Science Program Anticipated 5-Year Assessment Plan (2014-2019)

Student Learning Outcome		Courses Typically Used for Primary Assessment	Primary IFT Core Competency used for Assessment*	2014-15	2015-16	2016-17	2017-18	2018-19
1	Apply a fundamental knowledge of food chemistry, microbiology, nutrition, processing, analyses and engineering toward food related research and product development.	FSC 304, FSC 434G, FSC 530, FSC 535, FSC 536	1, 2, 3, 12, 13, 32		X			
2	Apply quality assurance procedures in food processing such as Hazard Analysis and Critical Control Points (HACCP) toward the production of safe and nutritious foods.	FSC 107, FSC 306, FSC 530, FSC 536, FSC 538	16, 22, 24, 27, 30	X			X	
3	Be able to effectively use federal laws and regulations toward the development, manufacture and sale of foods and food products.	FSC 107, FSC 306, FSC 538	23, 28, 29	X				
4	Evaluate and recommend appropriate laboratory techniques relevant to a particular application or problem.	FSC 434G, FSC 530, FSC 535	4, 5, 6, 7, 10, 32		X		X	
5	Efficiently organize and manage assignments in an ethical and professional manner in order to meet deadline challenges.	CLD 230, FSC 304, FSC 536	34, 38, 39, 43,44			X		
6	Be able to select, evaluate, and convey scientific information using communication and information technology skills to individuals or groups at various educational levels.	FSC 304, WRD 203, FSC 535, FSC 536	31, 33, 40, 41			X		X
7	Apply a thorough academic background in food science and related disciplines toward successful entry-level employment within the food industry, or for transition to a food science graduate program.	FSC 107, (FSC 395 or FSC 399), FSC 536,	24, 35, 36					X

*See IFT Core Competency Chart for Corresponding Number

Appendix 7: Course Change Form for FSC 304 "Animal Food Products"

e

Courses	Request Tracking
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Course Change Form

<https://myuk.uky.edu/sap/bc/soap/rfc?services=>
[Open in full window to print or save](#)

Generate R

Attachments:

Browse...		Upload File
	ID	Attachment
Delete	1396	FSC 304-Course Change.pdf
First 1 Last		

Select saved project to retrieve...

Get New

NOTE: Start form entry by choosing the Current Prefix and Number
(*denotes required fields)

	Current Prefix and Number:	FSC - Food Science FSC 304 - ANIMAL DERIVED FOODS	Proposed Prefix & Number:	FSC 304
*	What type of change is being proposed?	<input checked="" type="checkbox"/> Major Change <input type="checkbox"/> Major - Add Distance Learning <input type="checkbox"/> Minor - change in number within the same hundred series, exceptior -799 is the same "hundred series" <input type="checkbox"/> Minor - editorial change in course title or description which does not change in content or emphasis <input type="checkbox"/> Minor - a change in prerequisite(s) which does not imply a change in course content or emphasis, or which is made necessary by the elimina or significant alteration of the prerequisite(s) <input type="checkbox"/> Minor - a cross listing of a course as described above		
	Should this course be a UK Core Course?	<input type="radio"/> Yes <input checked="" type="radio"/> No If YES, check the areas that apply: <input type="checkbox"/> Inquiry - Arts & Creativity <input type="checkbox"/> Composition & Communications - II <input type="checkbox"/> Inquiry - Humanities <input type="checkbox"/> Quantitative Foundations <input type="checkbox"/> Inquiry - Nat/Math/Phys Sci <input type="checkbox"/> Statistical Inferential Reasoning <input type="checkbox"/> Inquiry - Social Sciences <input type="checkbox"/> U.S. Citizenship, Community, Diversity <input type="checkbox"/> Composition & Communications - I <input type="checkbox"/> Global Dynamics		
1.	General Information			
a.	Submitted by the College of:	College of Agriculture	Today's Date:	2/14/2013
b.	Department/Division:	Animal and Food Sciences		
c.*	Is there a change in "ownership" of the course?	<input type="radio"/> Yes <input checked="" type="radio"/> No If YES, what college/department will offer the course instead? <input type="text" value="Select..."/>		
e.*	* Contact Person Name:	Surendranath P. Suman	Email:	spsuma2@uky.edu
	* Responsible Faculty ID (if different from Contact)		Email:	
			Phone:	859-257-3248
f.*	Requested Effective Date:	<input type="checkbox"/> Semester Following Approval	OR	Specific Term: <input type="text" value="2 Spring 2014"/>
2.	Designation and Description of Proposed Course.			
a.	Current Distance Learning(DL) Status:	<input checked="" type="radio"/> N/A <input type="radio"/> Already approved for DL* <input type="radio"/> Please Add <input type="radio"/> Please Drop		
	*If already approved for DL, the Distance Learning Form must also be submitted <u>unless</u> the department affirms (by checking this box) that the proposed change not affect DL delivery.			
b.	Full Title:	ANIMAL DERIVED FOODS	Proposed Title: *	ANIMAL FOOD PRODUCTS
c.	Current Transcript Title (if full title is more than 40 characters):	ANIMAL DERIVED FOODS		

c.	Proposed Transcript Title (if full title is more than 40 characters):		ANIMAL FOOD PRODUCTS		
d.	Current Cross-listing:	<input checked="" type="checkbox"/> N/A	OR	Currently ³ Cross-listed with (Prefix & Number):	none
	Proposed – ADD ³ Cross-listing (Prefix & Number):				
	Proposed – REMOVE ^{3,4} Cross-listing (Prefix & Number):				
e.	Courses must be described by <u>at least one</u> of the meeting patterns below. Include number of actual contact hours ⁵ for each meeting pattern				
Current:	Lecture 3	Laboratory ⁵ 4	Recitation	Discussion	Indep. Study
	Clinical	Colloquium	Practicum	Research	Residency
	Seminar	Studio	Other	Please explain:	
Proposed: *	Lecture 3	Laboratory ⁵ 2	Recitation	Discussion	Indep. Study
	Clinical	Colloquium	Practicum	Research	Residency
	Seminar	Studio	Other	Please explain:	
f.	Current Grading System:	ABC Letter Grade Scale			
	Proposed Grading System:*	<input checked="" type="radio"/> Letter (A, B, C, etc.) <input type="radio"/> Pass/Fail			
g.	Current number of credit hours:	5	Proposed number of credit hours:*	4	
h.*	Currently, is this course repeatable for additional credit?				<input type="radio"/> Yes <input checked="" type="radio"/> No
*	Proposed to be repeatable for additional credit?				<input type="radio"/> Yes <input checked="" type="radio"/> No
	If YES:	Maximum number of credit hours:			
	If YES:	Will this course allow multiple registrations during the same semester?			<input type="radio"/> Yes <input checked="" type="radio"/> No
i.	Current Course Description for Bulletin:				
	Principles of red meat, poultry, fish and dairy processing; physical and chemical composition and nutritive value of meat, dairy and egg products; structure and identification of muscle; inspection, grading, formulation, processing and preservation methods; organoleptic properties and consumer acceptance of processed meat, dairy, and egg products. Lecture, three hours; laboratory, four hours per week.				
*	Proposed Course Description for Bulletin:				
	Principles of red meat, poultry, fish and dairy processing; physical and chemical composition and nutritive value of meat, dairy and egg products; structure and identification of muscle; inspection, grading, formulation, processing and preservation methods; organoleptic properties and consumer acceptance of processed meat, dairy, and egg products. Lecture, three hours; laboratory, two hours per week.				
j.	Current Prerequisites, if any:				
	Prereq: GEN 106 or GEN 107.				
*	Proposed Prerequisites, if any:				
	Prereq: FSC 107.				
*					
k.	Current Supplementary Teaching Component, if any:			<input type="radio"/> Community-Based Experience	

		<input type="radio"/> Service Learning <input type="radio"/> Both
	<i>Proposed Supplementary Teaching Component:</i>	<input type="radio"/> Community-Based Experience <input type="radio"/> Service Learning <input type="radio"/> Both <input type="radio"/> No Change
3.	Currently, is this course taught off campus?	<input type="radio"/> Yes <input checked="" type="radio"/> No
*	<i>Proposed to be taught off campus?</i>	<input type="radio"/> Yes <input checked="" type="radio"/> No
	If YES, enter the off campus address: <input type="text"/>	
4.*	Are significant changes in content/student learning outcomes of the course being proposed?	<input type="radio"/> Yes <input checked="" type="radio"/> No
	If YES, explain and offer brief rationale:	
	<div style="border: 1px solid black; height: 80px;"></div>	
5.	Course Relationship to Program(s).	
a.*	Are there other depts and/or pgms that could be affected by the proposed change?	<input type="radio"/> Yes <input checked="" type="radio"/> No
	If YES, identify the depts. and/or pgms:	
	<div style="border: 1px solid black; height: 80px;"></div>	
b.*	Will modifying this course result in a new requirement^z for ANY program?	<input type="radio"/> Yes <input checked="" type="radio"/> No
	If YES ^z , list the program(s) here:	
	<div style="border: 1px solid black; height: 80px;"></div>	
6.	Information to be Placed on Syllabus.	
a.	<input type="checkbox"/> Check box if changed to 400G or 500.	If changed to 400G- or 500-level course you must send in a syllabus and <i>you must include the differentiation</i> between undergraduate and graduate students by: (i) requiring additional assignments by the graduate students; and/or (ii) establishir different grading criteria in the course for graduate students. (See SR 3.1.4.)

^zSee comment description regarding minor course change. *Minor changes are sent directly from dean's office to Senate Council Chair.* If Chair deems the change as "not minor," the form will t appropriate academic Council for normal processing and contact person is informed.

^zCourses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.

^zSignature of the chair of the cross-listing department is required on the Signature Routing Log.

^zRemoving a cross-listing does not drop the other course – it merely unlinks the two courses.

^zGenerally, undergrad courses are developed such that one semester hr of credit represents 1 hr of classroom meeting per wk for a semester, exclusive of any lab meeting. Lab meeting gene least two hrs per wk for a semester for 1 credit hour. (See SR 5.2.1.)

^zYou must also submit the Distance Learning Form in order for the course to be considered for DL delivery.

^zIn order to change a program, a program change form must also be submitted.

[Submit as New Proposal](#)
 [Save Current Changes](#)
 [Delete Form Data and Attachments](#)

Appendix O

Food Science Major and
Minor Curriculum
Changes (2014-15)

Appendix O - Food Science Major and Minor Curriculum Changes (2014-15)

1. General Information

College: <u>Agriculture, Food and Environment</u>		Department: <u>Animal and Food Sciences</u>	
Current Major Name: <u>Food Science</u>		Proposed Major Name: <u>Food Science</u>	
Current Degree Title: <u>Bachelor of Science in Food Science</u>		Proposed Degree Title: <u>Bachelor of Science in Food Science</u>	
Formal Option(s): <u>NA</u>		Proposed Formal Option(s): <u>NA</u>	
Specialty Field w/in Formal Option: <u>NA</u>		Proposed Specialty Field w/in Formal Options: <u>NA</u>	
Date of Contact with Associate Provost for Academic Administration ¹ : <u>2-3-2014</u>			
Bulletin (yr & pgs):	<u>2014-15, p. 108-109.</u>	CIP Code ¹ :	<u>01.1001</u>
		Today's Date:	<u>8-7-2014</u>
Accrediting Agency (if applicable): <u>Institute of Food Technologists</u>			
Requested Effective Date: <input checked="" type="checkbox"/> Semester following approval. OR <input type="checkbox"/> Specific Date ² : _____			
Dept. Contact Person: <u>Melissa Newman</u>		Phone: <u>7-5881</u>	Email: <u>mnewman@uky.edu</u>

2. General Education Curriculum for this Program:

The new General Education curriculum is comprised of the equivalent of 30 credit hours of course work. There are, however, some courses that exceed 3 credits & this would result in more than 30 credits in some majors.

- There is no foreign language requirement for the new Gen Ed curriculum.
- There is no General Education Electives requirement.

Please list the courses/credit hours currently used to fulfill the University Studies/General Education curriculum:

Intellectual Inquiry in Arts and Creativity--choose from approved list: 3 credits
Intellectual Inquiry in the Humanities--choose from approved list: 3 credits
Intellectual Inquiry in the Social Sciences--choose from approved list: 3 credits
Intellectual Inquiry in the Natural, Physical and Mathematical Sciences--
CHE 105, General College Chemistry I, 4 credits and
CHE 111, Laboratory to Accompany General Chemistry I, 1 credit
Composition and Communication I, CIS/WRD 110, Composition and Communication I, 3 credits
Composition and Communication II, CIS/WRD 111, Composition and Communication II, 3 credits
Quantitative Foundations--
MA 123, Elementary Calculus and Its Applications OR
MA 113, Calculus I OR
MA 137, Calculus I With Life Science Applications, 4 credits
Statistical Inferential Reasoning--
STA 210, Making Sense of Uncertainty: An Introduction to Statistical Reasoning, 3 credits
Community, Culture and Citizenship in the USA--GEN 100, Issues in Agriculture, Food and Environment, 3 credits
Global Dynamics--choose from approved list: 3 credits
Total UK Core, current--33 credits.

¹ Prior to filling out this form, you MUST contact the Associate Provost for Academic Administration (APAA). If you do not know the CIP code, the (APAA) can provide you with that during the contact.

² Program changes are typically made effective for the semester following approval. No program will be made effective until all approvals are received.

Please identify below the suggested courses/credit hours to fulfill the General Education curriculum.

General Education Area	Course	Credit Hrs
I. Intellectual Inquiry (one course in each area)		
Arts and Creativity	<i>choose from list</i>	<u>3</u>
Humanities	<i>choose from list</i>	<u>3</u>
Social Sciences	<i>choose from list</i>	<u>3</u>
Natural/Physical/Mathematical	<u>CHE 105 & 111</u>	<u>5</u>
II. Composition and Communication		
Composition and Communication I	CIS or WRD 110	3
Composition and Communication II	CIS or WRD 111	3
III. Quantitative Reasoning (one course in each area)		
Quantitative Foundations ³	<u>MA 123 OR MA 137</u>	<u>4</u>
Statistical Inferential Reasoning	<u>STA 296</u>	<u>3</u>
IV. Citizenship (one course in each area)		
Community, Culture and Citizenship in the USA	<u>GEN 100</u>	<u>3</u>
Global Dynamics	<i>choose from list</i>	<u>3</u>
Total General Education Hours		<u>33</u>

3. Explain whether the proposed changes to the program (as described in sections 4 to 12) involve courses offered by another department/program. Routing Signature Log must include approval by faculty of additional department(s).

GCCR requirement will be fulfilled by WRD 203 Business Writing. Documents for submission will be submitted to the WRD department in Fall 2014 for final revisions. Formal submission is pending early Fall 2014.

4. Explain how satisfaction of the University Graduation Writing Requirement will be changed.

Current	Proposed
<input type="checkbox"/> Standard University course offering. List: _____	<input type="checkbox"/> <i>Standard University course offering.</i> <i>List: _____</i>
<input type="checkbox"/> Specific course – list: _____	<input checked="" type="checkbox"/> <i>Specific course) – list: <u>WRD-203, Business Writing</u></i>

5. List any changes to college-level requirements that must be satisfied.

Current	Proposed
<input checked="" type="checkbox"/> Standard college requirement. List: <u>GEN 100, Issues in Agriculture, Food and Environment, 3 credits</u>	<input checked="" type="checkbox"/> <i>Standard college requirement.</i> <i>List: <u>GEN 100, Issues in Agriculture, Food and Environment, 3 credits.</u></i>
<input type="checkbox"/> Specific required course – list: _____	<input type="checkbox"/> <i>Specific course – list: _____</i>

³ Note that MA 109 is NOT approved as a Quantitative Foundations course. Students in a major requiring calculus will use a calculus course (MA 113, 123, 137 or 138) while students not requiring calculus should take MA 111, PHI 120 or another approved course.

6. List pre-major or pre-professional course requirements that will change, including credit hours.

Current	Proposed
<p><u>*Note that the current bulletin splits these into two categories, as follows:</u></p> <p><u>Prerequisites for upper-division courses:</u> <u>BIO 150, Principles of Biology I, 3 credits</u> <u>BIO 152, Principles of Biology II, 3 credits</u> <u>CHE 105, General College Chemistry I, 4 credits</u> <u>CHE 107, General College Chemistry II, 3 credits</u> <u>CHE 111, Laboratory to Accompany General Chemistry I, 1 credit</u> <u>CHE 113, Laboratory to Accompany General Chemistry II, 2 credits</u> <u>MA 123, Elementary Calculus and Its Applications OR</u> <u>MA 113, Calculus I OR</u> <u>MA 137, Calculus I With Life Science Applications, 4 credits</u> <u>Total prerequisite hours--20 credits</u></p> <p><u>Premajor Requirements:</u> <u>*MA 132, Calculus for the Life Sciences, 3 credits</u> <u>BIO 208, Principles of Microbiology, 3 credits</u> <u>BIO 209, Introductory Microbiology Laboratory, 2 credits</u> <u>CHE 236, Survey of Organic Chemistry, 3 credits</u> <u>DHN 212, Introductory Nutrition, 3 credits</u> <u>PHY 211, General Physics, 5 credits</u> <u>STA 291, Statistical Methods, 3 credits</u> <u>Total premajor hours--22 credits</u></p> <p><u>*Students who take MA 113 or MA 137 do not need to take MA 132</u></p>	<p><u>Note that we would prefer to simply list one category--premajor requirements, in the new version of the Bulletin.</u></p> <p><u>BIO 148, Principles of Biology I, 3 credits</u> <u>BIO 152, Principles of Biology II, 3 credits</u></p> <p><u>ECO 201, Principles of Economics I, 3 credits</u></p> <p><u>BIO 208, Principles of Microbiology, 3 credits</u></p> <p><u>BIO 209, Introductory Microbiology Laboratory, 2 credits</u> <u>CHE 105, General College Chemistry I, 4 credits</u> <u>CHE 107, General College Chemistry II, 3 credits</u> <u>CHE 111, Laboratory to Accompany General Chemistry I, 1 credit</u> <u>CHE 113, Laboratory to Accompany General Chemistry II, 2 credits</u> <u>CHE 236, Survey of Organic Chemistry, 3 credits OR</u> <u>CHE 230, Organic Chemistry I, 3 credits</u></p> <p><u>DHN 212, Introductory Nutrition, 3 credits</u></p> <p><u>MA 123, Elementary Calculus and Its Applications, 4 credits AND</u> <u>MA 162, Finite Mathematics and Its Applications, 3 credits, (total of 7 credits) OR</u></p> <p><u>MA 110, Algebra and Trigonometry for Calculus, 4 credits AND</u> <u>MA 137, Calculus I With Life Science Applications, 4 credits (total of 8 credits).</u> <u>STA 296, Statistical Methods and Motivations, 3 credits</u></p> <p><u>Total premajor hours--40-41 credits</u></p>

7. List the major's course requirements that will change, including credit hours.

Current	Proposed
<p><u>FSC 107, Introduction to Food Science, 3 credits</u> <u>AEN 340, Principles of Food Engineering, 4 credits</u></p> <p><u>DHN 311 Nutritional Biochemistry, 3 credits OR</u> <u>BCH 401G, Fundamentals of Biochemistry, 3 credits</u></p> <p><u>FSC 306, Introduction to Food Processing, 4 credits</u> <u>FSC 434G, Food Chemistry, 4 credits</u> <u>FSC 530, Food Microbiology, 5 credits</u></p>	<p><u>FSC 107, Introduction to Food Science, 3 credits</u> <u>FSC 306, Introduction to Food Processing, 4 credits</u></p> <p><u>FSC 395 Special Problem in Food Science, 3 credits</u> <u>OR FSC 399 Experiential Learning in Animal Sciences/Food Science, 3 credits</u> <u>OR EXP 396 Experiential Education, 3-6 credits</u></p> <p><u>FSC 434G, Food Chemistry, 4 credits</u></p>

<u>FSC 535, Food Analysis, 4 credits</u> <u>FSC 536, Advanced Food Technology, 4 credits</u> <u>Total major hours, 31 credits</u>	<u>FSC 530, Food Microbiology, 5 credits</u> <u>FSC 535, Food Analysis, 4 credits</u> <u>FSC 536, Advanced Food Technology, 4 credits</u> <u>Students must select at least 3 of the following 4 courses:</u> <u>FSC 304, Animal Food Products, 4 credits</u> <u>FSC 430, Sensory Evaluation, 3 credits</u> <u>FSC 538, Food Fermentation and Thermal Processing, 4 credits</u> <u>FSC 540, Food Sanitation, 4 credits</u> <u>Total major hours, 38-42 credits</u>
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8. Does the pgm require a minor AND does the proposed change affect the required minor? N/A Yes No
 If "Yes," indicate current courses and proposed changes below.

Current	Proposed
<u>no minor is currently required</u>	<u>no minor is proposed to be required</u>

9. Does the proposed change affect any option(s)? N/A Yes No
 If "Yes," indicate current courses and proposed changes below, including credit hours, and also specialties and subspecialties, if any.

Current	Proposed
<u>no options exist currently</u>	<u>no options are proposed</u>

10. Does the change affect pgm requirements for number of credit hrs outside the major subject in a related field? Yes No
 If so, indicate current courses and proposed changes below.

Current	Proposed
_____	_____

11. Does the change affect pgm requirements for technical or professional support electives? Yes No
 If so, indicate current courses and proposed changes below.

Current	Proposed
<u>On the current descriptions of this program, these courses are described as "Specialty Support."</u> <u>Students must select 22 credits from the following suggested list of support courses:</u> <u>AEC 305, Food and Agricultural Marketing Principles, 3 credits</u> <u>ABT/ENT 360, Genetics, 3 credits</u> <u>CS 101, Introduction to Computing I, 3 credits</u> <u>ECO 201, Principles of Economics I, 3 credits</u> <u>FSC 304, Animal Food Products, 4 credits</u> <u>FSC 395, Special Problem in Food Science, 1-4 credits</u> <u>FSC 399, Experiential Learning in Animal Sciences/Food Science, 1-6 credits</u> <u>FSC 430, Sensory Evaluation of Foods, 3 credits</u> <u>FSC 538, Food Fermentation and Thermal</u>	<u>In the new version of this program, we would like to describe the courses below as "Specialty Support."</u> <u>AEN 340, Principles of Food Engineering, 4 credits</u> <u>DHN 311 Nutritional Biochemistry, 3 credits OR</u> <u>BCH 401G, Fundamentals of Biochemistry, 3 credits</u> <u>PHY 211, General Physics, 5 credits</u> <u>Students must select 2 of the following 3 courses:</u> <u>AEC 305, Food and Agricultural Marketing Principles, 3 credits</u> <u>ASC 300, Meat Science, 4 credits</u> <u>CLD 230, Intrapersonal Leadership, 3 credits OR</u> <u>CLD 340, Community Interaction, 3 credits</u>

<u>Processing, 4 credits</u> <u>FSC 540, Food Sanitation, 3 credits</u> <u>DHN 340, Experimental Foods, 3 credits.</u> <u>Total, special support hours--22 credits.</u>	<u>Total Specialty Support hours--18-19 credits.</u>
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12. Does the change affect a minimum number of free credit hours or support electives?

Yes No

If "Yes," indicate current courses and proposed changes below.

Current	<i>Proposed</i>
<u>minimum of 15 free elective credits</u>	<u>3 free elective credits</u>

13. Summary of changes in required credit hours:

	Current	<i>Proposed</i>
a. Credit Hours of Premajor or Preprofessional Courses:	<u>39-42</u>	<u>40-41</u>
b. Credit Hours of Major's Requirements:	<u>31</u>	<u>38-42</u>
c. Credit Hours for Required Minor:	<u>NA</u>	<u>NA</u>
d. Credit Hours Needed for a Specific Option:	<u>NA</u>	<u>NA</u>
e. Credit Hours Outside of Major Subject in Related Field:	<u>NA</u>	<u>NA</u>
f. Credit Hours in Technical or Professional Support Electives:	<u>22</u>	<u>18-19</u>
g. Minimum Credit Hours of Free/Supportive Electives:	<u>15</u>	<u>3</u>
h. Total Credit Hours Required by Level:		
	100: <u>47</u>	<u>32</u>
	200: <u>28</u>	<u>19</u>
	300: <u>20</u>	<u>14</u>
	400-500: <u>25</u>	<u>21</u>
i. Total Credit Hours Required for Graduation:	<u>128</u>	<u>120</u>

14. Rationale for Change(s) – if rationale involves accreditation requirements, please include specific references to that.

The Food Science BS program is accredited by the Institute of Food Technologists (IFT). Therefore, any curricular changes must maintain the integrity of the program with respect to requirements of the accreditor; the modifications listed herein accomplish that primary objective. Other program updates include modifications in the both areas of the quantitative reasoning category of UK Core: MA 113 is dropped as an option for quantitative foundations and STA 296 replaces STA 210 for statistical inferential reasoning (SIR). In the past, Food Science students had to take both STA 210 and STA 291; now, since STA 296 can satisfy SIR and provide training in statistical methods, the faculty have decided to switch to that single course. With the advent of the Graduation Composition and Communications Requirement (GCCR), the Food Science faculty have chosen to meet that requirement using WRD 203 Business Writing, documentation pending. The presentation of pre-major courses has been clarified as a single grouping of courses, with updates in ECO, BIO, CHE, MA, and STA requirements. Note that PHY 211 has been moved to the Specialty Support category, and ECO 201 has moved to the pre-major category. Significant changes have been implemented in the major course listing; the proposed listing will be exclusively FSC courses. Seven credits from the major (AEN 340, 4 credits; and either DHN 311 or BCH 401G, 3 credits) are to be moved to Specialty Support, which are understood to be required courses per FSC faculty. Under the previous program, the Specialty Support category included numerous FSC courses. In the College of Agriculture, Food and Environment, specialty support courses are not allowed to include major courses. The new Specialty Support category no longer includes any FSC courses. Our Total Credit Hours Required to Graduate has changed from 128 to 120

due to the numerous changes in courses. CHE 105/111, MA 123 or 137 and STA 296 in our premajor course section also satisfies various UK Core requirements. While the courses are repeated in the section listings and their hours are reflected in the section totals, they have only been counted once in the Total Credit Hours to Graduate section.

15. List below the typical semester by semester program for the major. If multiple options are available, attach a separate sheet for each option.

YEAR 1 – FALL: (e.g. “BIO 103; 3 credits”)	<u>UK CORE, A&C; 3 credits</u> <u>CHE 105; 4 credits</u> <u>CHE 111; 1 credit</u> <u>WRD 110; 3 credits</u> <u>GEN 100; 3 credits</u> <u>Semester total; 14 credits.</u>	YEAR 1 – SPRING:	<u>CHE 107; 3 credits</u> <u>CHE 113; 2 credits</u> <u>WRD 111; 3 credits</u> <u>MA 110 or 123; 4 credits</u> <u>FSC 107; 3 credits</u> <u>DHN 212; 3 credits</u> <u>Semester total; 18 credits</u>
YEAR 2 - FALL :	<u>CHE 236; 3 credits</u> <u>BIO 148; 3 credits</u> <u>ECO 201; 3 credits</u> <u>WRD 203; 3 credits</u> <u>MA 137 or 162; 3-4 credits</u> <u>Semster total; 15-16 credits</u>	YEAR 2 – SPRING:	<u>BIO 152; 3 credits</u> <u>PHY 211; 5 credits</u> <u>STA 296; 3 credits</u> <u>FSC 304; 4 credits</u> <u>BCH 401G; 3 credits</u> <u>Semester total; 18 credits</u>
YEAR 3 - FALL:	<u>AEN 340; 4 credits</u> <u>FSC 306; 4 credits</u> <u>FSC 430; 3 credits</u> <u>ASC 300; 4 credits</u> <u>Semester total; 15 credits</u>	YEAR 3 - SPRING:	<u>UK CORE, Soc Sci; 3 credits</u> <u>FSC 434G; 4 credits</u> <u>BIO 208; 3 credits</u> <u>BIO 209; 2 credits</u> <u>Free elective; 3 hours</u> <u>Semester total; 15 credits</u>
YEAR 4 - FALL:	<u>FSC 399; 3 credits</u> <u>FSC 530; 5 credits</u> <u>FSC 535; 4 credits</u> <u>AEC 305; 3 credits</u> <u>Semester total; 15 credits</u>	YEAR 4 - SPRING:	<u>UK CORE, Hum.; 3 credit</u> <u>UK CORE, Glo Dyn; 3 credits</u> <u>FSC 536; 4 credits</u> <u>FSC 538; 4 credits</u> <u>Semester total; 14 credits</u>

Signature Routing Log

General Information:

Current Degree Title and Major Name: Bachelor of Science in Food Science; Major--Food Science

Proposal Contact Person Name: Melissa Newman

Phone: 7-5881

Email:
mnewman@uky.edu

INSTRUCTIONS:

Identify the groups or individuals reviewing the proposal; note the date of approval; offer a contact person for each entry; and obtain signature of person authorized to report approval.

Internal College Approvals and Course Cross-listing Approvals:

Reviewing Group	Date Approved	Contact Person (name/phone/email)	Signature
Food Science Faculty		Melissa Newman / 7-5881 / mnewman@uky.edu	
Animal and Food Sciences Department		Bob Harmon / 7-2686 / rharmon@uky.edu	
Undergraduate Curriculum Committee, College of Agriculture, Food and Environment		Larry J. Grabau / 7-3469 / Larry.Grabau@uky.edu	
		/ /	
		/ /	

External-to-College Approvals:

Council	Date Approved	Signature	Approval of Revision ⁴
Undergraduate Council			
Graduate Council			
Health Care Colleges Council			
Senate Council Approval		University Senate Approval	

Comments:

⁴ Councils use this space to indicate approval of revisions made subsequent to that council's approval, if deemed necessary by the revising council.

1. General Information

College:	<u>Agriculture, Food and Environment</u>	Department:	<u>Animal and Food Sciences</u>
Current Major Name:	<u>Food Science</u>	Proposed Major Name:	<u>Food Science</u>
Current Degree Title:	<u>Bachelor of Science in Food Science</u>	Proposed Degree Title:	<u>Bachelor of Science in Food Science</u>
Formal Option(s):	<u>N/A</u>	Proposed Formal Option(s):	<u>N/A</u>
Specialty Field w/in Formal Option:	<u>N/A</u>	Proposed Specialty Field w/in Formal Options:	<u>N/A</u>
Date of Contact with Associate Provost for Academic Administration ¹ :	<u>3-4-2015</u>		
Bulletin (yr & pgs):	<u>2015-16, p. 108-109.</u>	CIP Code ¹ :	<u>01.1001</u>
		Today's Date:	<u>3-9-2015</u>
Accrediting Agency (if applicable):	<u>Institute of Food Technologists</u>		
Requested Effective Date:	<input checked="" type="checkbox"/> Semester following approval.	OR	<input type="checkbox"/> Specific Date ² : _____
Dept. Contact Person:	<u>Melissa Newman</u>	Phone:	<u>7-5881</u>
		Email:	<u>mnewman@uky.edu</u>

2. General Education Curriculum for this Program:

The new General Education curriculum is comprised of the equivalent of 30 credit hours of course work. There are, however, some courses that exceed 3 credits & this would result in more than 30 credits in some majors.

- There is no foreign language requirement for the new Gen Ed curriculum.
- There is no General Education Electives requirement.

Please list the courses/credit hours currently used to fulfill the University Studies/General Education curriculum:

Intellectual Inquiry in Arts and Creativity--choose from approved list: 3 credits
Intellectual Inquiry in the Humanities--choose from approved list: 3 credits
Intellectual Inquiry in the Social Sciences--choose from approved list: 3 credits
Intellectual Inquiry in the Natural, Physical and Mathematical Sciences--
CHE 105, General College Chemistry I, 4 credits and
CHE 111, Laboratory to Accompany General Chemistry I, 1 credit
Composition and Communication I, CIS/WRD 110, Composition and Communication I, 3 credits
Composition and Communication II, CIS/WRD 111, Composition and Communication II, 3 credits
Quantitative Foundations--
MA 123, Elementary Calculus and Its Applications OR
MA 137, Calculus I With Life Science Applications, 4 credits
Statistical Inferential Reasoning--
STA 296, Statistical Methods and Motivations, 3 credits
Community, Culture and Citizenship in the USA--GEN 100, Issues in Agriculture, Food and Environment, 3 credits
Global Dynamics--choose from approved list: 3 credits
Total UK Core, current--33 credits.

¹ Prior to filling out this form, you MUST contact the Associate Provost for Academic Administration (APAA). If you do not know the CIP code, the (APAA) can provide you with that during the contact.

² Program changes are typically made effective for the semester following approval. No program will be made effective until all approvals are received.

Please identify below the suggested courses/credit hours to fulfill the General Education curriculum.			
General Education Area		Course	Credit Hrs
I. Intellectual Inquiry (one course in each area)			
Arts and Creativity		<i>choose from list</i>	<u>3</u>
Humanities		<i>choose from list</i>	<u>3</u>
Social Sciences		<i>choose from list</i>	<u>3</u>
Natural/Physical/Mathematical		<u>CHE 105 & 111</u>	<u>5</u>
II. Composition and Communication			
Composition and Communication I		CIS or WRD 110	3
Composition and Communication II		CIS or WRD 111	3
III. Quantitative Reasoning (one course in each area)			
Quantitative Foundations ³		<u>MA 113 OR MA 123 OR MA 137</u>	<u>4</u>
Statistical Inferential Reasoning		<u>STA 296</u>	<u>3</u>
IV. Citizenship (one course in each area)			
Community, Culture and Citizenship in the USA		<u>GEN 100</u>	<u>3</u>
Global Dynamics		<i>choose from list</i>	<u>3</u>
Total General Education Hours			<u>33</u>

3. Explain whether the proposed changes to the program (as described in sections 4 to 12) involve courses offered by another department/program. Routing Signature Log must include approval by faculty of additional department(s).

The proposed change involves courses offered by the Mathematics department. Our most recent curriculum change expanded our Mathematics requirements from "MA 123 OR MA 113 OR 137" to "MA 123 AND MA 162 OR MA 110 AND MA 137". We propose a return to our original curriculum requirement, "MA 123 OR MA 113 OR MA 137".

4. Explain how satisfaction of the University Graduation Writing Requirement will be changed.

Current	Proposed
<input type="checkbox"/> Standard University course offering. List: _____	<input type="checkbox"/> Standard University course offering. List: _____
<input checked="" type="checkbox"/> Specific course – list: <u>WRD-203, Business Writing</u>	<input type="checkbox"/> Specific course) – list: _____

5. List any changes to college-level requirements that must be satisfied.

Current	Proposed
<input checked="" type="checkbox"/> Standard college requirement. List: <u>GEN 100, Issues in Agriculture, Food and Environment, 3 credits</u>	<input checked="" type="checkbox"/> Standard college requirement. List: <u>GEN 100, Issues in Agriculture, Food and Environment, 3 credits</u>
<input type="checkbox"/> Specific required course – list: _____	<input type="checkbox"/> Specific course – list: _____

³ Note that MA 109 is NOT approved as a Quantitative Foundations course. Students in a major requiring calculus will use a calculus course (MA 113, 123, 137 or 138) while students not requiring calculus should take MA 111, PHI 120 or another approved course.

6. List pre-major or pre-professional course requirements that will change, including credit hours.

Current	Proposed
<u>MA 123, Elementary Calculus and Its Applications, 4 credits AND</u> <u>MA 162, Finite Mathematics and Its Applications, 3 credits (total of 7 credits) OR</u> <u>MA 110, Algebra and Trigonometry for Calculus, 4 credits AND</u> <u>MA 137, Calculus I with Life Science Applications, 4 credits (total of 8 credits).</u>	<u>MA 123, Elementary Calculus and Its Applications, 4 credits OR</u> <u>MA 113, Calculus I, 4 credits OR</u> <u>MA 137, Calculus I with Life Science Applications, 4 credits (total of 4 credits).</u>
<u>Total premajor hours---40-41 credits</u>	<u>Total Premajor hours---37 credits</u>

7. List the major's course requirements that will change, including credit hours.

Current	Proposed
_____	<u>No other changes are proposed</u>

8. Does the pgm require a minor AND does the proposed change affect the required minor? N/A Yes No

If "Yes," indicate current courses and proposed changes below.

Current	Proposed
<u>No minor is currently required</u>	<u>No minor is proposed to be required</u>

9. Does the proposed change affect any option(s)? N/A Yes No

If "Yes," indicate current courses and proposed changes below, including credit hours, and also specialties and subspecialties, if any.

Current	Proposed
<u>No options currently exist</u>	<u>No options are proposed</u>

10. Does the change affect pgm requirements for number of credit hrs outside the major subject in a related field? Yes No

If so, indicate current courses and proposed changes below.

Current	Proposed
_____	_____

11. Does the change affect pgm requirements for technical or professional support electives? Yes No

If so, indicate current courses and proposed changes below.

Current	Proposed
_____	<u>No other changes are proposed</u>

12. Does the change affect a minimum number of free credit hours or support electives? Yes No

If "Yes," indicate current courses and proposed changes below.

Current	Proposed
<u>3 free elective credits</u>	<u>6 free elective credits</u>

13. Summary of changes in required credit hours:

	Current	Proposed
a. Credit Hours of Premajor or Preprofessional Courses:	<u>40-41</u>	<u>37</u>

b. Credit Hours of Major's Requirements:	<u>38-42</u>	<u>38-42</u>
c. Credit Hours for Required Minor:	<u>NA</u>	<u>NA</u>
d. Credit Hours Needed for a Specific Option:	<u>NA</u>	<u>NA</u>
e. Credit Hours Outside of Major Subject in Related Field:	<u>NA</u>	<u>NA</u>
f. Credit Hours in Technical or Professional Support Electives:	<u>18-19</u>	<u>18-19</u>
g. Minimum Credit Hours of Free/Supportive Electives:	<u>3</u>	<u>6</u>
h. Total Credit Hours Required by Level:	100: <u>32</u>	<u>32</u>
	200: <u>19</u>	<u>19</u>
	300: <u>14</u>	<u>14</u>
	400-500: <u>21</u>	<u>21</u>
i. Total Credit Hours Required for Graduation:	<u>120</u>	<u>120</u>

14. Rationale for Change(s) – if rationale involves accreditation requirements, please include specific references to that.

The Food Science BS program curriculum requirements have been recently updated, effective Fall 2015. These changes included expanding our Mathematics requirements to include MA 162 and MA 110 per faculty recommendations. MA 110 is a prerequisite for MA 137, while MA 162 was a preferred supplemental course for our Food Science classes.
These changes have already proved difficult for students able to test into MA 137 due to ACT or ALEKS scores, where they are able to pass over the MA 110 prerequisite. Our recently revised curriculum will require frequent course substitutions for missed credit hours, or for those students to take MA 110 instead of registering for MA 137.
Our accredited organization, the Institute of Food Technologists (IFT) requires a minimum of 1 calculus class with 4 credits.

15. List below the typical semester by semester program for the major. If multiple options are available, attach a separate sheet for each option.

YEAR 1 – FALL: (e.g. "BIO 103; 3 credits")	<u>UK CORE, A&C; 3 credits</u> <u>CHE 105; 4 credits</u> <u>CHE 111; 1 credit</u> <u>WRD 110; 3 credits</u> <u>GEN 100; 3 credits</u> <u>Semester total; 14 credits</u>	YEAR 1 – SPRING:	<u>CHE 107; 3 credits</u> <u>CHE 113; 2 credits</u> <u>WRD 111; 3 credits</u> <u>FSC 107; 3 credits</u> <u>DHN 212; 3 credits</u> <u>Semester total; 14 credits</u>
YEAR 2 - FALL :	<u>CHE 236; 3 credits</u> <u>BIO 148; 3 credits</u> <u>ECO 201; 3 credits</u> <u>WRD 203; 3 credits</u> <u>MA 123 or MA 113</u> <u>or MA 137; 4 credits</u> <u>Semester total; 16 credits</u>	YEAR 2 – SPRING:	<u>BIO 152; 3 credits</u> <u>PHY 211; 5 credits</u> <u>STA 296; 3 credits</u> <u>FSC 304; 4 credits</u> <u>BCH 401G; 3 credits</u> <u>Semester total; 18 credits</u>
YEAR 3 - FALL:	<u>AEN 340; 4 credits</u> <u>FSC 306; 4 credits</u> <u>FSC 430; 3 credits</u> <u>ASC 300; 4 credits</u> <u>Semester total; 15 credits</u>	YEAR 3 - SPRING:	<u>UK CORE, Soc Sci; 3 credits</u> <u>FSC 434G; 4 credits</u> <u>BIO 208; 3 credits</u> <u>BIO 209; 2 credits</u> <u>Free elective; 3 credits</u> <u>Semester total; 15 credits</u>

YEAR 4 - FALL:	<u>FSC 399; 3 credits</u> <u>FSC 530; 5 credits</u> <u>FSC 535; 4 credits</u> <u>AEC 305; 3 credits</u> <u>Semester total; 15 hours</u>	YEAR 4 - SPRING:	<u>UK CORE, Hum; 3 credits</u> <u>UK CORE, Glo Dyn; 3 credits</u> <u>Free elective; 3 credits</u> <u>FSC 536; 4 credits</u> <u>FSC 538; 4 credits</u> <u>Semester total; 18 credits</u>
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Signature Routing Log

General Information:

Current Degree Title and Major Name: Bachelor of Science in Food Science; Major--Food Science

Proposal Contact Person Name: Melissa Newman Phone: 7-5881 Email: mnewman@uky.edu

INSTRUCTIONS:

Identify the groups or individuals reviewing the proposal; note the date of approval; offer a contact person for each entry; and obtain signature of person authorized to report approval.

Internal College Approvals and Course Cross-listing Approvals:

Reviewing Group	Date Approved	Contact Person (name/phone/email)	Signature
Food Science Faculty	3-9-2015	Melissa Newman / 7-5881 / mnewman@uky.edu	
Animal and Food Sciences Department		Richard Coffey / 270-365-7541x224 / rcoffey@uky.edu	
Undergraduate Curriculum Committee, College of Agriculture, Food and Environment		Larry J. Grabau / 7-3469 / larry.grabau@uky.edu	
		/ /	
		/ /	

External-to-College Approvals:

Council	Date Approved	Signature	Approval of Revision ⁴
Undergraduate Council			
Graduate Council			
Health Care Colleges Council			
Senate Council Approval		University Senate Approval	

Comments:

⁴ Councils use this space to indicate approval of revisions made subsequent to that council's approval, if deemed necessary by the revising council.

1. General Information

College:	<u>Agriculture, Food and Environment</u>	Department:	<u>Animal and Food Sciences</u>
Current Major Name:	<u>Food Science</u>	Proposed Major Name:	<u>Food Science</u>
Current Degree Title:	<u>Bachelor of Science in Food Science</u>	Proposed Degree Title:	<u>Bachelor of Science in Food Science</u>
Formal Option(s):	<u>N/A</u>	Proposed Formal Option(s):	<u>N/A</u>
Specialty Field w/in Formal Option:	<u>N/A</u>	Proposed Specialty Field w/in Formal Options:	<u>N/A</u>
Date of Contact with Associate Provost for Academic Administration ¹ :	<u>5-5-2015</u>		
Bulletin (yr & pgs):	<u>2015-16, p. 108-109.</u>	CIP Code ¹ :	<u>01.1001</u>
		Today's Date:	<u>5-6-2015</u>
Accrediting Agency (if applicable):	<u>Institute of Food Technologists</u>		
Requested Effective Date:	<input checked="" type="checkbox"/> Semester following approval.	OR	<input type="checkbox"/> Specific Date ² : _____
Dept. Contact Person:	<u>Melissa Newman</u>	Phone:	<u>7-5881</u>
		Email:	<u>mnewman@uky.edu</u>

2. General Education Curriculum for this Program:

The new General Education curriculum is comprised of the equivalent of 30 credit hours of course work. There are, however, some courses that exceed 3 credits & this would result in more than 30 credits in some majors.

- There is no foreign language requirement for the new Gen Ed curriculum.
- There is no General Education Electives requirement.

Please list the courses/credit hours currently used to fulfill the University Studies/General Education curriculum:

Intellectual Inquiry in Arts and Creativity--choose from approved list: 3 credits
Intellectual Inquiry in the Humanities--choose from approved list: 3 credits
Intellectual Inquiry in the Social Sciences--choose from approved list: 3 credits
Intellectual Inquiry in the Natural, Physical and Mathematical Sciences--
CHE 105, General College Chemistry I, 4 credits and
CHE 111, Laboratory to Accompany General Chemistry I, 1 credit
Composition and Communication I, CIS/WRD 110, Composition and Communication I, 3 credits
Composition and Communication II, CIS/WRD 111, Composition and Communication II, 3 credits
Quantitative Foundations--
MA 123, Elementary Calculus and Its Applications, 4 credits, OR MA 113, Calculus I, 4 credits, OR
MA 137, Calculus I With Life Science Applications, 4 credits
Statistical Inferential Reasoning--
STA 296, Statistical Methods and Motivations, 3 credits
Community, Culture and Citizenship in the USA--GEN 100, Issues in Agriculture, Food and Environment, 3 credits
Global Dynamics--choose from approved list: 3 credits
Total UK Core, current--33 credits.

¹ Prior to filling out this form, you MUST contact the Associate Provost for Academic Administration (APAA). If you do not know the CIP code, the (APAA) can provide you with that during the contact.

² Program changes are typically made effective for the semester following approval. No program will be made effective until all approvals are received.

Please identify below the suggested courses/credit hours to fulfill the General Education curriculum.			
General Education Area		Course	Credit Hrs
I. Intellectual Inquiry (one course in each area)			
Arts and Creativity		<i>choose from list</i>	<u>3</u>
Humanities		<i>choose from list</i>	<u>3</u>
Social Sciences		<i>choose from list</i>	<u>3</u>
Natural/Physical/Mathematical		<u>CHE 105 & 111</u>	<u>5</u>
II. Composition and Communication			
Composition and Communication I		CIS or WRD 110	3
Composition and Communication II		CIS or WRD 111	3
III. Quantitative Reasoning (one course in each area)			
Quantitative Foundations ³		<u>MA 113 OR MA 123 OR MA 137</u>	<u>4</u>
Statistical Inferential Reasoning		<u>STA 296</u>	<u>3</u>
IV. Citizenship (one course in each area)			
Community, Culture and Citizenship in the USA		<u>GEN 100</u>	<u>3</u>
Global Dynamics		<i>choose from list</i>	<u>3</u>
Total General Education Hours			<u>33</u>

3. Explain whether the proposed changes to the program (as described in sections 4 to 12) involve courses offered by another department/program. Routing Signature Log must include approval by faculty of additional department(s).

The proposed change is simply to add WRD 203, the required GCCR course, to the program's pre-major listings. This will give the course additional visibility to students, and emphasize that it is the required GCCR choice for FOSC students.

4. Explain how satisfaction of the University Graduation Writing Requirement will be changed.

Current		Proposed	
<input type="checkbox"/> Standard University course offering. List: _____		<input type="checkbox"/> Standard University course offering. List: _____	
<input checked="" type="checkbox"/> Specific course – list: <u>WRD-203, Business Writing</u>		<input checked="" type="checkbox"/> Specific course) – list: <u>WRD-203, Business Writing</u>	

5. List any changes to college-level requirements that must be satisfied.

Current		Proposed	
<input checked="" type="checkbox"/> Standard college requirement. List: <u>GEN 100, Issues in Agriculture, Food and Environment, 3 credits</u>		<input checked="" type="checkbox"/> Standard college requirement. List: <u>GEN 100, Issues in Agriculture, Food and Environment, 3 credits</u>	
<input type="checkbox"/> Specific required course – list: _____		<input type="checkbox"/> Specific course – list: _____	

6. List pre-major or pre-professional course requirements that will change, including credit hours.

³ Note that MA 109 is NOT approved as a Quantitative Foundations course. Students in a major requiring calculus will use a calculus course (MA 113, 123, 137 or 138) while students not requiring calculus should take MA 111, PHI 120 or another approved course.

Current	Proposed
<u>BIO 148, Principles of Biology I, 3 credits</u> <u>BIO 152, Principles of Biology II, 3 credits</u>	<u>BIO 148, Principles of Biology I, 3 credits</u> <u>BIO 152, Principles of Biology II, 3 credits</u>
<u>ECO 201, Principles of Economics I, 3 credits</u>	<u>ECO 201, Principles of Economics I, 3 credits</u>
<u>BIO 208, Principles of Microbiology, 3 credits</u>	<u>BIO 208, Principles of Microbiology, 3 credits</u>
<u>BIO 209, Introductory Microbiology Laboratory, 2 credits</u>	<u>BIO 209, Introductory Microbiology Laboratory, 2 credits</u>
<u>CHE 105, General College Chemistry I, 4 credits</u>	<u>CHE 105, General College Chemistry I, 4 credits</u>
<u>CHE 107, General College Chemistry II, 3 credits</u>	<u>CHE 107, General College Chemistry II, 3 credits</u>
<u>CHE 111, Laboratory to Accompany General Chemistry I, 1 credit</u>	<u>CHE 111, Laboratory to Accompany General Chemistry I, 1 credit</u>
<u>CHE 113, Laboratory to Accompany General Chemistry II, 2 credits</u>	<u>CHE 113, Laboratory to Accompany General Chemistry II, 2 credits</u>
<u>CHE 236, Survey of Organic Chemistry, 3 credits OR</u> <u>CHE 230, Organic Chemistry I, 3 credits</u>	<u>CHE 236, Survey of Organic Chemistry, 3 credits OR</u> <u>CHE 230, Organic Chemistry I, 3 credits</u>
<u>DHN 212, Introductory Nutrition, 3 credits</u>	<u>DHN 212, Introductory Nutrition, 3 credits</u>
<u>MA 123, Elementary Calculus and Its Applications, 4 credits, OR</u>	<u>MA 123, Elementary Calculus and Its Applications, 4 credits, OR</u>
<u>MA 113, Calculus 1, 4 credits, OR</u>	<u>MA 113, Calculus 1, 4 credits, OR</u>
<u>MA 137, Calculus I With Life Science Applications, 4 credits.</u>	<u>MA 137, Calculus I With Life Science Applications, 4 credits.</u>
<u>STA 296, Statistical Methods and Motivations, 3 credits</u>	<u>STA 296, Statistical Methods and Motivations, 3 credits</u>
<u>WRD 203, Business Writing</u>	<u>WRD 203, Business Writing</u>
<u>Total premajor hours--37 credits</u>	<u>Total premajor hours--40 credits</u>

7. List the major's course requirements that will change, including credit hours.

Current	Proposed
	<u>No other changes are proposed</u>

- 8. Does the pgm require a minor AND does the proposed change affect the required minor?** N/A Yes No
If "Yes," indicate current courses and proposed changes below.

Current	Proposed
<u>No minor is currently required</u>	<u>No minor is proposed to be required</u>

- 9. Does the proposed change affect any option(s)?** N/A Yes No
If "Yes," indicate current courses and proposed changes below, including credit hours, and also specialties and subspecialties, if any.

Current	Proposed
<u>No options currently exist</u>	<u>No options are proposed</u>

- 10. Does the change affect pgm requirements for number of credit hrs outside the major subject in a related field?** Yes No
If so, indicate current courses and proposed changes below.

Current	<i>Proposed</i>
_____	_____

- 11. Does the change affect pgm requirements for technical or professional support electives?** Yes No
 If so, indicate current courses and proposed changes below.

Current	<i>Proposed</i>
_____	<i>No other changes are proposed</i>

- 12. Does the change affect a minimum number of free credit hours or support electives?** Yes No
 If "Yes," indicate current courses and proposed changes below.

Current	<i>Proposed</i>
_____	_____

13. Summary of changes in required credit hours:

	Current	<i>Proposed</i>
a. Credit Hours of Premajor or Preprofessional Courses:	<u>40</u>	<u>40</u>
b. Credit Hours of Major's Requirements:	<u>38-42</u>	<u>38-42</u>
c. Credit Hours for Required Minor:	<u>NA</u>	<u>NA</u>
d. Credit Hours Needed for a Specific Option:	<u>NA</u>	<u>NA</u>
e. Credit Hours Outside of Major Subject in Related Field:	<u>NA</u>	<u>NA</u>
f. Credit Hours in Technical or Professional Support Electives:	<u>18-19</u>	<u>18-19</u>
g. Minimum Credit Hours of Free/Supportive Electives:	<u>3</u>	<u>3</u>
h. Total Credit Hours Required by Level:		
	100: <u>32</u>	<u>32</u>
	200: <u>19</u>	<u>19</u>
	300: <u>14</u>	<u>14</u>
	400-500: <u>21</u>	<u>21</u>
i. Total Credit Hours Required for Graduation:	<u>120</u>	<u>120</u>

- 14. Rationale for Change(s) – if rationale involves accreditation requirements, please include specific references to that.**

The Food Science BS program curriculum requirements have been updated, effective Fall 2015, to include the recently approved GCCR requirement. Including our chosen GCCR course, WRD 203, in our premajor requirements will alleviate confusion of which GCCR requirement to select for Food Science students when viewing the general list of GCCR courses.

- 15. List below the typical semester by semester program for the major. If multiple options are available, attach a separate sheet for each option.**

YEAR 1 – FALL: (e.g. "BIO 103; 3 credits")	<u>UK CORE, A&C; 3 credits</u> <u>CHE 105; 4 credits</u> <u>CHE 111; 1 credit</u> <u>WRD 110; 3 credits</u> <u>GEN 100; 3 credits</u> <u>Semester total; 14 credits</u>	YEAR 1 – SPRING:	<u>CHE 107; 3 credits</u> <u>CHE 113; 2 credits</u> <u>WRD 111; 3 credits</u> <u>FSC 107; 3 credits</u> <u>DHN 212; 3 credits</u> <u>Semester total; 14 credits</u>
--	--	-------------------------	--

YEAR 2 - FALL :	<u>CHE 236; 3 credits</u> <u>BIO 148; 3 credits</u> <u>ECO 201; 3 credits</u> <u>WRD 203; 3 credits</u> <u>MA 123 or MA 113</u> <u>or MA 137; 4 credits</u> <u>Semester total; 16 credits</u>	YEAR 2 – SPRING:	<u>BIO 152; 3 credits</u> <u>PHY 211; 5 credits</u> <u>STA 296; 3 credits</u> <u>FSC 304; 4 credits</u> <u>BCH 401G; 3 credits</u> <u>Semester total; 18 credits</u>
YEAR 3 - FALL:	<u>AEN 340; 4 credits</u> <u>FSC 306; 4 credits</u> <u>FSC 430; 3 credits</u> <u>ASC 300; 4 credits</u> <u>Semester total; 15 credits</u>	YEAR 3 - SPRING:	<u>UK CORE, Soc Sci; 3 credits</u> <u>FSC 434G; 4 credits</u> <u>BIO 208; 3 credits</u> <u>BIO 209; 2 credits</u> <u>Free elective; 3 credits</u> <u>Semester total; 15 credits</u>
YEAR 4 - FALL:	<u>FSC 399; 3 credits</u> <u>FSC 530; 5 credits</u> <u>FSC 535; 4 credits</u> <u>AEC 305; 3 credits</u> <u>Semester total; 15 hours</u>	YEAR 4 - SPRING:	<u>UK CORE, Hum; 3 credits</u> <u>UK CORE, Glo Dyn; 3 credits</u> <u>Free elective; 3 credits</u> <u>FSC 536; 4 credits</u> <u>FSC 538; 4 credits</u> <u>Semester total; 18 credits</u>

Signature Routing Log

General Information:

Current Degree Title and Major Name: Bachelor of Science in Food Science; Major--Food Science

Proposal Contact Person Name: Melissa Newman Phone: 7-5881 Email: mnewman@uky.edu

INSTRUCTIONS:

Identify the groups or individuals reviewing the proposal; note the date of approval; offer a contact person for each entry; and obtain signature of person authorized to report approval.

Internal College Approvals and Course Cross-listing Approvals:

Reviewing Group	Date Approved	Contact Person (name/phone/email)	Signature
Food Science Faculty	5-18-2015	Melissa Newman / 7-5881 / mnewman@uky.edu	
Animal and Food Sciences Department		Richard Coffey / 270-365-7541x224 / rcoffey@uky.edu	
Undergraduate Curriculum Committee, College of Agriculture, Food and Environment		Larry J. Grabau / 7-3469 / larry.grabau@uky.edu	
		/ /	
		/ /	

External-to-College Approvals:

Council	Date Approved	Signature	Approval of Revision ⁴
Undergraduate Council			
Graduate Council			
Health Care Colleges Council			
Senate Council Approval		University Senate Approval	

Comments:

⁴ Councils use this space to indicate approval of revisions made subsequent to that council's approval, if deemed necessary by the revising council.

Appendix P

Food Science
Undergraduate
Enrollment (2011-17)

APPENDIX P - Food Science Undergraduate Enrollment (2011-17)

Enrollment Timeseries

Data Source Selector ?

- Institutional
- Regulatory w/ Preliminary
- Regulatory

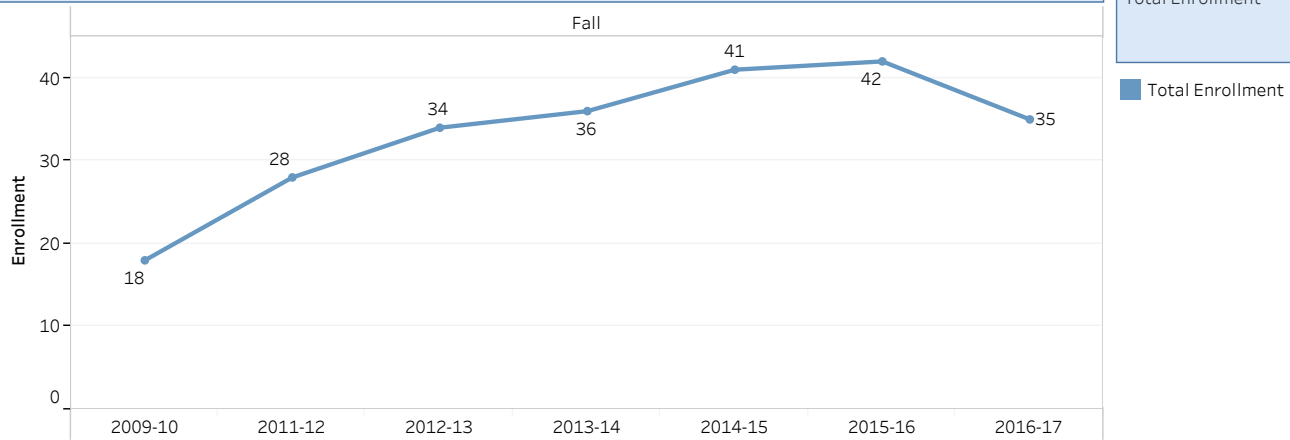
Population of Students Selector
Undergraduate - CPE

Undergraduate - CPE students include those students who are enrolled in a 4- or 5-year Bachelor's degree program, an Associate's degree program, or a technical or vocational program below the baccalaureate level. Students who are non-degree seeking, but taking classes at the undergraduate level, are also included. Students who are auditing all of their classes are included by CPE definition, whereas they are not in the IPEDS definition.

Semester Fall
College Ag, Food and Environment
Department Animal and Food Sciences
Primary Major Food Science
Degree Level All
Degree Type All
Full/Part Time All
Ethnicity All
Gender All
Residency All

Timeseries by Total Enrollment

Split Population of Students By
Total Enrollment



Timeseries Numbers by Total Enrollment

	Semester / Academic Year						
	2009-10	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Total Enrollment	18	28	34	36	41	42	35
Grand Total	18	28	34	36	41	42	35

Appendix Q

Food Science Undergraduate Student Retention Rates (2011-15)

APPENDIX Q - Food Science Undergraduate Student Retention Rates (2011-15)

Institutional Retention and Graduation Rates with Preliminary Data

These charts give the numbers and percentages of students within the cohort who retained or graduated from the University of Kentucky.

To reset College, Department and Major filters, select (All) in each category.

College (1st Fall Primary)
Ag, Food and Environment

Department (1st Fall Primary)
Animal and Food Sciences

Major (1st Fall Primary)
Food Science

Retention and Graduation Numbers

Cohort Term	Cohort Size	Cohort Size with Exclusions	Retained 1st Spring	Retained 2nd Fall	Retained 3rd Fall	Retained 4th Fall	Retained 5th Fall	Graduated 4 Years	Graduated 5 Years	Graduated 6 Years
Fall 2007	1	1	1.00	1.00	0.00	0.00		0.00	0.00	0.00
Fall 2008	3	3	3.00	2.00	2.00	2.00		1.00	1.00	1.00
Fall 2009	5	5	5.00	5.00	5.00	5.00	0.00	5.00	5.00	5.00
Fall 2010	4	4	2.00	2.00	2.00	2.00	2.00	1.00	2.00	2.00
Fall 2011	2	2	2.00	2.00	2.00	2.00	1.00	1.00	2.00	
Fall 2012	6	5	6.00	5.00	5.00	5.00	0.00	3.00		
Fall 2013	9	9	7.00	6.00	5.00	4.00	1.00			
Fall 2014	15	15	14.00	13.00	13.00	11.00				
Fall 2015	5	5	5.00	2.00	1.00					

Retention and Graduation Rates

Cohort Term	Cohort Size	Cohort Size with Exclusions	Retained % 1st Spring	Retained % 2nd Fall	Retained % 3rd Fall	Retained % 4th Fall	Retained % 5th Fall	Graduated % 4 Years	Graduated % 5 Years	Graduated % 6 Years
Fall 2007	1	1	100.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%
Fall 2008	3	3	100.0%	66.7%	66.7%	66.7%		33.3%	33.3%	33.3%
Fall 2009	5	5	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%
Fall 2010	4	4	50.0%	50.0%	50.0%	50.0%	50.0%	25.0%	50.0%	50.0%
Fall 2011	2	2	100.0%	100.0%	100.0%	100.0%	50.0%	50.0%	100.0%	
Fall 2012	6	5	100.0%	83.3%	83.3%	83.3%	0.0%	60.0%		
Fall 2013	9	9	77.8%	66.7%	55.6%	44.4%	11.1%			
Fall 2014	15	15	93.3%	86.7%	86.7%	73.3%				
Fall 2015	5	5	100.0%	40.0%	20.0%					

Residency All	Gender All
Ethnicity All	Underrepresented Minority All
Pell Recipient All	First Generation All
LLP Resident All	KY Appalachian County All
UK Service Area All	First Scholars All
Honors Student All	Parker Scholarship All
Robinson Scholarship All	University Scholar All
CARES All	APP English All
APP Math All	APP Reading All
Is Graduated (Y/N) All	Is Campus Housing All
IS_STUDENT_SUPPORT_SE.. All	Is Freshman Summer Program All

* For various reasons, some students are excluded from the official cohort so as to give more accurate retention and graduation calculations (i.e. those students who enter a professional school before completing their undergraduate degree).

Appendix R

Food Science Academic
Enrichment Experience
Learning Contracts



COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Internship Program LEARNING CONTRACT

- 1. Please complete this contract with your faculty advisor.
- 2. Complete contracts must include student signature, faculty sponsor, and department chair approval. (Associate Dean Approval is no longer required for Departmental Internship Courses)
- 3. Upon completion with department approval, submit your complete contract to N8 Advising Resource Center for registration into your internship course.

Questions? Contact [Amanda Saha](mailto:Amanda.Saha@uky.edu), Director Career Development & Academic Enrichment
Amanda.saha@uky.edu or 859-257-3468

Student Information

Course Information

Student Name: _____

Semester/Year: _____

E-mail: _____

Course: _____

Phone: _____

Credit Hours: _____

Address: _____

City/ST/Zip: _____

Major: _____

College: _____

Class Level: _____

Student Number (not SSN): _____

Internship Partner Information

Hours

Organization/Company Name: _____

Starting Date: _____

Supervisor's Name: _____

Ending Date: _____

E-mail: _____

Total Number of Weeks: _____

Phone: _____

Average Hours Per Week: _____

Address: _____

Total Hours Worked: _____

City/ST/Zip: _____

Describe the duties of your internship:

List your learning objectives for this experience:

(What do you expect to learn from this experience? Objectives should be measurable and achievable.)

Specify the assignments agreed upon with your faculty sponsor:

(Assignments are usually reflective in nature.)

Specify dates and times you have agreed to meet with your faculty sponsor for critical reflection:

(Dates/times may be specific or in general terms. "To Be Determined" is not acceptable.)

Faculty Sponsor:

Department:

Campus Address:

Phone:

E-mail:

Department Chair:

Department:

Campus Address:

Faculty Sponsor Signature
Date

Date Department Chair Signature

Student Signature

Date



Undergraduate Independent Study Contract

Student Name: _____ SID (not SSN): _____

Course (prefix, course no.): _____ Semester (Year/Term): _____

Faculty Mentor: _____ Credit Hours: _____

Research/Project Title: _____

Learning goals:

General description of methods to be employed:

Anticipated project or research results:

Product student is to provide, including due date:

Grading expectations:

Arrangements for student-faculty member interactions:

Must be completed and submitted no later than the last day to add a class in any term. Please sign below by entering your name, e-mail address, and phone number.

Student: _____
(full name, e-mail address, phone number)

Faculty Mentor: _____
(full name, e-mail address, phone number)

Distribution of electronic copies via e-mail: i) student, ii) faculty mentor, iii) DUS for the student's program, and iv) Office of Academic Programs, Emily Morgan, (Emily.Morgan@uky.edu).

AAA/SACS/10-13/Indep 12-08-2011

Appendix S

Original Equine Science
and Management
Curriculum (2009-13)



Equine Science and Management

College of Agriculture, Food and Environment
and School of Human Environmental Sciences

The horse industry is a dynamic industry that encompasses not only the breeding, raising and training of horses but also the development of activities for the use of the horse in sports and recreation. The industry has a significant economic impact across the U.S. and world-wide.

Equine science and management involves the study and application of science and business concepts to the horse industry. Additional course work supports learning in areas that aid in breeding and raising horses and marketing the industry. Students come from varied equine backgrounds but have a common interest in the horse. Regardless of which breed of horse or activity focus students have, equine science and management majors will have the opportunity to combine their interest in the horse with a desire to become active participants in the horse industry by selecting either the equine science option or the equine management option.

The equine science option is for students who have a primary interest in horse production. The equine management option is designed for students who are interested in the business aspect of the horse industry. Students in equine science and management considering a career in veterinary medicine or graduate research can meet those goals in the degree program as well. Interested students need to consult with an advisor to ensure all specific academic requirements are met.

Career Opportunities

The horse industry is continually changing. Equine science and management graduates are needed in all aspects of the industry including production, business management and other related support industries.

Graduation Requirements

To earn the Bachelor of Science in Equine Science and Management, the student must have a minimum of 120 credit hours with at least a 2.0 grade-point average. A minimum of 45 credit hours must be from upper division courses (300 level and above). Remedial courses may **not** be counted toward the total hours required for the degree.

Plan of Study

As an equine science and management major you are required to develop an acceptable **Plan of Study** during your sophomore year for your junior and senior years. The plan must be signed by your advisor and returned to the Office of the Associate Dean for Academic Programs.

If you are an upper division transfer student (from another university or from another UK college or department) then you will submit your plan during the first semester you are enrolled in the program.

Students must complete the following:

College Required Hours

*GEN 100 Issues in Agriculture 3

Subtotal: College Required hours 3

**Required for all first semester Freshmen. Students who transfer into the College and have already completed the UK Core U.S. Citizenship requirement are not required to take GEN 100.*

UK Core Requirements

See the *UK Core* section of the *2013-2014 Undergraduate Bulletin* for the complete UK Core requirements. The courses listed below are (a) recommended by the college, or (b) required courses that also fulfill UK Core areas. Students should work closely with their advisor to complete the UK Core requirements.

I. Intellectual Inquiry in Arts and Creativity

Choose one course from approved list 3

II. Intellectual Inquiry in the Humanities

Choose one course from approved list 3

III. Intellectual Inquiry in the Social Sciences

Choose one course from approved list 3

IV. Intellectual Inquiry in the Natural, Physical, and Mathematical Sciences

*CHE 105 General College Chemistry I 4

*CHE 111 Laboratory to Accompany General Chemistry I 1

V. Composition and Communication I

CIS/WRD 110 Composition and Communication I 3

VI. Composition and Communication II

CIS/WRD 111 Composition and Communication II 3

VII. Quantitative Foundations

MA 123 Elementary Calculus and Its Applications

or

MA 113 Calculus I 4

VIII. Statistical Inferential Reasoning

STA 210 Making Sense of Uncertainty:

An Introduction to Statistical Reasoning 3

IX. Community, Culture and Citizenship in the USA

GEN 100 Issues in Agriculture 3

X. Global Dynamics

Choose one course from approved list 3

UK Core hours 32

**CHE 105/111 are part of the premajor requirement for Option A: Equine Science. Students pursuing Option B: Equine Management should choose from the approved list of courses to fulfill this area.*

Graduation Writing Requirement

After attaining sophomore status, students must complete a Graduation Writing Requirement course. Please see your academic advisor for courses that meet this requirement.

Graduation Writing Requirement hours 3

- CONTINUED -

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Equine Science and Management • 2

Option A: Equine Science

Premajor Requirements

BIO 150 Principles of Biology I	3
BIO 152 Principles of Biology II	3
CHE 105 General College Chemistry I	4
CHE 107 General College Chemistry II	3
CHE 111 Laboratory to Accompany General Chemistry I	1
CHE 113 Laboratory to Accompany General Chemistry II	2
ECO 201 Principles of Economics I	3
MA 123 Elementary Calculus and Its Applications	
or	
MA 113 Calculus I	4
Subtotal: Premajor hours	23

Major Requirements

ASC 101 Domestic Animal Biology	3
EQM 101 Introduction to the Horse and the Horse Industry	2
EQM 105 Equine Behavior and Handling	2
ASC 310 Equine Anatomy	2
ASC 320 Equine Management	3
EQM 351 Equine Health and Diseases	3
EQM 399 Equine Science and Management Internship	3
ASC 410G Equine Science	3
EQM 490 Capstone in Equine Science and Management	3
AEC 302 Agricultural Management Principles	4
Subtotal: Major hours	28

Option A Hours

CHE 236 Survey of Organic Chemistry	3
ASC 325 Animal Physiology	3
ASC 364 Reproductive Physiology of Farm Animals	4
ASC 378 Animal Nutrition and Feeding	4
PLS 366 Fundamentals of Soil Science	4
PLS 510 Forage Management and Utilization	3
Subtotal: Option A hours	21

Specialty Support Requirement

The student will choose, in consultation with an advisor, at least 18 hours of courses at the 200 level or above that will strengthen the program in an area of importance to the student. To aid in developing this area of study, a list of suggested courses is available to advisors. The list includes courses in animal sciences, plant and soil sciences, biosystems and agricultural engineering, agricultural economics plus other areas of study at UK.

Subtotal: Option A Specialty Support	18
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Electives

Electives should be selected by the student to lead to the minimum total of 120 hours required for graduation

Subtotal: Electives	minimum of 4
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Total Minimum Hours for Program	120
--	------------

Option B: Equine Management

Premajor Requirements

BIO 150 Principles of Biology I	3
BIO 152 Principles of Biology II	3
*CHE 104 Introductory General Chemistry	3
*CHE 106 Introduction to Inorganic, Organic and Biochemistry	4
ECO 201 Principles of Economics I	3
MA 123 Elementary Calculus and Its Applications	
or	
MA 113 Calculus I	4
Subtotal: Premajor hours	20

**This sequence of chemistry courses will not satisfy requirements for admission to Veterinary School. Consult your advisor for more details.*

Major Requirements

ASC 101 Domestic Animal Biology	3
EQM 101 Introduction to the Horse and the Horse Industry	2
EQM 105 Equine Behavior and Handling	2
ASC 310 Equine Anatomy	2
ASC 320 Equine Management	3
EQM 351 Equine Health and Diseases	3
EQM 399 Equine Science and Management Internship	3
ASC 410G Equine Science	3
EQM 490 Capstone in Equine Science and Management	3
AEC 302 Agricultural Management Principles	4
Subtotal: Major hours	28

Option B Hours

STA 291 Statistical Methods	3
ACC 201 Financial Accounting I	3
ECO 202 Principles of Economics II	3
MKT 300 Marketing Management	3
AEC 305 Food and Agricultural Marketing Principles	3
AEC 320 Agriculture Product Marketing and Sales	3
HMT 320 Hospitality and Tourism Marketing	3
Subtotal: Option B hours	21

Specialty Support Requirement

The student will choose, in consultation with an advisor, at least 18 hours of courses at the 200 level or above that will strengthen the program in an area of importance to the student. To aid in developing this area of study, a list of suggested courses is available to advisors. The list includes courses in animal sciences, plant and soil sciences, biosystems and agricultural engineering, agricultural economics plus other areas of study at UK.

Subtotal: Option B Specialty Support	18
---	-----------

Electives

Electives should be selected by the student to lead to the minimum total of 120 hours required for graduation

Subtotal: Electives	minimum of 4
----------------------------------	---------------------

Total Minimum Hours for Program	120
--	------------

Appendix T

Current Equine Science and Management Curriculum (2014-17)



Equine Science and Management

College of Agriculture, Food and Environment

The horse industry is a dynamic industry that encompasses not only the breeding, raising and training of horses but also the development of activities for the use of the horse in sports and recreation. The industry has a significant economic impact across the U.S. and world-wide.

Equine science and management involves the study and application of science and business concepts to the horse industry. Additional course work supports learning in areas that aid in breeding and raising horses and marketing the industry. Students come from varied equine backgrounds but have a common interest in the horse. Regardless of which breed of horse or activity focus students have, equine science and management majors will have the opportunity to combine their interest in the horse with a desire to become active participants in the horse industry.

Students in equine science and management considering a career in veterinary medicine or graduate research can meet those goals in the degree program as well. Interested students need to consult with an advisor to ensure all specific academic requirements are met.

Career Opportunities

The horse industry is continually changing. Equine science and management graduates are needed in all aspects of the industry including production, business management and other related support industries.

Graduation Requirements

To earn the Bachelor of Science in Equine Science and Management, the student must have a minimum of 120 credit hours with at least a 2.0 grade-point average. A minimum of 45 credit hours must be from upper division courses (300 level and above). Remedial courses may **not** be counted toward the total hours required for the degree.

Students must complete the following:

UK Core Requirements

See the *UK Core* section of the 2016-2017 *Undergraduate Bulletin* for the complete UK Core requirements. The courses listed below are (a) recommended by the college, or (b) required courses that also fulfill UK Core areas. Students should work closely with their advisor to complete the UK Core requirements.

I. Intellectual Inquiry in Arts and Creativity

Choose one course from approved list 3

II. Intellectual Inquiry in the Humanities

Choose one course from approved list 3

III. Intellectual Inquiry in the Social Sciences

Choose one course from approved list 3

IV. Intellectual Inquiry in the Natural, Physical, and Mathematical Sciences

Choose course(s) from approved list 3-5

V. Composition and Communication I

CIS/WRD 110 Composition and Communication I 3

VI. Composition and Communication II

CIS/WRD 111 Composition and Communication II 3

VII. Quantitative Foundations

MA 123 Elementary Calculus and Its Applications

or

MA 113 Calculus I

or

MA 137 Calculus I with Life Science Applications 4

VIII. Statistical Inferential Reasoning

STA 210 Making Sense of Uncertainty:

An Introduction to Statistical Reasoning 3

IX. Community, Culture and Citizenship in the USA

GEN 100 Issues in Agriculture, Food and Environment 3

X. Global Dynamics

Choose one course from approved list 3

UK Core hours **30-32**

Graduation Composition and Communication Requirement (GCCR)

WRD 203 Business Writing

or

WRD 204 Technical Writing 3

Graduation Composition and Communication Requirement hours (GCCR)

..... **3**

Premajor Requirements

BIO 148 Introductory Biology I 3

BIO 152 Principles of Biology II 3

CHE 105 General College Chemistry I

CHE 107 General College Chemistry II

CHE 111 Laboratory to Accompany General Chemistry I

CHE 113 Laboratory to Accompany General Chemistry II 10

OR

CHE 104 Introductory General Chemistry

CHE 108 Introduction to Inorganic, Organic and

Biochemistry without Laboratory 6

OR

CHE 105 General College Chemistry I

CHE 108 Introduction to Inorganic, Organic and

Biochemistry without Laboratory 7

ECO 201 Principles of Economics I 3

MA 123 Elementary Calculus and Its Applications

or

MA 113 Calculus I 4

Subtotal: Premajor hours **19-23**

—CONTINUED—

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Equine Science and Management • 2

Major Requirements

ASC 101 Domestic Animal Biology	3
EQM 101 Introduction to the Horse and the Horse Industry	2
EQM 105 Equine Behavior and Handling	2
ASC 310 Equine Anatomy	2
ASC 320 Equine Management	3
EQM 351 Equine Health and Diseases	3
EQM 399 Equine Science and Management Internship	3
EQM 490 Capstone in Equine Science and Management	3
AEC 302 Agricultural Management Principles	4
Subtotal: Major hours	25

Emphasis Areas

Students must have one emphasis area. In order to have an emphasis area, students must take 9 credits in one area. Students will then select 12 additional credits from any emphasis area:

Community Leadership and Development

Students who are interested in leadership roles in business, breed associations or non-profit equine organizations and cooperative extension should consider this area. They will enhance their communication skills and be required to take courses in community dynamics, leadership development, and agriculture communication.

CLD 100 Introduction to Community and Leadership Development	1
CLD 102 The Dynamics of Rural Social Life	3
CLD 225 Community and Communication: Exploring Their Intersections	3
CLD 230 Intrapersonal Leadership	3
CLD 260 Community Portraits	3
CLD 401 Principles of Cooperative Extension	3
EQM 300 Topics in Equine Science and Management	1-6

Equine Business

Students will learn skills related to marketing, operations, and management of equine businesses. This will prepare students for careers as farm managers as well as business managers for equine enterprises, breed associations, and sales associates. This area also introduces them to the diversity of the equine industry through courses in equine law, sales, careers, event planning, marketing, and human resources.

*AEC 300 Special Topics in Agricultural Economics (Subtitle required)	3
AEC 305 Food and Agricultural Marketing Principles	3
AEC 320 Agricultural Product Marketing and Sales or	
MKT 300 Marketing Management	3
AEC 324 Agricultural Law	3
AEC 325 Equine Law	3
AEC 340 Human Resource Management in Agriculture	3
EQM 106 Introduction to Careers in the Equine Industry	1
EQM 205 Equine Career Preparation	1
EQM 300 Topics in Equine Science and Management	1-6
EQM 301 Thoroughbred Sales	1
EQM 302 Equine Event Planning	1

Equine Science

This area will provide the students with a strong background in basic sciences which will prepare them for graduate school or careers such as laboratory research assistants, breeding technicians, pharmaceutical sales representatives, and technical representatives for the feed industry.

ASC 311 Advanced Equine Evaluation	1
ASC 325 Animal Physiology	3
ASC 362 Animal Breeding and Genetics	4
ASC 364 Reproductive Physiology of Farm Animals	4
ASC 378 Animal Nutrition and Feeding	4
ASC 389 Advanced Equine Nutrition and Feeding	2
ASC 410G Equine Science	3
EQM 300 Topics in Equine Science and Management	1-6
VS 307 Genetics of Horses	3
VS 500 Advanced Equine Reproduction	3

Forage/Pasture

Students will obtain knowledge in agronomic practices focusing on pasture and forage management. This area will prepare students for careers related to general horse farm management or graduate school. These students will take courses in soil composition and fertility, forages, weed identification and control, and pest management.

EQM 300 Topics in Equine Science and Management	1-6
PLS 366 Fundamentals of Soil Science	4
PLS 404 Integrated Weed Management	4
PLS 468G Soil Use and Management	3
PLS 470G Soil Nutrient Management	3
PLS 510 Forage Management and Utilization	3
PLS 531 Field Schools in Crop Pest Management	2

Subtotal: Emphasis hours 21

**When offered under a subtitle with a focus on equine marketing.*

Specialty Support Requirement

The student will choose, in consultation with an advisor, at least 18 hours of courses at the 200 level or above that will strengthen the program in an area of importance to the student. To aid in developing this area of study, a list of suggested courses is available from your advisor. The list includes courses in agricultural economics, animal sciences, community and leadership development, marketing, management, finance, plant and soil sciences plus other areas of study at UK.

Subtotal: Specialty Support 18

Electives

Electives should be selected by the student to lead to the minimum total of 120 hours required for graduation

Subtotal: Electives minimum of 6

Total Minimum Hours for Program 120

Appendix U

Enrollment History in
Major Requirement and
Emphasis Area Courses
in the Equine Science
and Management
Program that are
Taught by Animal and
Food Sciences Faculty

APPENDIX U - Enrollment History in Major Requirement and Emphasis Area Courses in the Equine Science and Management Program that are Taught by Animal and Food Sciences Faculty

Table 1: Enrollment and course offerings for Major Requirement and Emphasis Area courses taught by Animal and Food Sciences faculty in the ESMA program*

	F11	Sp12	Su12	F12	Sp13	Su13	F13	Sp14	Su14	F14	Sp15	Su15	F15	Sp16	Su16	F16	Sp17	Su17
ASC 101	215 (97)	—	—	237 (87)	—	—	288 (87)	—	—	299 (111)	—	—	329 (122)	—	—	208 (31)	104 (69)	—
ASC 310	—	54 (43)	—	—	63 (57)	—	—	61 (47)	—	44 (32)	66 (49)	—	42 (33)	47 (64)	—	44 (30)	61 (40)	—
ASC 311	—	—	—	—	—	—	13 (11)	—	—	6 (5)	—	—	13 (11)	—	—	13 (13)	—	—
ASC 320	65 (56)	30 ⁵ (0)	5 ⁵ (1)	64 (53)	32 ⁵ (1)	8 ⁵ (1)	68 (62)	29 ⁵ (1)	7 ⁵ (1)	68 (59)	—	4 (0)	69 (51)	—	—	68 (47)	—	—
ASC 325	74 (17)	—	—	91 (24)	—	—	61 (18)	—	—	101 (22)	—	—	116 (27)	—	—	115 (30)	—	—
ASC 362	—	52 (3)	—	—	51 (2)	—	—	41 (1)	—	—	59 (2)	—	—	55 (2)	—	—	64 (7)	—
ASC 364	—	62 (13)	—	—	75 (20)	—	—	71 (15)	—	—	95 (25)	—	—	92 (12)	—	—	70 (20)	—
ASC 378	76 (16)	—	—	57 (18)	—	—	73 (19)	—	—	94 (29)	—	—	111 (17)	—	—	117 (11)	—	—
ASC 389	—	21 ⁶ (6)	—	—	27 (12)	—	—	25 (5)	—	—	29 (11)	—	—	30 (12)	—	—	26 (7)	—
ASC 410G	—	58 (35)	—	—	69 (31)	—	3 (3)	69 (39)	2 (2)	2 (2)	73 (48)	—	—	49 (17)	—	—	25 (9)	—
EQM 101	110 (98)	—	—	105 (94)	—	—	104 (92)	—	—	130 (115)	—	—	130 (121)	—	—	118 (109)	35 (29)	—
EQM 105	—	65 (59)	—	—	64 (60)	—	—	80 (76)	—	—	90 (79)	—	—	86 (83)	—	—	79 (72)	—
EQM 106	—	44 ⁴ (36)	—	—	47 ⁴ (43)	—	—	47 ⁴ (43)	—	—	52 (48)	—	—	58 (49)	—	41 (35)	52 (50)	—
EQM 205	21 ⁴ (20)	—	—	11 ⁴ (10)	—	—	17 ⁴ (15)	—	—	19 (17)	—	—	—	—	—	31 (28)	—	—
EQM 300¹	—	—	—	—	—	—	—	39 ⁶ (35)	—	—	38 ⁶ (34)	—	—	34 (32)	—	—	46 (43)	—
EQM 300²	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15 (14)	—	—
EQM 300³	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11 (6)	—

EQM 301	___	___	___	___	38 ⁶ (36)	___	___	42 ⁶ (40)	___	___	47 (40)	___	___	45 (38)	___	___	54 (51)	___
EQM 302	___	___	___	___	13 ⁶ (9)	___	___	13 ⁶ (8)	___	___	15 (15)	___	___	14 (12)	___	___	17 (16)	___
EQM 351	44 (37)	___	___	37 (33)	___	___	57 (51)	48 (42)	___	___	59 (46)	___	___	60 (55)	___	___	45 (40)	___
EQM 399	17 (16)	10 (10)	1 (1)	25 (24)	16 (15)	___	22 (20)	21 (20)	___	36 (33)	19 (16)	___	32 (32)	24 (21)	___	36 (34)	10 (10)	___
EQM 490	20 (19)	17 (17)	___	16 (16)	22 (20)	___	17 (17)	19 (17)	___	39 (39)	28 (26)	___	35 (34)	24 (22)	___	22 (22)	29 (27)	___
GEN 109	___	___	___	___	___	___	___	38 (33)	___	44 (38)	___	___	47 (42)	___	___	___	___	___

¹Equine Facilities Design and Management

²Animal Behavior

³Equine Study Abroad Trip

⁴Course taught as a section of GEN 109

⁵Section taught online only

⁶Course taught as a section of GEN 300

*Values are total enrollment with the numbers in parentheses being the number of students with ESMA as their primary major enrolled in the course

Appendix V

Miscellaneous Data for EQM Program and Students

APPENDIX V – Miscellaneous Data for ESMA Program and Students

Demographics of Students in the ESMA Degree Program (2011-17)						
Semester	Percent Receiving Pell grants	Percent in the Honors College	Percent First Generation	Percent Male/ Female	Percent Resident/ Non-Resident	Percent International
Fall 2011	15.3	1.8	11.3	15.3/84.7	47.3/52.7	1.4
Spring 2012	16.0	2.1	10.8	13.4/86.6	43.3/56.7	2.1
Fall 2012	18.6	2.9	11.2	14.0/86.0	36.0/64.0	2.5
Spring 2013	19.9	3.1	15.5	15.0/85.0	37.2/62.8	1.8
Fall 2013	17.7	2.6	14.3	15.0/85.0	36.1/63.9	2.3
Spring 2014	19.0	3.2	12.5	16.5/83.5	34.3/65.7	2.0
Fall 2014	17.1	4.4	10.8	14.0/86.0	31.1/68.9	1.9
Spring 2015	16.8	4.0	12.0	14.2/85.8	32.8/67.2	1.8
Fall 2015	18.8	3.6	10.6	13.3/86.7	27.9/72.1	1.2
Spring 2016	15.8	3.5	10.9	13.7/86.3	26.0/74.0	1.8
Fall 2016	13.6	2.9	9.4	12.0/88.0	25.3/74.7	1.0
Spring 2017	13.3	3.0	10.0	11.5/88.5	25.6/74.4	0.7

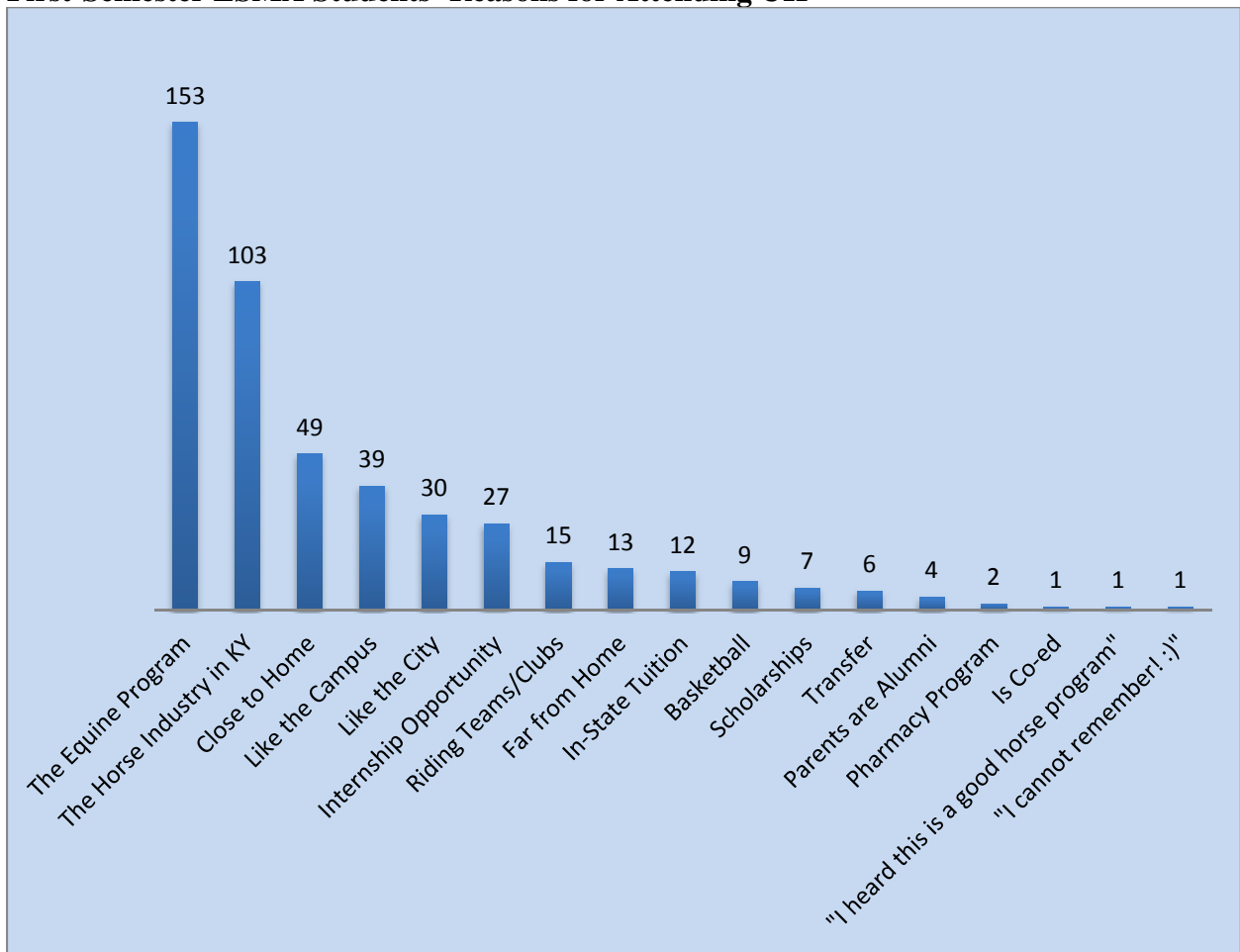
**Demographic information is based on the census date for each semester; includes both primary and secondary ESMA majors

Ethnicity of Students in the ESMA Program							
Semester	Asian	Black or African American	Hispanic or Latino	Non-Resident Alien	Race and Ethnicity Unknown	Two or More Races	White
Fall 2011	0	1 (0.5%)	5 (2.3%)	3 (1.4%)	8 (3.6%)	5 (2.3%)	200 (90.1%)
Spring 2012	0	0	5 (2.6%)	4 (2.1%)	7 (3.6%)	7 (2.3%)	171 (88.1%)
Fall 2012	0	1 (0.4%)	4 (1.7%)	6 (2.5%)	6 (1.5%)	5 (2.1%)	220 (90.9%)
Spring 2013	0	1 (0.4%)	5 (2.2%)	4 (1.8%)	6 (2.7%)	5 (2.2%)	205 (90.7%)
Fall 2013	1 (0.4%)	3 (1.1%)	6 (2.3%)	6 (2.3%)	9 (3.4%)	7 (2.6%)	234 (88.0%)
Spring 2014	1 (0.4%)	4 (1.6%)	6 (2.4%)	5 (2.0%)	10 (4.0%)	8 (3.2%)	214 (86.3%)
Fall 2014	1 (0.3%)	8 (2.5%)	13 (4.1%)	6 (1.9%)	13 (4.1%)	6 (1.9%)	288 (85.1%)
Spring 2015	1 (0.4%)	7 (2.6%)	8 (2.9%)	5 (1.8%)	11 (4.0%)	5 (1.8%)	237 (86.5%)
Fall 2015	1 (0.3%)	10 (3.0%)	14 (4.2%)	4 (1.2%)	16 (4.8%)	5 (1.5%)	280 (84.8%)
Spring 2016	1 (0.4%)	9 (3.2%)	12 (4.2%)	5 (1.8%)	13 (4.6%)	5 (1.8%)	240 (84.2%)
Fall 2016	0	9 (2.9%)	18 (5.8%)	3 (1.0%)	14 (4.5%)	9 (2.9%)	255 (82.8%)
Spring 2017	0	4 (1.5%)	14 (5.2%)	2 (0.7%)	11 (4.1%)	9 (3.3%)	230 (85.2%)

**Demographic information is based on the census date for each semester; includes both primary and secondary ESMA majors

Academic Summary of Freshmen Students Entering the ESMA Program		
Semester	Average Unweighted High School GPA	Average ACT Score
Fall 2011	3.5	25.6
Fall 2012	3.5	25.9
Fall 2013	3.5	25.3
Fall 2014	3.4	25.3
Fall 2015	3.4	25.3
Fall 2016	3.4	24.3

First-Semester ESMA Students' Reasons for Attending UK

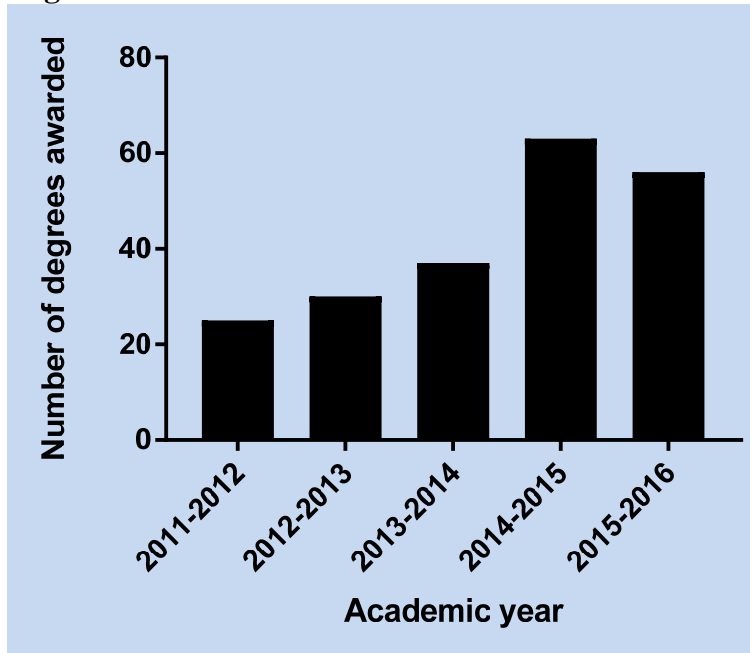


University Retention and Graduation Rates for ESMA Major								
Cohort	First Fall Enrollment (N)	Retained % 1st Spring	Retained % 2nd Fall	Retained % 3rd Fall	Retained % 4th Fall	Retained % 5th Fall	Graduated % 4 years	Graduated % 5 years
Fall 2011	62	88.7	79.0	80.6	74.2	25.8	52.5	56.8
Fall 2012	66	89.4	75.8	71.2	68.2	15.2	56.1	
Fall 2013	58	91.4	82.8	77.6	72.4	25.9		
Fall 2014	81	93.8	86.4	79.0	66.7			
Fall 2015	92	93.5	77.2	73.9				
Fall 2016	80	92.5	82.5					

College Retention and Graduation Rates for ESMA Major

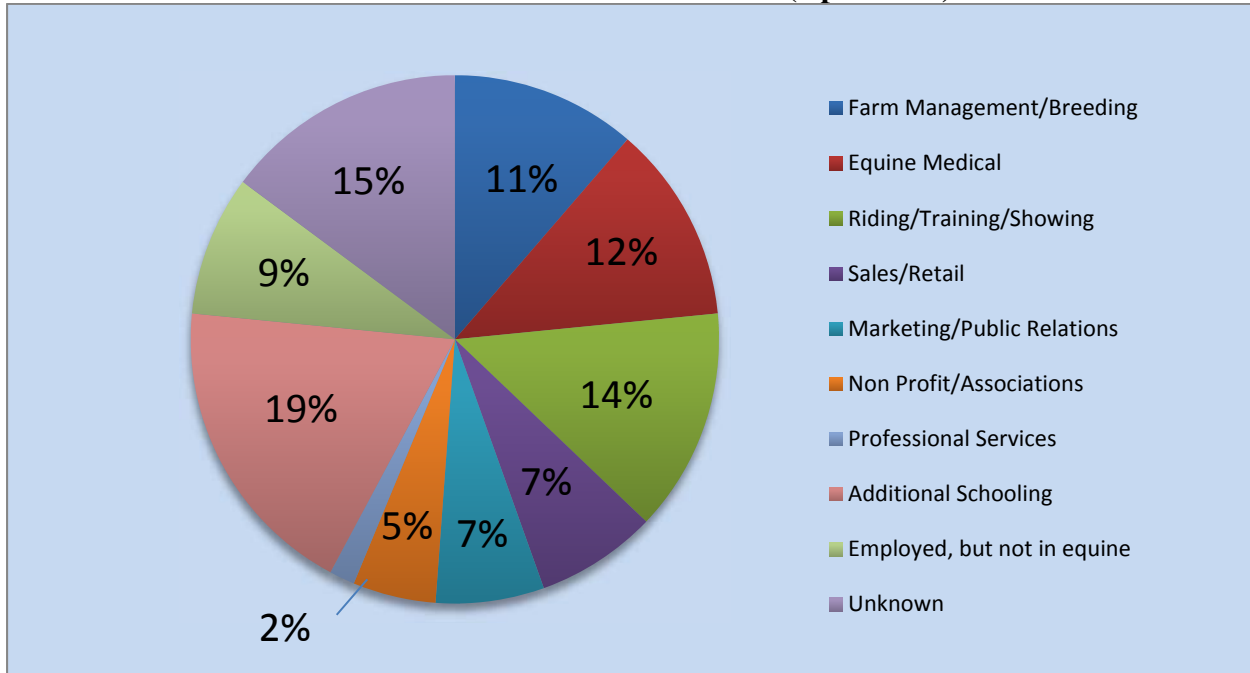
Cohort	First Fall Enrollment (N)	Retained % 1st Spring	Retained % 2nd Fall	Retained % 3rd Fall	Retained % 4th Fall	Retained % 5th Fall	Graduated % 4 years	Graduated % 5 years
Fall 2011	62	88.7	75.8	71.0	62.9	19.4	45.9	59.0
Fall 2012	66	86.4	63.6	54.5	50.0	7.6	45.5	
Fall 2013	58	87.9	75.9	63.8	55.2	19.0		
Fall 2014	81	92.6	82.7	70.4	61.7			
Fall 2015	92	89.1	70.7	64.1				
Fall 2016	80	85.0	73.8					

Degrees Awarded to ESMA Students



Time and Credit Hours to Degree Completion for Students Graduating in 2011-16					
Item	2011-12	2012-13	2013-14	2014-15	2015-16
Average years to degree completion	3.89	3.83	4.07	3.84	3.88
Average credit hours to degree completion	129.7	131.9	134.6	133.5	137.0

Career Placement After Graduation for ESMA Students (April 2017)



Enrollment in EQM 399 ^a	
Semester	Enrollment in EQM 399
Fall 2011	17
Spring 2012	10
Fall 2012	24
Spring 2013	16
Fall 2013	22
Spring 2014	21
Fall 2014	36
Spring 2015	19
Fall 2015	32
Spring 2016	24
Fall 2016	35
Spring 2017	10

^aEQM 399 – Equine Science and Management Internship course

Internship Sites for EQM 399 in 2016-17

Semester	Internship sites*
Spring 2016	Claiborne Farm Cobra Farm Denali Stud Equissentials Riding Breeches Gluck Equine Research Center Hagyard Equine Medical Hoffmeier Farm Hunterton Farm KESMARC Lynn Imaging Millennium Farms Punchestown Stable River Mountain Farm Rood and Riddle Equine Hospital Santangelo Racing Stables Taylor Made Farm Trackside Farm Winstar Farm
Fall 2016	Ballyhigh Show Stables Camp Tecumseh YMCA Central Kentucky Riding for Hope Cornerstone Cowley Insurance Agency December Farm Double H Ranch Eaton Sales Equibase Equine Reproduction Concepts Flying Z Stables Fraley Equine Podiatry Gluck Equine Research Center Heritage Horse Farm Hillcroft Farm Jonmil Farm Kentucky Horse Park KESMARC Lane's End Farm Maine Chance Farm Mary Delaney Farm Olive Hill Sporthorses Park Equine Hospital Patterson Veterinary Supply Prospect Lane Quillin Leather and Tack River Mountain Farm Shawhan Place Sovereign Farm USEF Vinery Sales Visiting Vet

Internship Sites for EQM 399 in 2016-17	
Semester	Internship sites*
	Wellex Sport Horses Inc Winstar Farm
Spring 2017	Ballyhigh Show Stables Claiborne Farm Cobra Farm Meadow Lake Equestrian Center Parrish Hill Farm Rood and Riddle Equine Hospital Safe Haven Equine Ministries Central Kentucky Riding for Hope Sovereign Farm Breeder's Cup Matt Martinez
Fall 2017 (to date)	Big R Farms Bloodhorse Publications Canon Hill Veterinary Clinic Central Kentucky Riding for Hope Cloud Nine Farm Cornerstone Gluck Equine Research Center Iristrac Jockey Club Keller Performance Horses Kentucky Horse Park Lexington Equine Surgery and Sports Medicine Mackinac Island Carriage Tours Majestic Star Stable Maker's Mark Secretariat Center Miramonte Equine Old Stone Riding Center Park Equine Hospital Shawhan Place Spy Coast Farm Steps and Strides Equestrian Services Susanne Kersebaum Sylvan Dale Guest Rance The Bloodhorse

*Note: some internship host sites may have had more than 1 student in any given semester

Recipients of the ESMA Intern of the Year and Internship Host of the Year Awards		
Year	Intern of the Year recipient	Internship Host of the Year recipient
2012	Claire Willis (site: Kentucky 4-H Horse Program)	N/A
2013	Colton Woods (site: Lariata Ranch; Legacy of Legends Intern Program)	Bryan Cassill (site: AFS Maine Chance Farm)
2014	Madison Scott (site: Shawhan Place)	Max Hodge (site: Fasig-Tipton)
2015	Allison Henshaw (site: United States Equestrian Federation)	Matt Koch (site: Shawhan Place)
2016	Jamie Norris (site: Gluck Equine Research Center)	Allison Rogers (site: Hagyard Equine Medical Institute)

Dean's List Recognition of ESMA Students		
Semester	Number of students on Dean's List	Percent of ESMA students on Dean's List*
Fall 2011	31	14.0%
Spring 2012	26	13.4%
Fall 2012	44	18.1%
Spring 2013	47	20.8%
Fall 2013	61	22.9%
Spring 2014	45	18.1%
Fall 2014	79	25.0%
Spring 2015	76	27.7%
Fall 2015	92	27.8%
Spring 2016	71	24.9%
Fall 2016	91	29.5%
Spring 2017	73	27.0%

*Percentages calculated based on the total number of students enrolled on the census date for each semester

CAFE Scholarships Received by ESMA Students		
Academic Year	Dollars awarded	Number of scholarship recipients
2011-2012	\$54,000	43
2012-2013	\$14,450	6
2013-2014	\$58,750	44
2014-2015	\$58,500	41
2015-2016	\$64,350	49
2016-2017	\$27,300	24
2017-2018	\$44,250	36

Undergraduate Student Research Recognition

- Marie Noel- UK Oswald Research and Creativity Program Awards (2nd place, Biological Sciences) (2017)
- Alessandra Campana-Emard- Equine Science Society Undergraduate Student Competition Finalist (2017)
- Chelsea Folmar- American Society of Dairy Science Undergraduate Student Production Division (1st place) (2017)
- Sarah Sivinski- Equine Science Society Undergraduate Student Competition Finalist (2015)

Gamma Sigma Delta Outstanding Undergraduate Student Awards

- Sarah Sivinski (2015)- Outstanding Senior
- Curren Prettyman (2014)- Outstanding Senior
- Jennifer Brogie (2011)- Outstanding Sophomore

External Scholarships

- Julianna Witt- The Jockey Club Scholarship (2017)
- Julianna Witt- Christine Comella Brown Equine Scholarship (2016)
- Colton Woods – Legacy of Legends Scholarship (2013)
- Madison Scott- Rood & Riddle Equine Hospital Scholarship (2013)
- Jillian Gordon – Rood & Riddle Equine Hospital Scholarship (2011, 2012)
- Jennifer Brogie – Ted Bassett Leadership Award (2012)
- Virginia Stilwell – Rood & Riddle Equine Hospital Scholarship (2011)

Acceptance into Competitive Internship or Training Programs

- Madison Scott- Godolphin Flying Start (2016)
- Courtney Schneider- Irish National Stud Breeding Course (2016)
- Jackson Buchanon- Darley Flying Start (2015)
- Jacob Memolo- Irish National Stud Breeding Course (2015)
- Hallie Hardy – Darley Flying Start (2014)
- Natalie Heitz – Darley Flying Start (2012)

Awards and recognition for ESMA Alumni

- Natalie Voss (2010 Alumni)- Media Eclipse Award for Writing in the News/Enterprise (2016)
- Jennifer Brogie (2013 Alumni)- US Army Medical Department Veterinary Corps Scholarship (2014)

Appendix W

Samples of Direct and Indirect EQM Assessment Tools

Tools Name _____

EQM 490

Assessment of Knowledge

Fall 2012

Circle the letter of the most correct answer.

1. A negative Coggins test, taken two months ago, indicates ?.
 - a. There is no possibility that the horse has equine infectious anemia today
 - b. The horse had no antibodies to equine viral arthritis at the time of the test
 - c. The horse is immune to equine infectious anemia
 - d. The horse had no antibodies to equine infectious anemia at the time of the test
2. Why should booster vaccinations be administered to a pregnant mare approximately 30 days before parturition?
 - a. It will increase the vigor of the neonatal foal
 - b. It will increase the mare's antibody titers resulting in increased passive immunity in the foal
 - c. It will calm the mare in preparation for delivery of the foal
 - d. It results in a prolonged active immunity in the foal until weaning
3. An anthelmintic with larvacidal effect has the advantage over non-larvacidal anthelmintics in that it ?.
 - a. Is lower in toxicity
 - b. Breaks up the life cycle of the parasites
 - c. Prevents parasite resistance to the drug
 - d. Can kill small strongyles encysted in muscle tissue
4. The normal rectal temperature in degrees Fahrenheit of a resting horse in a non-heat stressed environment is ?.
 - a. 98.5
 - b. 100.5
 - c. 102.5
 - d. 103.5
5. The normal heart rate in beats per minute of a resting horse is ?.
 - a. 15
 - b. 30
 - c. 45
 - d. 60
6. What is the term for the male donkey?
 - a. Mule
 - b. Jack
 - c. Stallion
 - d. Jenny
7. The average length of estrus in the mare is ?.
 - a. 24 hours
 - b. 3 days
 - c. 5 - 7 days
 - d. 21 days

8. The draft horse breed with little feathering on its legs and typically black or gray in color is the ?.
 - a. Suffolk
 - b. Belgian
 - c. Clydesdale
 - d. Percheron

9. What class of hormones is produced by the corpus luteum?
 - a. Progestins
 - b. Prostaglandins
 - c. Gonadotropins
 - d. Androgens

10. Ovulation occurs in the mare ?.
 - a. 24 - 48 hours after the end of estrus
 - b. 12 hours after the end of estrus
 - c. 24 - 48 hours after the start of estrus
 - d. 24 - 48 hours before the end of estrus

11. The endocrine organ that appears to modulate seasonality of mares is the ?.
 - a. Pituitary gland
 - b. Adrenal gland
 - c. Pineal gland
 - d. Ovary

12. The protein supplement with the highest lysine content and, therefore, the most appropriate for maximum foal growth is ?.
 - a. Linseed meal
 - b. Cottonseed meal
 - c. Soybean meal
 - d. Urea

13. Which vitamin is most closely related with calcium and phosphorus absorption?
 - a. Vitamin A
 - b. Biotin
 - c. Vitamin C
 - d. Vitamin D

14. Generally, as forages mature, their ?.
 - a. Protein content increases
 - b. Content of calcium and phosphorus increases
 - c. Structural carbohydrates (fiber) become increasingly lignified
 - d. Content of digestible energy increases

15. Ingesting which forage during the last three months of gestation can result in dystocia and stillbirths?
 - a. Red clover
 - b. Birds foot trefoil
 - c. Tall fescue
 - d. Bermuda grass

16. The quantity of blood pumped by the horse's heart into the aorta in one minute is ?.
- The cardiac output
 - The stroke volume
 - The venous return
 - The cardiac index
17. One of the effects of training on the horse is ?.
- A decrease in the horse's maximum heart rate
 - A decrease in the length of time required for the post exercise heart rate to return to normal
 - An increase in the horse's maximum heart rate
 - An increase in the horse's resting heart rate
18. The distance traveled between successive impacts of the left hind hoof is called the ?.
- Gait
 - Stride duration
 - Stride velocity
 - Stride length
19. The two major contractile muscle proteins are ?.
- Fibronectin and elastin
 - Troponin and fibrin
 - Actin and myosin
 - Fibrinogen and myosin
20. Packed cell volume is a measurement of the ?.
- Clean, colorless liquid produced by the lymphatic system
 - Quantity of leukocytes present in the total blood volume
 - Amount of plasma present in the total blood volume
 - Quantity of red blood cells present in the total blood volume
21. The genetic consequence of inbreeding is ?.
- Increased homozygosity
 - Increased traits related to fitness
 - Cover up recessive genes
 - Both a and b are correct
22. Which condition is often caused by poorly maintained stalls with consistently wet dirty bedding?
- Quarter crack
 - Seedy toe
 - Thrush
 - Laminitis
23. The area between the horse's stifle and hock is commonly called the ?.
- Flank
 - Cannon
 - Pastern
 - Gaskin

24. All of the following are found on a feed tag except ? .
- Digestible energy
 - Fiber
 - Crude protein
 - Fat
25. In which breed is HYPP most prominent?
- Arabians
 - Morgans
 - Quarter horses
 - Standardbreds
26. Which of the following ailments could possibly affect the second metacarpal bone?
- Bucked shins
 - Navicular disease
 - Ring bone
 - Splints
27. Which disorder is most often observed in young race horses (2 years of age) that are overworked?
- Bowed tendons
 - Bucked shins
 - Splints
 - Navicular disease
28. When a new horse is introduced into a pasture and a "pecking order" or social hierarchy is established with the other horses, what type of behavior is being demonstrated?
- Epimeletic
 - Et-Epimeletic
 - Agonistic
 - Allelomemetic
29. An organ that functions mainly to process nutrients absorbed from the digestive tract is the ? .
- Liver
 - Heart
 - Spleen
 - Kidney
30. One of America's oldest breeds, developed from the offspring of a single horse, is the ? .
- Morgan
 - Quarter Horse
 - American Saddlebred
 - Tennessee Walking Horse

Senior Capstone Presentation, Project Evaluation Form, EQM 490, April, 2015

First, please tell us why you are here.

___ I am a guest (faculty/staff/stakeholder)

Presentation Topic: _____

___ I am a student in EQM 490 (Name: _____)

___ I am here for other reasons—if so, please specify: _____

Next, please respond to each of the items below by circling the number corresponding to your evaluation of the student in each category. Use the following rankings—“4” for exceptional, “3” for good, “2” for fair, and “1” for marginal. If you are not in a position to make an evaluation for a given item, please circle “N/A”, meaning “not applicable”.

	<u>Marginal</u>		<u>Exceptional</u>		
	1	2	3	4	
1. The student clearly communicated the purpose of his/her project.	1	2	3	4	N/A
2. The speaker was effective.	1	2	3	4	N/A
3. The speaker was engaging.	1	2	3	4	N/A
4. If used, the visual aids (power point, posters, etc...) were clear, crisp, and contributed to the flow of the presentation.	1	2	3	4	N/A
5. The flow of the presentation was easy to follow.	1	2	3	4	N/A
6. The topic presented by the student was well-supported by the research/credible resources.	1	2	3	4	N/A
7. The student’s answers to questions showed a good grasp of knowledge of the topic.	1	2	3	4	N/A
8. The student effectively communicated this equine industry related topic in oral and visual formats to the audience present.	1	2	3	4	N/A
9. The student was successfully able to formulate and coherently support positions and derive solutions to the topic presented.	1	2	3	4	N/A
10. Please note any additional comments about the presentation/project you have below -					

Name: _____

EQM 101 – Industry Survey

1. How old are you? (circle one)
 - 18-24
 - 25-34
 - 35-44
 - 45-54
 - 55-64
 - 65 +
2. Are you? (circle one)
 - Male
 - Female
3. What year are you? (circle one)
 - Freshman
 - Sophomore
 - Junior
 - Senior
 - Transfer
4. What 5-digit zip code are you from? (circle one)
 - 00000-09999 CT, MA, ME, NH, NJ, RI, VT
 - 10000-19999 DE, NY, PA
 - 20000-29999 DC, MD, NC, SC, VA, WV
 - 30000-39999 AL, FL, GA, MS, TN
 - 30000-49999 IN, KY, MI, OH
 - 50000-59999 IA, MN, MT, ND, SD, WI
 - 60000-69999 IL, KS, MO, NE
 - 70000-79999 AR, LA, OK, TX
 - 80000-89999 AZ, CO, ID, NM, NV, UT, WY
 - 90000-99999 AK, CA, HI, OR, WA
5. What is your career goal involvement in the equine industry? (circle one)
 - Barn/Farm manager
 - Breeder
 - Competitive rider
 - Farrier
 - Horse owner
 - Lease a horse
 - Manufacturer, distributor, sales of equine products/services
 - Operate a boarding stable
 - Pleasure rider
 - Riding instructor
 - Trainer
 - Veterinarian
 - Veterinary student or tech
 - Other (please specify)

6. How many horses do you or members of your household currently: (please fill in the blank)
 Own? _____
 Lease? _____
 Manage? _____
7. Based on your answer in #6, how do these numbers of horses you **own** compare the number you owned in 2009? (please circle one)
 More
 Less
 Same
8. Based on your answer in #6 how do the number of horses you **lease** compare the number you leased in 2009? (please circle one)
 More
 Less
 Same
9. Based on your answer in #6 how do the number of horses you **manage** compare the number you managed in 2009? (please circle one)
 More
 Less
 Same
10. How many horses over 15 years of age do you (please fill in blank)
 Own? _____
 Manage? _____
 Lease? _____
11. Do you care for your own horse?
 Yes No
 Do you board your own horse on someone else's property?
 Yes No
 Do you pay for riding lessons?
 Yes No
 Do you pay for someone else to train your horse?
 Yes No
12. If you board your horse, who makes the health care decisions for your horse? (circle one)
 Barn manager
 You/horse owner
 Vet
 Combination
 Other (please specify)
13. Do you deworm your horse?
 Yes
 No
14. Where do you get your horse health information? (circle all that apply)
 Magazine
 Online
 Veterinarian
 Farrier
 Friends/other horse owners
 Other

15. How do you use your horses? (circle all that apply)
- Barrel racing
 - Breeding
 - Breed shows
 - Combined
 - Cutting
 - Dressage
 - Driving
 - Endurance
 - Fox hunting
 - Hunters
 - Jumpers
 - Lessons/Training
 - Natural Horsemanship
 - Pleasure/Trail Riding
 - Polo
 - Racing
 - Reining
 - Rodeo
 - Roping
 - Saddle seat
 - Steeple chasing
 - Team Penning
 - Working
 - Other (please specify)
16. Do you expect your expenses related to the horse to ____ in the next two years. (circle one)
- Increase
 - Decrease
 - Stay the same
17. If you expect expenses to increase, how will you cope with that change? (circle all that apply)
- Reduce spending in other areas of my life
 - Reduce spending on my horses
 - Reduce the number of horses
 - Increase income
 - Lease "part" of my horse(s) to someone
 - Other (please specify)
18. In your position, what are the top three issues facing the equine industry? (circle those that apply)
- Unwanted horses and what to do with them
 - Overburdened welfare groups
 - Owners who don't understand horses
 - Horses that aren't trained appropriately
 - Lack of educational materials on horses
 - Cost of horse keeping
 - Loss of trails and riding areas
 - Horses going to slaughter
 - Ineffective welfare laws
 - No marketing for the overall industry to entice new owners
 - Lack of unified voice in Washington
 - Competition for open spaces from development, producers of biofuels, etc.
 - Other

NAME: _____

Completion of this evaluation is required as part of your team project. Responses will not be shared with your team members.

1. Please list each of your team members in the blanks provided below. Then evaluate each team member and yourself based on their/your contributions to the overall project/team and list each component of the project that team member was responsible for.

Name	Overall Rating					Project Responsibilities/Contributions
	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT	
Self	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	
	1	2	3	4	5	

2. Use the following categories to assess the degree to which you agree or disagree with each of your fellow students and your individual contributions during the team project.

- 1 – Strongly Disagree
- 2 – Disagree
- 3 – Agree
- 4 – Strongly Agree

Category	Students' Names (List all team members in the blanks provided below)				
	Self				
Regularly attended group meetings, was punctual and co-operative.					
Contributed ideas and suggestions for the project.					
Listened to the partner's ideas and suggestions.					
Carried out the task assigned by the group.					
Accepted a fair share of the work.					
TOTAL Points (Add up each column)					

3. What about your team (people, mindsets, behaviors) contributed to your team's ability to successfully complete your project?

4. What areas (if any) do you think your team could have worked better together?

5. Please rate your overall experience in working with your team on this project. (Select one)

- 1 – Poor
- 2 – Fair
- 3 – Good
- 4 – Very Good
- 5 - Excellent

6. Please evaluate the degree to which you agree or disagree with each of the statements below BEFORE and AFTER working on this team project. (Select one BEFORE and one AFTER score for each item listed.)

	BEFORE					AFTER				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Listening to other people’s ideas is important.	1	2	3	4	5	1	2	3	4	5
It is important to ask questions of your team members.	1	2	3	4	5	1	2	3	4	5
Team members should be willing to question each other and rethink ideas.	1	2	3	4	5	1	2	3	4	5
It is important to treat each other with respect and support one another.	1	2	3	4	5	1	2	3	4	5
Team members should contribute to all aspects of a team project in some way.	1	2	3	4	5	1	2	3	4	5
Good communication is essential for a team to work effectively.	1	2	3	4	5	1	2	3	4	5

Equine Internship: Supervisor Evaluation

Please complete the evaluation below of the intern you supervised.

Would you like your evaluation to be kept confidential? Yes No

Name					
Title					
Address					
City, State, Zip					
E-mail					
Phone					
Business					
Intern Name					
1-5 (1=Strongly disagree; 5=Strongly agree)					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The intern was reliable.					
The intern was hard working.					
The intern's skills improved over the course of the internship.					
The intern communicated well with others.					
The intern was professional.					
The intern was willing to learn.					
The intern contributed positively to this organization.					
If an appropriate job opened I would hire this intern.					

Would you recommend hiring this intern to another business or organization? _____

Why or why not? _____

Would you be interested in taking another intern? _____

Why or why not? _____

What could be changed to make supervising an intern a better experience? _____

Additional Comments: _____

(Signature & Date)

Equine Science and Management Degree Exit Interview Survey

Option (Please circle one): Equine Science Equine Management

Name: _____

Permanent Address: _____

Permanent Phone Number: _____

Non UK Email: _____

1. Post-graduation plans: (mark all that apply)

Employment-full time

Graduate or professional school-full time

Employment-part time

Graduate or professional school- part time

Military service

Volunteer activity

Additional undergraduate course work

2. If you are going to be employed, in what type of position will you have?(mark all that apply)

Position with an equine enterprise or business

Position with a non-equine enterprise or business

Working for a public/private equine agency

Management position on a horse farm

Work with family operation

Start my own business (what type?): _____

Other: _____

(Equine enterprise of business = feed company, tack and equipment etc.)

(Horse farm could be a breeding, training or boarding type facility)

3. ONLY answer if you completed question #2:

Organization/Company Name:

Type of job assignment:

Location:

Starting Salary:

Under \$20,000

\$20,000 to \$24,999

\$25,000 - \$29,999

\$30,000 - \$34,999
\$35,000 - \$39,999
\$40,000 - \$44,999
\$45,000 - \$49,999
\$50,000-\$59,999
\$60,000 or and over

4. If you are planning to attend graduate or professional school, please indicate which school and area of study.

5. How many offers of employment or graduate/professional school acceptance did you receive as a result of your interview(s)?

0

1

2

Other: _____

6. Which resources assisted you in locating the jobs/schools you applied for? (mark all that apply)

Family/Friends

Direct contact with company

College of Ag Career Fair

Equine Programs Career Fair

University Career Services

Internship/Co-Op Experience

UK Faculty/Staff (Name: _____)

7. What equine clubs/teams within the College of Ag were you a member of while here at UK?
(Check all that apply)

Hunt Seat Team

Western Team

Saddle Seat Team

R.E.A.D. Club

Horse Racing Club

Polo Team

Dressage and Eventing Team

Rodeo Team

Other (Ex: Ag Ambassador/Pre-Vet Club): _____

8. Please rate your quality of instruction you received while here at UK. (Circle one for each item)

	Poor	Fair	Good	Very Good	Excellent
University	1	2	3	4	5
College of Ag	1	2	3	4	5
Major	1	2	3	4	5

9. What additional courses would you have liked to see the Equine Program offer?

10. What is your overall rating of the guidance you received from your advisor concerning your future and plan of study?

Poor

Fair

Good

Very Good

Excellent

11. How could we have made your advising experience better/more helpful?

12. What are the most important skills and/or knowledge you have gained as a result of completing your degree?

13. In your opinion, what could be done to improve the Equine Science and Management B.S. degree programs?

Appendix X

Additional Information
about Equine Clubs and
Teams

University of Kentucky Equine Clubs and Teams

	Dressage and Eventing Team	Horse Racing Club	IHSA Team Hunt Seat	IHSA Team Western Seat	Polo Team	R.E.A.D. (Research in Equine and Agricultural Disciplines Club)	Saddle Seat Team	Rodeo Team
Advisor	Dr. Jill Stowe (859) 218-1652 jill.stowe@uky.edu	Dr. Laurie Lawrence (859) 257-7509 llawrenc@uky.edu	Dr. Bob Coleman (859)257-9451 rcoleman@uky.edu	Dr. Bob Coleman (859) 257-9451 rcoleman@uky.edu	Dr. Roger Brown (859) 257-7257 rogerbrown@uky.edu	Dr. Kristine Urschel (859) 257-7748 klur222@uky.edu	Dr. Mary Rossano (859) 257-7552 mary.rossano@uky.edu	Monty Ott monty.ott@uky.edu
President	Lexie Samuels alexandra.samuels41@gmail.com	Sidney Boots & Julie Witt ukhorseracingclub@gmail.com	Mackenzie Mentzer Uk.equestrianteam@gmail.com	Sydney Hull sydney.hull@uky.edu	Ben Lynch benjamin.lynch@uky.edu	Katie Simmons kesi226@g.uky.edu	Audrey Schneider uksaddleseatteam@gmail.com	Shane Halbleib Spha227@uky.edu 831-234-5920
Coach	Maria Elvira Montalvo Mariaemontalvo93@gmail.com	N/A	Diana Conlon olivehillsporthorses@gmail.com	Bennie Sargent btsquarter@aol.com	Jorge Vasquez Jorge@lexingtonpolo.com	N/A	Stephanie Sedlacko Stephanie.sedlacko@wingsweptfarm.com	<u>Roping/Timed Events:</u> Johnathan Blackburn blackburn351@gmail.com <u>Barrel Racing:</u> Kelley Murphy Alley kell0189@yahoo.com <u>Rough-Stock:</u> Jimmie Marshall jimmar42@gmail.com
Farm	Serenity Springs Farm, LLC Nicholasville, KY	N/A	Olive Hill Sporthorses Lexington, KY	Bennie Sargent Quarter Horses Paris, KY	West Wind Stables Lexington, KY	N/A	Wingswept Farm Nicholasville, KY	Striking KMA Performance Horses
Meetings	bimonthly	once a month	weekly	weekly	once a month	once a month	monthly/bimonthly	monthly
Costs Per Semester <small>(As of Summer 2017)</small>	\$40 dues \$50 per lesson \$65 competitions	\$15/semester or \$25/year	\$475 for dues and lessons \$30 per class at horse shows	\$425 for dues and lessons \$30 per class at horse shows	\$1,500 Varsity Dues \$500 Club Dues \$20/lesson for private lessons	\$10/year	\$150 dues \$120 for 4 lessons \$120 each show	Non Competing Membership: \$25 dues/semester Competing Membership: \$150 for dues & practice fee/semester \$260 NIRA Card/year (needed to compete)
Lessons	2 times a month	N/A	once a week	Once a week	2-3 times a week	N/A	2-3 time a month	2-4 practices/week
Competitions	3 Fall/4 Spring	N/A	4 horse shows = 4 classes per semester	4 horse shows = 4 classes per semester	8 Fall/8 Spring	N/A	2 Fall/3 Spring	Maximum of 5 rodeos/semester
Field Trips	2 Fall/2 Spring	3 Fall/3 Spring	N/A	N/A	4 Fall/4 Spring	once a month	N/A	N/A

For more information about our equine clubs and teams, please visit <http://www2.ca.uky.edu/equine/>

Appendix Y

Auburn Requirements
for Pre-Vet Students
(2016-17)

APPENDIX Y – Auburn Requirements for Pre-Vet Students (2016-17)

Subject to Change – Always Check with Pre-Vet Advisor

Course	Sem. Hrs	Note
BIO 148 BIO 152 Two labs	3 3	See pre-vet advisor for approved biology lab options.
BIO 315	4	BIO 304 pre-requisite.
CHE 105 and 111 CHE 107 and 113	4/1 3/2	
CHE 230 CHE 231 (lab) CHE 232 CHE 233 (lab) BCH 401G	3 1 3 1 3	CHE 230, 232 are prerequisites.
PHY 211(with lab)	5	
ASC 378	3	Fall semester only. Check w/ advisor about alternatives.
Sciences electives MUST BE FROM THOSE LISTED:	6	Genetics (BIO 304), Physiology (BIO 350 or ASC 325), Microbiology (BIO 308), Histology (BIO 542), Parasitology (BIO 561 or BIO 563), Embryology (BIO 529), Repro Physiology (ASC 364), Immunology (BIO 494), PHY 213. Should be taken within 6 years of application.

The following courses are waived for students with BS or BA degrees:

Written Composition:	6	Completion of UK's written communications requirement. Transfer students should check with Pre-Vet advisor.
Humanities & Fine Arts:		
Literature	3 [or 6] *	ENG 261/262; ENG 331/332; ENG 334/335; ask advisor.
Fine Arts	3	Art History courses, MUS 100, MUS 201, TA 101 or other courses emphasizing history and appreciation of art, music, theatre and dance. These MUST be lecture-only classes.
Humanities/Fine Arts electives	6	In addition to literature, examples of humanities are philosophy, religion, COM 181, foreign languages.
History, Social & Behavioral Sciences:		
History	3 [or 6] *	HIS 108/109; HIS 104/105; HIS 106/107; or ask advisor.
Social/Behavioral Science electives	9	Examples are anthropology, economics, geography, political science, psychology and sociology, AEC 101, CLD 102.
Mathematics:	3	MA 123 or MA 113

*[Students must complete a 6 semester credits sequence either in literature or in history. Examples: 2 semesters of American History + 1 literature course *OR* 2 semesters in European literature + 1 history course.]

- Advanced placement credit for required courses needs to be approved by Dr. Dwyer.
- Online classes may not be acceptable to veterinary schools. Approve all online classes with Dr. Dwyer.
- The final grade in each required course must be a "C" or better.

PREVET LISTSERV

ALL pre-vet students being advised through UK must sign up for the pre-vet listserv. Send an email to listserv@lsv.uky.edu. The text of the message is *subscribe ukprevet-L yourfirstname yourlastname*. You must use your UK e-mail address.

Dr. Roberta Dwyer
(859) 218-1122, rmdwyer@uky.edu
All office hours by appointment

Ms. Colette Tebeau
(859) 257-7551, Colette.Tebeau@uky.edu
All office hours by appointment

Visit www.aavmc.org/vmcas/vmcas.htm for information on all North American veterinary schools.

Read: <http://www.uky.edu/pre-vet>; and <http://www.vetmed.auburn.edu/>

Appendix Z

Tuskegee Requirements for Pre-Vet Students (2017-18)

APPENDIX Z - Tuskegee Requirements for Pre-Vet Students (2017-18)

Subject to Change – Always Check with Pre-Vet Advisor

Course	Sem. Hrs	Note
BIO 150 or BIO 148	3	Not specifically required, but needed as prerequisite course
BIO 152	3	
Biology Labs 155	1	
CHE 105 and 111	4/1	Not specifically required, but needed as prerequisite course
CHE 107 and 113	3/2	
CHE 230	3	CHE 230, 232 are prerequisites.
CHE 231 (lab)	1	
CHE 232	3	
CHE 233 (lab)	1	
BCH 401G	3	
PHY 211 & 213	8	
ASC 378	3	Fall semester only. Check w/ advisor about alternatives.
ASC 101	3	
Med Term	1	ASC 209 or CLA 131
Advanced Biology	9	Genetics (BIO 304), Physiology (BIO 350), Microbiology (BIO 308/309), Histology (BIO 542), Parasitology (BIO 561 or BIO 563), Embryology (BIO 529), Immunology (BIO 494), Cell Biology (BIO 315)
Free Elective	6	Physiology (ASC 325), Repro Physiology (ASC 364), advanced classes (production) or advanced bio classes above (cannot double credit for prerequisites). Science courses must be taken within six years of application.

Non-Science Requirements

Written Composition or Communication :	6	Completion of UK's written communications requirement. Transfer students should check with Pre-Vet advisor
Liberal Arts	6	See Pre-Vet advisor
Social Science and Humanities	6	History, sociology, psychology
Mathematics (algebra or trigonometry)	6	See Pre-Vet advisor

- Advanced placement credit for required courses needs to be approved by Dr. Dwyer.
- The final grade in each required course must be a "C" or better.
- All prerequisites MUST be completed **before** VMCAS application.

PREVET LISTSERV

ALL pre-vet students being advised through UK must sign up for the pre-vet listserv. Send an email to listserv@lsv.uky.edu . The text of the message is *subscribe ukprevet-L yourfirstname yourlastname* . You must use your UK e-mail address.

Dr. Roberta Dwyer
(859) 218-1122, rdwyer@uky.edu
All office hours by appointment

Ms. Colette Tebeau
(859) 257-7551, Colette.Tebeau@uky.edu
All office hours by appointment

Visit www.aavmc.org/vmcas/vmcas.htm for information on all North American veterinary schools.

Read: <http://www.uky.edu/prevet> and http://www.onemedicine.tuskegee.edu/CVM_TU/admissions.htm

Appendix AA

Confirming Course
Equivalencies for The
Ohio State University

**APPENDIX AA - Confirming Course Equivalencies for
The Ohio State University**

The Ohio State University CVM - Prerequisite Evaluation (2017)*

THE OHIO STATE UNIVERSITY	University of Kentucky
Biochemistry 4511	BCH 401
Microbiology 4000	BIO 208 and BIO 209 <u>or</u> BIO 308 and BIO 209 or 309
Physiology 3200	ASC 325 , BIO 350 or PGY 412G (1 st 2 are animal 3 rd is human)
Communication 2110 or 2131	COM 287, GEN 100 or if the student completes the newly implemented “Graduation Composition and Communication Requirement” the requirement should be filled.
Science Electives	Includes, but not limited to: Biology, chemistry, anatomy, immunology, cell biology, molecular genetics, animal science, ecology, environmental science or other science courses.
Humanities/Social Science Electives	Includes, but not limited to: History, economics, anthropology, psychology, art, sociology, music, literature, languages, writing, and ethics.

Source: 2014-15 University of Kentucky Bulletin

***Subject to change---students interested in applying to OSU are responsible for reading their direct website for any changes!**

From Dr. Dwyer (October 11, 2016):

The above equivalents were provided by The Ohio State University in response to my inquiry about their new requirements for 2015 applicants

<http://vet.osu.edu/education/dvm-admissions/prerequisites>

- 1) While the semester hours for biochemistry are listed as 3-10 at the OSU website, OSU has approved BCH 401 (3 credit hours) to fulfill that requirement.
- 2) Microbiology must be taken with a lab. While OSU will accept BIO 208, please note that some other veterinary schools will only accept BIO 308 for Microbiology (including Auburn).
- 3) While the semester hours for physiology are listed as 5-10 at the OSU website, OSU has approved ASC 325 or BIO 350 or PGY 412 for completion of this requirement (3-4 credits).
- 4) Communications: OSU requires Basic Public Speaking, so if you have credit for COM 181, that will fulfill this requirement. However, UK no longer teaches COM 181. OSU will accept COM 287, GEN 100 and courses listed as Graduation Composition and Communications Requirement (GCCR).*
- 5) Science electives (35 credit hours): see OSU website for examples.
- 6) Humanities/Social Science electives (16 credit hours): see OSU website for examples.

*OSU specifically declined the following UK courses for their Communications requirement: COM 252, 281, 311, 314 and 315.

Appendix BB

General Biology Course Equivalency by School

APPENDIX BB - General Biology Course Equivalency by School (as of 8/10/17)

Vet School	Required Pre-req.	Approved UK course(s)
Auburn	Intro biology I and II with labs	BIO 148, 152 + labs; see PV advisor for approved courses
UGA	8hrs general biology w/lab	BIO 148, BIO 155, BIO 208 AND BIO 209 –email 1/17/17
University of Tennessee	8hrs general biology/zoology w/lab	BIO 148, BIO 155, BIO 152 AND one of the following ASC 325, BIO 350, OR BIO 308 –email 4/26/16
NC State	4 hrs Biology w/lab	BIO 148 AND 155
Louisiana State University	8 hrs General Biology w/lab	BIO 148/152/155 + one of the following courses BIO 304, BIO 208/209, BIO 308/309, BIO 315 – Email 2/21/17
LMU	8 hrs General Biology w/lab	BIO 148/152/155 -2/13/17 email
Mississippi State University	8hrs Biological Science w/lab	BIO 148/152/155/315 – 7/28/17- email
Ohio State University	No specific general biology	N/A
Tuskegee	No specific general biology	N/A
UC Davis	2 semesters general biology w/lab	
Colorado State University	No specific general biology	No problem with our biology – email 2/22/17 (student)
Cornell	2 semesters general biology w/lab	Full year of higher-level biology courses with wet lab fulfills –email 2/24/17 (student)
University of Florida	2 semesters of biology w/lab	
University of Illinois	8hrs of biological sciences w/lab	Not specific to lower level biology. Prereq should be fulfilled by any BIO w/lab combination that =8 hrs

Vet School	Required Pre-req.	Approved UK course(s)
Iowa State University	One year series w/lab	If a two-semester series is not available, an organismal biology course with lab and a cellular biology course with lab will substitute. A Bachelor's degree in Biology also fulfills this requirement.
Kansas State University	4hrs Principles of Biology/Zoology	BIO 148 AND BIO 155 ??
Michigan State University	Intro to Biology I and II w/lab	BIO 148/155/152 –email 2/13/17
Midwestern	8 hrs Biology	Not specific to lower level biology. Pre-req should be fulfilled by any BIO w/lab combination that =8 hrs
University of Minnesota	3-5hrs Biology 3-5hrs Zoology	BIO 148 AND BIO 155 BIO 152, BIO 315?, ASC325? OR BIO350?
University of Missouri	No specific general biology needed	
Oklahoma State University	8hrs general zoology or equivalent w/lab	
Oregon State University	2 semester course sequence in general biology	
University of Pennsylvania	9hrs (3 courses) at least one which must cover basics of genetics	
Tufts	2 semester sequence general biology w/lab	
Purdue	2 semesters general biology with lab	
Texas A&M	4hrs General Biology w/lab	BIO 148 AND BIO 155?

Vet School	Required Pre-req.	Approved UK course(s)
Virginia – Maryland	8hrs General Biology	A two-semester sequence with laboratories is required. One course in botany may be used to satisfy the requirements for general biology. However, higher-level science courses may be considered by the admissions committee to fulfill this requirement.
Washington State	8hrs Biology two semester sequence w/lab	Specific to lower level subjects, would need to approve bio courses
Western University	No specific general biology needed	
University of Wisconsin	1 semester intro animal biology w/lab	BIO 148/155 ? or ASC 101?

August 2017

Appendix CC

Graduate Student Handbook

Updated: December, 2016



Graduate Student Handbook

The information in this handbook is intended to assist *prospective and current* graduate students in the Department of Animal and Food Sciences at the University of Kentucky in the pursuit of their graduate programs and during the application process. It should be used as a supplement to the materials published in The Graduate School Bulletin and is subject to change in accordance with changes in policies of The Graduate School, Gillis Building, University of Kentucky, <http://www.research.uky.edu/gs/>

Graduate study is generally an individualized process, so this handbook does not contain a rigid set of guidelines that apply to all students in all situations. Never-the-less, students are responsible for meeting all university program requirements. Graduate students are expected to consult with their mentors, graduate committee and the Director of Graduate Studies on issues for which guidelines are not explicit.

General Information

The degrees of Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) are available in both Animal Science and Food Science. Programs (M.S. and Ph.D.) in Animal and Food Sciences are divided into disciplinary areas of animal nutrition, nutritional physiology, physiology of reproduction and lactation and dairy management. Special interests in beef cattle, dairy cattle, swine, poultry, sheep, and horses may be pursued within many of these disciplines. A Ph.D. program is also offered in wildlife biology through cooperation with faculty members in the Department of Forestry. Programs in Food Science offer specialization in dairy technology, food chemistry, food microbiology, food safety, meat biochemistry and meat processing.

Students interested in Graduate Study in the Department of Animal and Food Sciences are encouraged to consult the list of Graduate Faculty to identify faculty members with research in their areas of interest. There are approximately 25 faculty members in the Department of Animal and Food Sciences who serve as major advisors for graduate students. **Students are admitted to the graduate program in the Department of Animal and Food Sciences only after being selected by an individual faculty member who chooses their students to mentor. Students are rarely admitted without first contacting or being contacted by a faculty member.** There are approximately 50-60 regularly enrolled graduate students in the Department at any one time. Most major advisors mentor 2 or 3 graduate students at a time, but some will have 5 or 6 graduate students in their program. The Graduate Student body is very diverse, and includes men and women from across the U.S. and a number of foreign countries.

Graduates of the M.S. and Ph.D. programs in Animal and Food Sciences find employment in many areas. Students completing the Ph.D. degree are employed by businesses in animal agriculture and food science as well as by universities. Many graduates pursue careers that involve research or teaching at a university. Because of their strong research training, Ph.D. graduates often work with the Cooperative Extension Service or other organizations to assist in transfer of technology and application of research results to the animal and food industries. Many recent M.S. graduates are employed by agribusiness companies in technical service, product development or research roles. A number of M.S. graduates are currently teaching at 2 and 4 year colleges and others are employed as research assistants at universities. Finally, a significant number of M.S. graduates work with youth and 4-H, and adults through the Cooperative Extension Service. Approximately 50% of the students receiving M.S. degrees go on for additional education.

The Director of Graduate Studies

Within each department at the University of Kentucky, there is a faculty member that serves as the Director of Graduate Studies (DGS). The DGS provides information to prospective students, coordinates the application process, and works with the graduate school to make sure that current students and faculty are aware of all new rules or requirements. The DGS chairs the Graduate Activities Committee which meets several times a year to review graduate policies in the Department of Animal and Food Sciences and review fellowship candidates. The DGS does not “accept” graduate students. **The DGS acts on requests by faculty for students they have “chosen” to work with them. It is imperative that students seeking admission work through faculty in their area of interest.**

All prospective graduate students are encouraged to contact the DGS directly during the application process and to schedule a personal visit if possible. The DGS can help prospective students identify potential advisors. **All current students must provide the DGS with contact information (email, phone, office number and local address) to facilitate the flow of information related to deadlines and requirements.** Please see Ms. Robin Notton (7-7508) on the 9th floor of WP Garrigus to fill out an information form. Graduate students must work with the DGS to schedule qualifying exams (Ph.D. candidates) and final exams (M.S. and Ph.D. candidates). The Director of Graduate Studies for the Department of Animal and Food Sciences is: Dr. David L. Harmon, 814 WP Garrigus, University of Kentucky, Lexington KY 40546, 859-257-7516; email: anscidgs@uky.edu

Admission Information

The University of Kentucky is committed to a policy of providing educational opportunities to all qualified students regardless of economic or social status, and will not discriminate on the basis of race, color, religion, sex, marital status, age, national origin or physical or mental disability. Students should indicate whether they are domestic (US) or international students in order to receive the correct application forms.

To be considered for admission to the graduate program in the Department of Animal and Food Sciences, students must:

- Be in the process of completing, or have already completed, a 4-year degree (B.S., B.A. or equivalent) from an accredited institution of higher learning.
- Applicants for a Ph.D. program must be in the process of completing, or have already completed, an M.S. degree or equivalent.
- Have a minimum grade point average of 3.00/4.00 (where an “A” =4) in undergraduate course work and 3.0/4.0 in any graduate course work.
- International applicants must complete the TOEFL (if required; paper 550, Internet, 79; 213 computer based; IELTS 6.5)
- Must take GRE general examination — no score minimum
- Applicants must have completed these courses;
 - Required courses: 1 semester calculus or physics, 3 semesters biology/physiology, 3 semesters chemistry (including 1 semester of organic chemistry or biochemistry).
- Additional courses in physiology, cell biology, microbiology, and anatomy are encouraged
- Applicants must complete all the application forms required by the Graduate School and the Department of Animal and Food Sciences

Graduate School On-Line Application

- ✓ Completed on-line Graduate School application form
- ✓ Payment of application fee
- ✓ Transcripts are uploaded during the application process
- ✓ GRE scores are uploaded
- ✓ TOEFEL scores are uploaded (international only)

Online application is available through the grad school website:

<http://www.research.uky.edu/gs/ProspectiveStudents/Admission.html>

**The Graduate School
University of Kentucky
Gillis Building
Lexington, KY 40506-0027**

Official GRE scores - These scores should be sent directly from Educational Testing Service (ETS). The Institution Code for UK Graduate School is R1837.

Official TOEFL or IELTS scores - All applicants whose native language is not English are required to submit one of these scores directly from the testing service. The minimum acceptable TOEFL score is 550 (paper-based) 213 (computer-based) or 79 (internet-based). The minimum IELTS score is 6.5. Submitted scores must be no more than two years old.

Students must submit all application materials including transcripts, letters of reference, application forms and GRE scores before an admission decision will be made. Students should carefully follow all instructions on the application materials provided. Submission of complete application materials is the responsibility of the student and students should carefully read all materials to determine what should be submitted to the Graduate School and what should be submitted directly to the Department of Animal and Food Sciences. To maximize chances for admission in the Fall semester with funding, students should complete the application process for the Department of Animal and Food Sciences by January 15. For Spring admission all materials should be submitted by September 15.

Graduate School Application Deadlines are:

Domestic students: All materials received one month prior to semester you wish to enroll.

International students: **Fall Semester Deadline: March 15**
 Spring Semester Deadline: August 15

Admission to the M.S. and Ph.D. degree programs in the Animal Science and Food Science areas is selective and competitive. Most students entering Graduate Programs in the Department of Animal and Food Sciences have academic credentials far above the minimum requirements. Selection criteria vary by discipline area with any or all of the following being important: grade point average, GRE score, references, strength of previous academic program (course work), evidence of research experience, etc. Some faculty may require students to come for an interview, or they may conduct a phone interview. All prospective students are encouraged to visit the University of Kentucky. During a visit, prospective students can meet with potential advisors, the Director of Graduate Studies and current students. Prospective students should contact the Department of Animal and Food Sciences at least 2 weeks prior to their anticipated visit to make arrangements with specific faculty members and the Director of Graduate Studies.

Graduate students in the Department of Animal and Food Sciences come from a variety of undergraduate programs, including Animal Science, Food Science, Biology, and General Agriculture. Typically, successful applicants have completed a strong science-based program. Occasionally, students with strong academic records are not admitted to the Graduate Program in the Department of Animal and Food Sciences because all graduate student positions are already filled. The graduate school automatically sends rejection letters to all non-admitted applicants at the end of each semester. However, the Graduate School and the department both maintain your application and you may be considered for admission in subsequent semesters. It is best if you contact the Graduate School and the department to request that your application be considered for the following semester (or whatever semester you wish to be considered).

Under unusual circumstances, a student that does not meet the minimum admission requirements may be admitted on a provisional basis. Students that do not meet minimum admission requirements should consult with the Director of Graduate Studies for the Department of Animal and Food Sciences or a faculty member in their area of interest as to the best course of action.

Because most programs are somewhat individualized, neither the M.S. nor the Ph.D. programs have specific beginning or ending dates. Most students begin graduate programs at the start of the Fall semester, but students occasionally begin their programs in the Spring semester (January to May) or Summer (May to August). The expected period for completion of an M.S. degree is about 2-2.5 years (including summer session). The expected period for completion of a Ph.D. degree is 3-4 years (including summer session). Although graduate programs do not begin or end on a specific schedule, the time frame is not open ended. The Graduate School Bulletin describes the specific time limits for each degree.

Departmental Philosophy and Expectations Concerning Graduate Education in Animal and Food Sciences

Graduate programs are very different from undergraduate programs in the Department of Animal and Food Sciences. Undergraduate programs rely primarily on completion of a group of required and elective courses in a certain area. Graduate programs include course work requirements, but course work is only one facet of a graduate program. The primary focus of a graduate program in the Department of Animal and Food Sciences is the generation of novel and publishable research results. The level of self-motivation, dedication and responsibility required for success in a graduate program is much greater than what is required in an undergraduate program. Graduate study in the Department of Animal and Food Sciences requires a large individual commitment but offers an outstanding opportunity for personal and professional development. Every experience is different but graduate students frequently report that their graduate program has enhanced their confidence and ability to work independently, improved their time management and organizational skills, and increased their subject matter expertise.

The research component of a graduate program emphasizes skills in critical thinking, experimental design and scientific writing. Although it is common for students to assist with a variety of research studies during the course of their program, every student must conduct their own project(s), then write and defend a comprehensive thesis describing that research. Graduate students work closely with their graduate advisor to design and implement an appropriate research project, then organize and publish the results. Most students will present their research at regional or national meetings in their area of expertise. The goal of the Graduate Program in the Department of Animal and Food Sciences is to develop animal and food science specialists who are able to succeed in a variety of sophisticated academic, industrial and professional settings. Thus, as part of their professional development, graduate students are encouraged to participate in all missions of the Department of Animal and Food Sciences, including teaching and extension. All students pursuing a Ph.D. are encouraged by the Department of Animal and Food Sciences to participate in a meaningful teaching or extension activity. Throughout their graduate career, students are encouraged to interact with other students and faculty within and outside of their area of interest.

Graduate students are expected to take an active role in the implementation of their research projects. The Department of Animal and Food Sciences has extensive research facilities on campus and at the research farms with an excellent technical support staff. However, graduate students are commonly responsible for sample collection, sample analysis, assay development (especially Ph.D. candidates), maintenance of cell cultures or microbial cultures and daily care of their research animals. Animal research is frequently time-sensitive; that is, certain measurements can only be made when animals are in a particular physiological state (at calving or foaling, during estrus, during lactation, at weaning, etc.) and these physiological states commonly occur at the convenience of the animal, not the researcher. Furthermore, animals require daily care, at a minimum, and constant monitoring during some types of experiments. Consequently, research projects in all disciplines require work on weekends, nights and holidays.

A graduate program in Animal and Food Sciences is a full-time commitment. Most students will spend about a third of their time in class or studying, and the remainder in research-related activities. During intensive research studies, it is not uncommon for graduate students to work more than 60 h/wk. Although graduate students assist with some teaching and extension activities, the time commitment is variable (usually less than 5 h/week). Students should expect the distribution of their time to change during the course of their graduate program. Particularly in Ph.D. programs, course work is concentrated in the first few semesters so the student can devote more time to research and writing of their dissertation towards the end of their program.

The Department of Animal and Food Sciences at the University of Kentucky is dedicated to ensuring that

every student makes choices that are best suited to his/her educational and professional development. The decision to pursue a graduate degree should be made only after deliberate consideration of every aspect of the program. Before applying to a graduate program in the Department of Animal and Food Sciences, we encourage every student to ask themselves three important questions:

“Am I committed to Animal or Food Science as a career choice?”

“Am I willing to make the personal commitment in time and effort that will be needed to successfully complete a graduate program?”

“Is a graduate program at the University of Kentucky the best one for me?”

Types of Financial Support

A graduate program is a full-time commitment and most graduate students in the Department of Animal and Food Sciences receive some type of financial support. The University of Kentucky offers a small number of fellowships through the Graduate School. A fellowship is a non-service award made to superior students to assist in the pursuit of an advanced degree. Some fellowships are very restricted in terms of eligibility and all are very competitive. In order to be considered for most Fall Semester Fellowship opportunities, all admission materials (application, transcripts, references, GRE scores) must be received by the Department of Animal and Food Sciences by January 15.

Unlike many departments at the University of Kentucky, the Department of Animal and Food Sciences offers few Teaching Assistantships for graduate students. Instead, graduate students may be eligible for Research Assistantships. The Graduate School defines an assistantship as an appointment to specified teaching or research duties. A Research Assistantship offers a modest stipend that is intended to assist the student in meeting financial obligations during the graduate program. An assistantship is not a scholarship and students are expected to participate in the missions of the Department in exchange for this funding. In general, students receiving a half-time assistantship should expect to devote at least 20 hours a week to activities associated with research, extension or teaching, which may or may not be related to their thesis or dissertation. These activities may include (but are not limited to): general laboratory work, animal care, data collection, statistical analysis, library research not associated with course-work, assisting with classes or laboratories, grading exams or quizzes, and helping with 4-H or Extension activities. Typically, students will find that their activities will vary from week to week. Students that receive financial support from the Department of Animal and Food Sciences must complete payroll forms. These forms are available through the Office of the Chair of the Department of Animal and Food Sciences (Room 908).

Graduate students must be in good academic standing (GPA 3.0) and maintain 9-12 hours per semester in order to receive an assistantship. Some assistantships may be associated with a specific activity or project and thus may be available for a limited period. Continuation of support is always contingent on academic performance as stated in the Graduate Student Academic Staff Notice of Appointment (GSAS) student contract, and acceptable programmatic progress in regard to research and other responsibilities associated with completion of a student's degree.

All graduate research assistants receive paid tuition.

A couple of points:

- Any semester your cumulative (at least 9 hours) GPA falls below 3.0, you become responsible for tuition until it increases to 3.0
- If you are a non-resident you must pay non-resident tuition
- Students are responsible for tuition if they need to enroll in the summer
- Graduate School will no longer pay charges for withdrawal or drop below full time for funded students

Students can be accepted into the graduate program with or without financial support. The amount and source of financial support varies from program to program. Some financial support may be tied to a specific research project and the amount of support will be determined within that project. Typically, graduate students admitted with support will receive a letter from their major professor detailing the amount of funding they will receive.

Some students may be accepted into the Graduate Program in the Department of Animal and Food Sciences without a promise of financial support. Students accepted without financial support are considered to be “self-supporting”. Students that do not receive support from the Graduate School or the Department of Animal and Food Sciences are not relieved of responsibility in regard to research, teaching or Extension activities. These activities are considered an essential component of graduate education regardless of an individual’s financial situation.

Tuition and Fees

Kentucky residents (those not receiving a fellowship or assistantship) currently pay \$6,118/semester in tuition and fees. Non-Kentucky residents (US and international) pay approximately \$14,190/semester. **All** full-time graduate students are charged (and are responsible for paying) student fees (a mandatory health and recreation fee of approximately \$655 per semester). These fees entitle the student to use the Student Health Service and some of the athletic and recreational facilities at the University of Kentucky. The student health fee is separate from Student Health Insurance.

All graduate research assistants, fellowship recipients and teaching assistants are provided with health insurance at no cost to the student (see: <https://uky.myahpcare.com>). Non-funded graduate students may be eligible to purchase health insurance. International students that are funded through assistantships or fellowships will receive health insurance at no cost (as described above). Non-funded international students will be charged for health insurance. The charge will appear as part of fees due for the semester.

Degree Requirements:

Master of Science (M.S.)

The Master of Science (M.S.) degree in Animal and Food Sciences requires:

- at least 24 credit hours of course work with at least 2/3 of the course work in regular classes (not special project, independent study, etc.) and at least 12 hours must be at the 600 or 700 level (excluding thesis credit)
- a minimum 3.0 grade point average for all course work
- Successful completion of ASC 771 (Animal Science Seminar)
- Successful completion of a final exam*
- Submission of an approved thesis** to the Graduate School

* The final exam includes presentation of the thesis research and is scheduled after the thesis is complete. At least one month prior to the expected exam date, the student should consult with the Director of Graduate Studies regarding procedures for scheduling the exam through the Graduate School. All requests for exams must be completed at least 2 weeks before the exam date. In most cases, the complete thesis must be provided to the committee at least 2 weeks prior to the final exam. Exams may not be scheduled within the 8-day period preceding the end of a semester or during periods when classes are not in session. The final exam follows an oral presentation of the thesis research and is conducted by a committee of at least three faculty members. Typically the student’s advisor chairs the committee. Students should consult with their advisor regarding the selection of committee members and scheduling of the exam.

Students must file an **Application for Degree** (on-line through graduate school website) in the Graduate School within 30 days after start of semester (15 days into 8-week summer semester) in which the student wishes to graduate. These are good for one year.

** Under unusual circumstances the Department of Animal and Food Sciences may agree to waive the requirement for a thesis by substituting additional course work or other requirements.

Doctor of Philosophy (Ph.D.)

According to the Graduate School, the Ph.D. degree represents “documentation of independent and comprehensive scholarship in a specific field. Such scholarship must be manifested by both the student’s mastery of subject matter and capacity to do research.” Therefore, the requirements and expectations for completion of a Ph.D. are greater than those associated with an M.S. degree.

The Ph.D. degree in Animal and Food Sciences requires:

- Doctoral students no longer have to follow Models I, II or III to meet the prequalifying residency requirement.
- Students must simply complete the requirement of 36 credit hours of graduate coursework* within five years of entry into the doctoral program.
- An awarded master’s degree from the University of Kentucky or from another accredited school may satisfy 18 of this 36 hour pre-qualifying requirement.

All Ph.D. students are required to enroll in a 2 credit hour course after successfully completing the qualifying examination, ASC 767, Dissertation Residency Credit. They will be charged at the in-state tuition rate plus mandatory fees. **Students will remain continuously enrolled** in this course every fall and spring semester until they have completed and defended the dissertation. This will constitute full-time enrollment. Students are required to complete two semesters of 767 before they can graduate.

Requirements for Ph.D.

- Successful completion of ASC 771 (Animal Science Seminar)
- A minimum 3.0 grade point average on all course work
- Successful completion of the Qualifying Exam**
- Successful completion and defense of the Ph.D. dissertation***
- Submission of the approved dissertation to the Graduate School and payment of dissertation fees

* During the student’s first or second semester, they should consult with their advisor concerning the selection of an Advisory Committee (minimum of 4 members: advisor is chair and one member must be outside the department). The Advisory Committee serves to assist the student in selection of courses, design of experiments, development of techniques and preparation of the dissertation. The Advisory Committee also administers the Qualifying Exam and the Final Exam.

**The Qualifying Exam determines that the student has sufficient mastery of the subject matter in their field. The Qualifying Exam is usually scheduled after the second year of a student’s program. The Qualifying Exam must be scheduled through the Director of Graduate Studies. The Graduate School must approve the exam at least 2 weeks prior to the beginning of the exam. The format of the Qualifying Exam is determined by the Advisory Committee and may have written and oral components.

***The Final Exam includes defense of the dissertation and any other components determined to be appropriate by the Advisory Committee. The final exam must be scheduled according to the following process: At least 30 days prior to the proposed date for the exam, the student will distribute the dissertation to the Advisory Committee. At that time, the student’s advisor will inform the Director of Graduate Studies that the dissertation has been distributed and the Director of Graduate Studies will advise the Graduate School of the intent to examine the student. *For all doctoral Final Examinations the lead-time for submitting the "Notification of Intent to Schedule a Final Doctoral Examination" form has been changed to a minimum of 8 weeks prior to the anticipated date of your defense.* The Dean of the Graduate School will then appoint an outside examiner to the Advisory Committee and the student may proceed to schedule the exam. The exact time, date and location of the exam must be scheduled at least 2 weeks prior to the exam.

The Dissertation Approval Form, along with an acceptable copy of the dissertation must be presented to the graduate school at the time the exam is scheduled. It is intended that the Advisory Committee should have the opportunity to make suggestions to the dissertation in the period between its distribution and the scheduling of the exam. The final exam must take place during a regular semester/summer session and may not be scheduled in the last 8 days before the end of a semester/session. The final exam is a public event. Students should note that there is a compulsory minimum period between when the Qualifying Exam is passed and when the Final Exam may be scheduled (see Residency Requirements on previous page).

Graduate Courses and Course Loads

The only course required of all students is ASC 771 (Animal and Food Sciences Seminar). All students are required to take other classes, but the selection of the courses and the order in which they are completed will vary with the student's program. For M.S. students, classes are selected in consultation with the student's advisor. For Ph.D. students, classes are selected in consultation with the advisor and the Advisory Committee. A full course load for a graduate student is considered to be 9 credit hours per semester (fall or spring). **However, unless you are required to be enrolled full time, e.g. to meet visa requirements or for student loans, you can take less than 9 hours and students are encouraged to do this whenever possible.** The Department of Animal and Food Sciences offers a variety of graduate level courses. Graduate students in Animal and Food Sciences and Food Science also take courses offered by many other departments including (but not limited to): Agronomy, Biochemistry, Statistics, Clinical Nutrition, and Biology. Graduate students may receive graduate credit for Animal Science (ASC) or Food Science (FSC) courses listed at the 500, 600 or 700 level. They may also receive graduate credit for some 400-level courses offered by other departments. Graduate students only receive credit for courses completed with a grade of "C" or better. Students that do not maintain a 3.0 grade point average are subject to academic probation and dismissal.

University and Departmental Resources Available to Graduate Students

The Department of Animal and Food Sciences maintains a wide variety of Research Facilities. These facilities are also used for teaching activities. The Beef, Sheep and Swine Research Units are located at the Animal Research Center in Woodford County. The Poultry and Dairy units are located in Fayette County on Coldstream Farm. The Horse Unit is on Maine Chance Farm in Fayette County. All of these animal units are within 30 min. driving distance from campus. The Garrigus Building houses all of the laboratory facilities for the Department of Animal and Food Sciences as well as a Meat Processing Facility and several animal research rooms. Additional facilities are located at the Princeton station.

The University of Kentucky has excellent library and literature searching capabilities for students and faculty. Most students use resources located in the W. T. Young Library, the Agricultural Learning Center or the College of Medicine Library, which are all located within easy walking distance from the Department of Animal and Food Sciences.

Within the Department of Animal and Food Sciences, graduate students are expected to share offices, but each graduate student will have their own desk. Graduate students will be issued keys for their office and the Garrigus Building. They may also be issued keys to other areas (laboratories, animal units) as necessary.

The Department of Animal and Food Sciences has a number of computers available for graduate student use, but many students prefer to use their own. In addition, the Agricultural Learning Center has laptop computers available for loan for brief periods. Graduate students have access to a telephone for work-related use. These phones should not be used for long distance calls. Every student should discuss with their advisor the appropriate use of clerical services and equipment in the department, including fax and copy machines. These machines should be used only for Departmental activities. Fax and copy machines are not available for personal use. Personal use includes copying notes or other materials for courses a student is taking, duplicating a thesis, copying papers to be used in course work, copying term papers, etc. Preparation of theses and dissertations are at the student's expense. This includes all copying and printing costs.

Many graduate students travel to regional and national scientific meetings in conjunction with their graduate program. When students are giving presentations at scientific meetings, support for travel may be available through the Graduate School or through the Department of Animal and Food Sciences. Graduate students should work closely with their advisor in making travel plans related to their graduate program. The University of Kentucky requires that all out of state and international travel be approved in advance. In addition, there are some restrictions on graduate student drivers of University-owned vehicles under certain conditions.

Animal and Food Sciences Graduate Association

All graduate students are encouraged to join the Animal and Food Sciences Graduate Association. The purpose of the association is 1) to provide opportunities for graduate students to meet, interact, and learn about research within the department, 2) to provide opportunities for professional development, 3) to organize social gatherings for graduate interaction and discussion, and 4) to help new graduate students discover opportunities at the University of Kentucky. To join or for more information, contact the faculty advisor: Dr. Kristine Urschel, 612 WP Garrigus, Lexington KY 40546, 859-257-7748, klurschel@uky.edu.

Travel: If you travel to a meeting to present a paper, the Graduate School will provide \$400 per year in travel support. This must be applied for in advance and is the responsibility of the student. Applications are due the 15th of each month prior to the month of travel (or the next business day if the office is closed):

For information see:

<http://www.research.uky.edu/gs/StudentFunding/supportfunding.html>

Other costs associated with meeting or other official travel are at the discretion of your major professor and are not the responsibility of the department. However, any official travel requires:

- Submission of Travel Request prior to travel
- Receipts for all expenses with the exception of meals
- Submission of Travel Voucher upon completion of travel

Guidelines for Academic Progress in Animal & Food Sciences Graduate Programs

Prior to July 1 of each year all students will provide a progress report to the DGS. The progress report will consist of a list of milestones achieved, advisor evaluation, and narrative statements. The progress report must be reviewed and signed by the research advisor and student. Failure to turn in the progress report has consequences for departmental support and graduate school funding in that a contract for the new fiscal year will not be submitted until completed.

M.S.

1. Student has made good academic progress. At the end of the first year student has completed two semesters with appropriate course load and achieved a ≥ 3.0 GPA.
2. Formed supervisory committee.
3. Outlined program of study.

Ph.D.

First-year

1. Student has made good academic progress. At the end of the first year student has completed two semesters with appropriate course load and achieved a ≥ 3.0 GPA.
2. Formed supervisory committee.
3. Outlined program of study.

Second-year

1. Student has continued good academic progress. At the end of the second year student has completed course work requirements and achieved a ≥ 3.0 GPA.
2. Met with supervisory committee and presented research proposal.
3. Scheduled qualifying examination.

Third-year

1. Passed qualifying examination.
2. Actively engaged in research
3. Met with supervisory committee

Fourth-year

1. Met with supervisory committee
2. Scheduled final examination

Name: _____

Date of review: _____

Degree: PhD MS (thesis) MS (Plan B - non-thesis)

Research area/thesis /dissertation title: _____

Major advisor: _____

Date of start of program: _____

Date of most recent committee meeting: _____

Summary of progress in course work:

Summary of progress in research:

Recommendations:

GPA: Last semester _____ Cumulative _____

Attach Current CV

Signatures

STUDENT _____

MAJOR ADVISOR _____

DGS: _____

Animal and Food Sciences Student Checklist (Masters)

- Enroll in the semester for which you were accepted.
 - Must be enrolled **EVERY** Fall and Spring semester until completed
- Establish a course curriculum with your advisor.
- Outline and conduct research.
 - **Notify DGS** when you qualify for “ASC 748 zero hours” (after course requirements are complete) to save tuition
- Determine an examining committee.
- Complete your thesis.
- The semester you intend to graduate do the following:

Application for degree: _____ (Date Submitted)

<http://myuk.uky.edu/> Click on: Student Services / myRecords / Graduate Degree Application Due 30 days after the beginning of the semester (15 days for 2nd summer session). Please see <http://www.uky.edu/Registrar/AcademicCalendar.htm> for specific deadlines.

At least 2 weeks prior to examination, submit this form:

Request for Final Master’s Examination: _____ (Date Submitted)

http://www.research.uky.edu/cfdocs/gs/MastersCommittee/Student/Selection_Screen.cfm

(The Thesis Approval form is incorporated into the above online form)

Conduct a review of your transcript to insure you don’t have any missing grades; I grades and your GPA is 3.00 or higher. Graduate School policy will not allow you to sit for the exam if you have unresolved academic issues.

The final examination must take place no later than eight days prior to the last day of classes of the semester in which the student expects to graduate. Final examinations may not be scheduled during the period between semesters or between the end of the eight-week summer session and the beginning of the fall semester. Consult the Academic Calendar (<http://www.uky.edu/Registrar/AcademicCalendar.htm>) for deadlines for the scheduling of final examinations.

Thesis:

You have 60 days following the date of your defense to submit your final, accepted document to the Graduate School. You will not have the entire 60 days if you defend late in the semester and need to graduate that semester (check <http://www.uky.edu/Registrar/AcademicCalendar.htm> for submission deadlines). Prior to final submission you must have your thesis reviewed by the Graduate School for a first format check. This process takes about 48 hours but may take longer during peak periods, especially during the end of the semester. Please plan accordingly.

Animal Sciences Student Checklist (PhD)

- Enroll in the semester for which you were accepted.
 - Must be enrolled **EVERY** Fall and Spring semester until you complete your degree (continuous 2 hours of ASC 767 after qualifying exam)
- During your first year as Ph.D. student:
 - **Formation of advisory committee** _____ (Date Submitted)
 - http://www.research.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm
 - The advisory committee has a core of four members. This core consists of the major professor as chair, two other members from the major area, and at least one representative from any minor area(s). At least one representative must be from outside the academic program (department). All members of the core must be members of the Graduate Faculty of the University of Kentucky and three (including the major professor) must possess full Graduate Faculty status.
- At least two weeks prior to qualifying exam date:
 - **Qualifying Examination Request** _____ (Date Submitted)
 - http://www.research.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm
 - Students must have the equivalent of 2 years of residency (36 hours)
 - Conduct a review of your transcript to insure you don't have any missing grades; I grades and your GPA is 3.00 or higher. Graduate School policy will not allow you to sit if you have unresolved academic issues.
 - After passing the qualifying exam, students must maintain continuous enrollment (**2 hours of ASC 767**) until dissertation is successfully defended.
- The semester you intend to graduate:
 - **Application for degree:** _____ (Date Submitted)
 - [http://myuk.uky.edu/ Click on Student Services/myRecords/Graduate Degree Application](http://myuk.uky.edu/Click%20on%20Student%20Services/myRecords/Graduate%20Degree%20Application)
 - Due 30 days after the beginning of the semester (15 days for 2nd summer session). Please see <http://www.uky.edu/Registrar/AcademicCalendar.htm> for specific deadlines. You must resubmit the application for degree the following semester if you do not graduate.
- At least eight weeks prior to expected final exam date:
 - **Notification of Intent:** _____ (Date Submitted)
 - http://www.research.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm
 - Once submitted, the graduate school will appoint an outside examiner. There must be a two week window given in order to find an appropriate outside examiner. Assigning the outside examiner typically takes 4-5 weeks and you will receive an email when an outside examiner has been found.
- At least 2 weeks prior to examination:
 - **Request for Final Doctoral Examination:** _____ (Date Submitted)
 - http://www.research.uky.edu/cfdocs/gs/DoctoralCommittee/Selection_Screen.cfm
 - **Dissertation Approval form (no longer required by the Graduate School)**
- Dissertation:** You have 60 days following the date of your defense to submit your final, accepted document to the Graduate School. You will not have the entire 60 days if you defend late in the semester and need to graduate that semester (check <http://www.uky.edu/Registrar/AcademicCalendar.htm> for submission deadlines). Prior to final submission you must have your dissertation reviewed by the Graduate School for a first format check. This process takes about 48 hours but may take longer during peak periods, especially during the end of the semester. Please plan accordingly.



FREQUENTLY ASKED QUESTIONS ABOUT GRADUATE STUDY:

What programs are offered?

Both the M.S. and Ph.D. degrees in Animal Science are offered. To be eligible for admission to a Ph.D. program, a student must already have a M.S. degree or equivalent. Students may concentrate in the areas of animal nutrition, reproductive physiology, microbiology, food science, digestive physiology and animal management. The Department of Animal Science maintains horses, sheep, poultry, beef cattle, dairy cattle, dogs and swine for research purposes.

How do I apply?

Students interested in applying to the Graduate Program in the Department of Animal and Food Sciences may contact Dr. David L. Harmon, Director of Graduate Studies, Department of Animal and Food Sciences, 814 WP Garrigus, University of Kentucky, Lexington KY 40546, 859-257-7516 (or 257-7508); email: anscidgs@uky.edu for application information.

Students should identify their primary areas of interest when they apply. In the Department of Animal and Food Sciences, students are accepted by specific faculty members who serve as the student's advisor throughout their program. To find out which faculty advise students in your area of interest, consult the list of Faculty Interests via

<http://www.uky.edu/Aq/AnimalSciences/faculty/facultydirectory.html>

What careers are available after graduation?

Graduates of the M.S. and Ph.D. programs in Animal and Food Sciences find employment in many areas. Many graduates pursue careers that involve research or teaching at a college or university. Some graduates work with the Cooperative Extension Service or other organizations to assist in transfer of technology and application of research results to the animal and food industries. Graduates are also employed by agribusiness companies in technical service, product development or research roles. Approximately 50% of the students receiving M.S. degrees go on for additional education.

How much does it cost?

All graduate research assistants and fellowship recipients receive paid tuition. Kentucky residents not receiving financial support currently pay about \$6,118/semester in tuition and approximately \$655 in fees. Non-Kentucky residents (US and international) pay approximately \$14,190/semester in tuition and the same fees.

Is it difficult to get into graduate school?

Admission to the M.S. and Ph.D. degree programs in the Animal Science and Food Science areas is selective and competitive. Most students entering Graduate Programs in the Department of Animal and Food Sciences have academic credentials far above the minimum requirements. The median undergraduate GPA of domestic students enrolled in the Department of Animal and Food Sciences is currently 3.1; median GRE percentiles for the verbal and quantitative segments of the exam for currently enrolled domestic students are 46% and 56%, respectively. **Your opportunity is greatly enhanced by contacting faculty in your area of interest!**

If I don't get into Veterinary School, what is the deadline for applying to graduate school?

The official admission deadline to be considered for fall semester is in July. However, most admission decisions are made much earlier than that. To maximize chances for admission in the Fall semester, students should complete the application process for the Department of Animal and Food Sciences by January 15. The Department of Animal and Food Sciences has a limited number of openings for new students each year. Consequently, students applying after January 15 may not be admitted to the Graduate Program in the Department of Animal and Food Sciences because all open positions for new graduate students have already been filled.

What courses will I be required to take?

Because each graduate program is somewhat individualized, course selection is made in consultation with your advisor, or in the case of a Ph.D. student, with the Advisory Committee. All students are required to take ASC 771: Animal Science Seminar. Graduate credit is given for classes at the 600 and 700 level in Animal and Food Sciences and for some classes at the 400-level that are offered by other departments. The Department of Animal and Food Sciences offers a wide variety of graduate courses. A full course load for most graduate students is 9 hours with 12 hours being the maximum.

Can I complete my degree by taking a few classes at a time?

Course work is actually a fairly small portion of a graduate program. The primary focus of a graduate program in the Department of Animal and Food Sciences is the generation of novel and publishable research results. Graduate students are expected to take an active role in the design and implementation of their research and to write a thesis describing their studies. Graduate students are also expected to have a high level of interaction with other students and faculty and to participate in all of the missions of the Department of Animal and Food Sciences including teaching and extension activities. In general, graduate study is a full-time commitment.

Is a graduate program in Animal and Food Sciences right for me?

Before applying to a graduate program in the Department of Animal and Food Sciences, we encourage every student to ask themselves three important questions:

- a. "Am I committed to Animal or Food Science as a career choice?"
- b. "Am I willing to make the personal commitment in time and effort that will be needed to successfully complete a graduate program?"
- c. "Is a graduate program at the University of Kentucky the best one for me?"

If you can comfortably answer "Yes!" to these questions, then we encourage you to apply!

Is there any way I can prepare myself for graduate study?

In a recent survey, current graduate students indicated that the best preparation for graduate school included: taking science-based courses, participating in activities that developed self-reliance and time management skills and getting some research experience as an undergraduate.

Appendix DD

The Graduate School
at UK

The Graduate School



Brian Jackson, Ph.D., is Interim Dean of the Graduate School.

The University of Kentucky began offering graduate work in 1870, and awarding degrees in 1876. The Graduate School was organized as a distinct unit in 1912.

The Graduate School is concerned with advanced study and research carried on by the faculty and students of all colleges and departments. Under it, the total graduate resources of the University are merged in order to promote the achievement of knowledge in an atmosphere of free and lively inquiry.

More information is available on the Web at: www.gradschool.uky.edu/

GRADUATE DEGREES

Graduate work is offered in most colleges in the University. The following advanced degrees are conferred:

Doctor of Education
 Doctor of Musical Arts
 Doctor of Philosophy
 Master of Architecture
 Master of Arts
 Master of Arts in Education
 Master of Arts in Teaching World Languages
 Master of Arts in Interior Design
 Master of Business Administration
 Master of Education
 Master of Engineering
 Master of Fine Arts
 Master of Health Administration
 Master of Historic Preservation
 Master of Mining Engineering
 Master of Music
 Master of Public Administration
 Master of Public Financial Management
 Master of Public Health
 Master of Public Policy
 Master of Rehabilitation Counseling
 Master of Science
 Master of Science in Accounting
 Master of Science in Agriculture
 Master of Science in Athletic Training
 Master of Science in Applied Behavior Analysis
 Master of Science in Biomedical Engineering
 Master of Science in Biosystems and Agricultural Engineering
 Master of Science in Chemical Engineering
 Master of Science in Civil Engineering
 Master of Science in Clinical Research Design
 Master of Science in Communication Sciences and Disorders

Master of Science in Community and Leadership Development
 Master of Science in Education
 Master of Science in Electrical Engineering
 Master of Science in Epidemiology
 Master of Science in Family Sciences
 Master of Science in Forestry
 Master of Science in Library Science
 Master of Science in Manufacturing Systems Engineering
 Master of Science in Materials Science and Engineering
 Master of Science in Mechanical Engineering
 Master of Science in Mining Engineering
 Master of Science in Nursing
 Master of Science in Nutrition and Food Systems
 Master of Science in Nutritional Sciences
 Master of Science in Physician Assistant Studies
 Master of Science: Professional Master in Biomedical Engineering
 Master of Science in Radiological Medical Physics
 Master of Science in Retailing and Tourism Management
 Master of Social Work
 Specialist in Education

The degree of **Doctor of Philosophy** is offered with major work in the following fields:

Agricultural Economics
 Anatomy and Neurobiology
 Animal and Food Sciences
 Anthropology
 Biochemistry
 Biology
 Biomedical Engineering
 Biosystems and Agricultural Engineering
 Business Administration
 Chemical Engineering
 Chemistry
 Civil Engineering
 Clinical and Translational Sciences
 Communication
 Computer Science
 Counseling Psychology
 Early Childhood, Special Education, and Rehabilitation Counseling
 Economics
 Educational Psychology
 Education Sciences
 Educational Leadership Studies
 Educational Policy Studies, Measurement and Evaluation
 Electrical Engineering

English
 Entomology
 Epidemiology and Biostatistics
 Exercise Science
 Family Studies
 Gender and Women's Studies
 Geography
 Geological Sciences
 Gerontology
 Hispanic Studies
 History
 Integrated Plant and Soil Science
 Kinesiology and Health Promotion
 Materials Science and Engineering
 Mathematics
 Mechanical Engineering
 Microbiology
 Mining Engineering
 Music
 Musical Arts
 Nursing
 Nutritional Sciences
 Pharmaceutical Sciences
 Pharmacology
 Philosophy
 Physics
 Physiology
 Plant Physiology
 Political Science
 Psychology - Clinical Psychology
 Psychology - Experimental Psychology
 Public Policy and Administration
 Rehabilitation Sciences
 Social Work
 Sociology
 Spanish
 Special Education
 Statistics
 Studies in Higher Education
 Toxicology
 Veterinary Science

The Graduate School administers two multidisciplinary Graduate Centers:

The Patterson School of Diplomacy and International Commerce offers an interdisciplinary master's degree which can be tailored to meet the career needs of individual students. The program is especially useful for students desiring careers in any of the non-academic fields in foreign affairs such as international banking, commerce and journalism, or service with governmental agencies or international organizations. For more information see the Patterson School Web site at: www.uky.edu/PattersonSchool/

The Martin School of Public Policy and Administration offers four multidisciplinary degree programs—the Master of Public Administration, the Master of Public Financial Management, the Master of Public Policy and the Ph.D. in Public Administration—and engages in research and public service activities. The disciplines represented by the School's faculty are management, finance, economics, industrial engineering, political science, and health administration. The research and public service components of the Martin School offer the School's faculty, staff, and graduate students the opportunity to engage in interdisciplinary research on public policy issues. For more information see the Martin School Web site at: www.martin.uky.edu/

ORGANIZATION OF THE GRADUATE SCHOOL

The Graduate Faculty consists of the Dean of the Graduate School and all persons appointed thereto by the President of the University. As the chief University agency for the promotion of the ideals of graduate study, it determines the policies of the Graduate School and makes recommendations to the University Senate on such matters as require the approval of that body. All rules affecting graduate work and the inauguration of new graduate programs must be approved by the Graduate Faculty.

The Dean. The Dean of the Graduate School is charged with the administration of the policies adopted by the Graduate Faculty and the University Senate relating to graduate studies.

The Graduate Council is composed of 21 members and the Dean of the Graduate School, who serves as chair. There are 19 faculty representatives and two student representatives. Associate deans serve in a nonvoting, ex officio capacity.

The Graduate Council approves or disapproves proposals concerning courses offered for graduate credit, and advises and lends assistance to the Dean of the Graduate School in his execution of policies and regulations determined by the Graduate Faculty.

Directors of Graduate Studies. A Director of Graduate Studies is appointed for each program of graduate study. Among other duties, each director serves as advisor to students majoring in his or her area.

ADMISSION

Students seeking admission to a degree program in the Graduate School must hold a baccalaureate degree from a fully accredited institution of higher learning. An overall undergraduate grade-point average of 2.75 and 3.0 on all graduate work is required by the Graduate School. Individual departments may require higher grade-point averages.

All applicants for admission to degree programs in the Graduate School must submit official scores on the verbal, quantitative and analytical writing portions of the Graduate Record Examination, except programs with approved alternate requirements (refer to *The Graduate School Bulletin* for a list of programs).

Upon admission, new students must submit official transcripts directly to the Graduate School from each institution of higher learning previously attended.

International applicants must meet the requirements listed above, as well as the English proficiency requirement (refer to *The Graduate School Bulletin* for a list of programs).

For domestic applicants (U.S. citizens or resident aliens) the application fee is \$65; for international applicants, the fee is \$75.

Complete applications must be submitted no later than one month before the beginning of the term the applicant intends to begin graduate work (five months for international applicants). Students should refer to the *University Calendar* in the front of this Bulletin for important dates.

University Scholars Program (Combined Doctoral or Master's/ Bachelor's Degree Program)

This program offers particularly gifted and highly motivated students the opportunity of integrating their undergraduate and graduate courses of study in a single continuous program culminating in both a baccalaureate and a master's or doctoral degree. The total number of hours for the combined program may be as many as 12 less than the total required for the bachelor's and the master's or doctoral degrees separately. The requirements for the bachelor's degree are unaffected.

Applications to the program should be submitted at the end of the student's junior year. Applicants should have completed at least 90 credit hours of work toward the bachelor's degree, or be eligible for senior standing in the semester they are admitted to the program. The master's program should be in the field of the undergraduate major (there are some exceptions made), and the undergraduate grade-point average must be at least a 3.50 in the applicant's major field and 3.20 overall.

Students must register in the Graduate School for all work taken following admission to the University Scholars Program. The primary classification of University Scholars will be undergraduate until they have completed all requirements for their undergraduate degree, and undergraduate tuition rates will be applied to the 12 hours (or less) of graduate level course work designated for dual credit in this program.

Graduating Seniors as Part-Time Graduate Students

A senior at the University of Kentucky lacking no more than six credit hours for graduation and having an undergraduate grade-point average of at least 2.75 on all work attempted may register in a degree program in the Graduate School with the consent of his or her college dean, the Director of Graduate Studies, and the Dean of the Graduate School.

The total load of such a student may not exceed 12 credit hours. Graduate credit will be allowed for each credit hour of graduate work beyond the six or fewer credit hours needed to complete undergraduate requirements. Requirements for the undergraduate degree must be completed during the semester in which the student is allowed to register for part-time graduate work.

Conditional Admission

Students wishing to pursue a higher degree who are temporarily ineligible for regular graduate admission status may be recommended by the Director of Graduate Studies for conditional admission status for a maximum of one full-time semester. Students should refer to *The Graduate School Bulletin* for further information. Special international cohorts are considered for admission to graduate programs prior to meeting the language proficiency and GRE/GMAT requirements. If granted conditional admission, students must meet the language and GRE/GMAT requirements prior to beginning the academic program of study.

Post-Baccalaureate Graduate Students (Nondegree-Seeking Students)

Students who hold a baccalaureate degree and who wish to pursue graduate study **without a degree objective** may apply for admission as post-baccalaureate graduate students. An overall undergraduate grade-point average of 2.5 or better and 3.0 on all previous graduate work is required by the Graduate School for admission to post-baccalaureate status.

Advanced Degrees for Faculty Members

Members of the faculty, except those in the Community College System, having a rank higher than that of instructor may not be considered as candidates for degrees in the discipline in which they are employed and hold academic rank.

DUAL DEGREE PROGRAMS

The University of Kentucky offers a number of dual degree programs; such programs require separate admission to each discipline involved. Dual degree programs currently in place are: J.D./M.H.A., J.D./M.B.A., J.D./M.P.A., M.D./M.B.A., M.D./M.P.H., Pharm.D./M.S.P.A.S., Pharm.D./M.S. in Pharmaceutical Sciences, Pharm.D./M.B.A., Pharm.D./M.P.A., Pharm.D./M.P.H., Pharm.D./M.S. in Economics, B.S. in Engineering/M.B.A., and B.S. in Engineering/M.P.A., M.P.H./M.H.A. Combined study leading to both the M.D. and Ph.D. is also available.

For more information on the dual degree programs, see *The Graduate School Bulletin*.

JOINT AND COOPERATIVE DOCTORAL PROGRAMS

Cooperative doctoral programs in education are offered between the University of Kentucky and other state universities: Eastern Kentucky University, Morehead State University, Murray State University, and Western Kentucky University. These programs permit qualified candidates to complete approximately one year of graduate work above the master's degree at the cooperating university, and the work of each candidate is directed by a joint faculty committee from both institutions.

Cooperative doctoral programs in musicology, physics, and higher education are offered between the University of Kentucky and the University of Louisville; a cooperative program in geology between the University of Kentucky and Eastern Kentucky University; and a cooperative program in history between the University of Kentucky and Western Kentucky University. A cooperative doctoral program in rehabilitation sciences is offered between the University of Kentucky, Eastern Kentucky University, Murray State University, and Western Kentucky University. The University of Kentucky and the University of Louisville share a joint Ph.D. program in Social Work.

For more information on joint and cooperative programs, see *The Graduate School Bulletin*.

INDEPENDENT STUDY PROGRAMS (Correspondence Courses)

No graduate credit is given for courses taken by correspondence.

REGISTRATION AND CLASSIFICATION

All students expecting graduate credit must be enrolled in the Graduate School. Graduate students will conform to the general registration schedule of the University and may not enter later than the last allowable date set by the University Registrar.

Before registering, a graduate student must obtain his or her advisor's approval of the proposed program.

ASSISTANTSHIPS, FELLOWSHIPS, STUDENT SUPPORT

Financial assistance is available in the form of assistantships and fellowships. An **assistantship** is an appointment to specified teaching or research duties. A **fellowship** is a non-service award made to superior students to assist in the pursuit of an advanced degree.

Assistantships

More than 1,500 teaching and research assistantships are available from departments and other units of the University. In addition to an assistantship stipend, full or partial tuition scholarships are available for most assistantship holders based on the number of hours per week in the assistantship. University-provided health insurance is offered for full-time assistants who meet the eligibility criteria.

The majority of assistantships are awarded for the academic year. Students interested in an assistantship should notify the appropriate Director of Graduate Studies by January for the next academic year; later applicants have a reduced chance of obtaining an assistantship. Most assistantship decisions are made by April for the coming academic year.

Notification of an assistantship comes from the program. Contact the Director of Graduate Studies in the program you seek to enter regarding the availability of positions or the status of assistantship offers. For more information on assistantships, visit the Web at: www.gradschool.uky.edu/fellowship/assistantships.html

Fellowships

Non-service fellowships are available in all areas of graduate work. The majority of these fellowships include a stipend as well as a tuition scholarship and university-provided student health insurance. While many fellowships are formally awarded by the Graduate School, nominations for most fellowships are made by the program in which a student seeks to enroll.

Fellowships are awarded for the academic year. Departments make most fellowship nominations by February for the next academic year, so students interested in a fellowship are strongly urged to contact the appropriate Director of Graduate Studies no later than January 15 for the next academic year. Notification of fellowship awards generally comes from the Graduate School before April 15.

Awards are sometimes offered before an applicant is officially admitted to the Graduate School; all awards offered are contingent upon admission to the program of study nominating the student. Post-baccalaureate (nondegree) students are not eligible for fellowship consideration, or for those tuition scholarships that accompany most assistantships.

For more information on fellowships, visit: www.research.uky.edu/gs/StudentFunding/fellowship_opportunities.html

Student Support

Funds are available to doctoral students enrolled in graduate programs for travel to present research at professional meetings. The amount of the award is variable, depending on the available budget each year. Application materials and information about deadlines are available on the Web at: www.research.uky.edu/gs/StudentFunding/supportfunding.html

Appendix EE

Research Proposals and
Grants (Sponsored
Projects Awards
through UKRF)

APPENDIX EE
Research Proposals and Grants (Sponsored Projects Awards through UKRF)

2016

- **Adedeji, Akinbode/Adedokun, Sunday.** * Extrusion Processing for Value-Added Production of Food and Feed, (3200000401), National Institute of Food and Agriculture, \$50,000.00
- **Adedokun, Sunday.** Evaluating the Effects of Two Sources of Sodium (NaCl and NaHCO₃) on Phytase Efficacy - Mineral Metabolism and Bone Ash in 21-d-old Broiler chickens, (3048113079), AB Vista, \$68,045.00
- **Adedokun, Sunday.** Enzyme effects on fibrous feed ingredients in cannulated pigs, (3048112836), DuPont, \$65,000.00
Adedokun, Sunday. An investigation into the effect of enzyme treatments on ileal and total tract digestibility of nutrients in 21d broiler chickens, (3048112948), DuPont, \$82,734.00
- **Amaral-Phillips, Donna.** Improving Fertility of Dairy Cattle Using Translational Genomics, (3200000572), University of Missouri, \$11,231.00
- **Amaral-Phillips, Donna.** Southeast Quality Milk Initiative: Implementing Science Based Recommendations in the Field, (3200000484), University of Tennessee, \$26,000.00
- **Bewley, Jeffrey.** SBIR: Diphenhydramine leads to dry-off acceleration and mastitis prevention, (3048112809), Amelgo LLC, \$62,697.00.
- **Bewley, Jeffrey/Arnold, Laura/Garkovich, Lorraine.** Southeast Quality Milk Initiative: Implementing Science-Based Recommendations to Control Mastitis & Improve Milk Quality in the Southeast, (3048110308), University of Tennessee, \$134,576.00
- **Bewley, Jeffrey/Donohue, Kevin/O'Hara, Bruce.** Living Up to Her Potential: Increasing Dairy Cow Productivity and Welfare Using an Improved Understanding of Sleep, (3200000429), Ohio State University, \$13,500.00.
- **Bewley, Jeffrey/Mark, Tyler.** Economic evaluation of DeLaval Herd Navigator, (3048112897), DeLaval International AB, \$10,500.00
- **Curry, Thomas/Bridges, Phillip/Jo, Misung.** * Ovulation and Luteal Formation in Rodents, Monkeys, and Women, (3200000306), National Institute of Child Health and Human Develop, \$1,247,194.00
- **Harmon, David.** Use of In Vitro Fermentation as a Comparative Measure of Ionophore Function, (3048110560), Zoetis LLC, \$176,705.00
- **Hennig, B.** Director's Conference Support: 2016 CEECHE, (3200000531), National Institute of Environmental Health Sciences, \$3,000.00
- **Hennig, B/Balk, Thomas/Bhattacharyya, Dibakar/Brewer, Dawn/Cassis, Lisa/Dziubla, Thomas/Gaetke, Lisa/Hilt, James/Hoover, Anna/Morris, Andrew/Ormsbee, Lindell/Pearson, Kevin/Pennell, Kelly/Stromberg, Arnold/Swanson, Hollie.** Nutrition and Superfund Chemical Toxicity, (3200000534), National Institute of Environmental Health Sciences, \$2,448,757.00
- **Hennig, B/Fondufe-Mittendorf, Yvonne/Pennell, Kelly.** 2016 Central and Eastern European Conference on Health and the Environment, (3200000381), National Institute of Environmental Health Sciences, \$40,000.00

- **Hennig, B/Gaetke, Lisa/Ormsbee, Lindell.** Fighting with Food: Battling Chemical Toxicity with Good Nutrition, (3048108838), Miami University, \$31,843.00
- **Lawrence, Laurie.** In vitro evaluation of an equine feed additive, (3048112817), Probiotech International Incorporated, \$9,591.00
- **Lawrence, Laurie.** Factors influencing phosphorus excretion, (3048112825), Waltham Centre for Pet Nutrition, \$19,800.00
- **Lehmkuhler, Jeffrey/Amaral-Phillips, Donna/Anderson, Leslie/Bullock, Kevin/Burdine, Kenneth/Burris, Walter/Halich, Gregory/Smith, Samuel.** Kentucky Beef Network VIII Master Education Series, (3048112360), Kentucky Beef Network, \$194,622.00
- **Lindemann, Merlin/Suman, Surendranath/Xiong, Youling.** Improving pork meat color with total mineral replacement technology, (3048112824), Alltech Biotechnology Inc, \$34,800.00
- **Matthews, James.** The Alltech-UK Animal Nutrigenomics Alliance, (3048044200), Alltech Biotechnology Inc, \$145,447.00
- **Newman, Melissa/Rentfrow, Gregg/Vijayakumar, Paul Priyesh/Woods, Timothy.** Southern Training, Education, Extension, Outreach, and Technical Assistance Center to Enhance Produce Safety, (3200000446), University of Florida, \$48,100.00
- **Pescatore, Anthony.** Student Sponsorship Fisher, (3048112077), Alltech Biotechnology Inc, \$18,900.00
- **Pescatore, Anthony.** Student Sponsorship--Woods, (3048112908), Alltech Biotechnology Inc, \$47,800.00
- **Pescatore, Anthony/Macalintal, Lizza.** Post Doctoral Fellow -- Lizza Macalintal, (3048112773), Alltech Biotechnology Inc, \$116,425.00
- **Smith, Samuel/Bewley, Jeffrey/Burdine, Kenneth.** * Develop Science-based Recommendations to Efficiently Manage Forages, Herd Health and Productivity on Organic Dairies in the Southeastern US, (3200000419), University of Tennessee, \$476,804.00
- **Vijayakumar, Paul Priyesh/Newman, Melissa/Rentfrow, Gregg.** Professional Training for Extension Agents in KY and OK in Food Safety and Sanitation Related to Farmer's Market, (3200000564), University of Georgia, \$78,166.00
- **Xiong, Youling.** Impact of algae supplemented diets combined with antioxidants on the nutrition profile, quality attributes, and storage stability of chicken broiler meat, (3048110787), Alltech Biotechnology Inc, (\$6,480.00)
- **Xiong, Youling.** Mechanism Studies for Rheological Property Enhancement of Pork Myofibrillar Proteins/Gels Induced by Oxidation and Enzyme Treatment, (3048113065), Ajinomoto Company Incorporated, \$60,000.00

2015

- **Amaral-Phillips, Donna.** Genomic Selection for Improved Fertility of Dairy Cows with Emphasis on Cyclicity and Pregnancy, (3048110433), Texas A&M University, \$18,788.00
- **Amaral-Phillips, Donna.** Improving Fertility of Dairy Cattle Using Translational Genomics, (3048110161), Washington State University, \$33,894.00

- **Bewley, Jeffrey.** Effects of supplementing rations differing in forage level with live yeast culture, (3048110069), Alltech Biotechnology Inc, \$30,240.00
- **Bewley, Jeffrey.** BHEARD Malawi Graduate Training in Dairy Management Systems, (3048111809), Michigan State University, \$170,522.00
- **Bewley, Jeffrey.** Elanco Dairy Decision Support, (3048111936), Elanco Animal Health, \$179,092.00
- **Bewley, Jeffrey.** Evaluation of formulations for a dry-off treatment for lactating dairy cows, (3048112024), Amelgo LLC, \$37,446.00
- **Bewley, Jeffrey.** Evaluation of a novel footbath delivery system, (3048112076), GEA Farm Technologies Incorporated, \$11,338.00
- **Bewley, Jeffrey.** Evaluation of peroxide teat dip, (3048112037), GEA Farm Technologies Incorporated, \$11,338.00
- **Bewley, Jeffrey.** Intramammary infusion for hastened evolution, (3048112604), Amelgo LLC, \$11,861.00
- **Bewley, Jeffrey.** Economics of automated body condition scoring, (3048112523), DeLaval International AB, \$13,975.00
- **Bewley, Jeffrey/Arnold, Laura/Garkovich, Lorraine.** Southeast Quality Milk Initiative: Implementing Science-Based Recommendations to Control Mastitis & Improve Milk Quality in the Southeast, (3048110308), University of Tennessee, \$130,871.00
- **Bewley, Jeffrey/Mark, Tyler.** Economics of automated estrus detection systems in New Zealand, (3048112591), DairyNZ, \$14,000.00
- **Boatright, William.** Plant Protein Off #Note Research Program, (3048112568), Campbell Soup Company, \$195,347.00
- **Carter, Craig/Vanzant, Eric.** * Animal Health Monitoring Field Testing, (3048112488), National Institute for Hometown Security, \$175,000.00
- **Carter, Craig/Vanzant, Eric.** * Use of Ear Tags for Early Disease Detection in Cattle, (3048111731), National Institute for Hometown Security, \$250,000.00
- **Harmon, David.** Use of In Vitro Fermentation as a Comparative Measure of Ionophore Function, (3048110560), Zoetis LLC, \$123,914.00
- **Harmon, David.** Fatty acid profile in ruminal content and blood plasma of finishing beef cattle, supplemented with different levels of marine algae., (3048112104), Alltech Biotechnology Inc, \$53,760.00
- **Harmon, David.** Student Sponsorship Agreement for Amanda Pesqueira, (3048111205), Alltech Biotechnology Inc, \$36,092.00
- **Hennig, B/Balk, Thomas/Bhattacharyya, Dibakar/Brewer, Dawn/Cassis, Lisa/Dziubla, Thomas/Gaetke, Lisa/Hilt, James/Hoover, Anna/Morris, Andrew/Ormsbee, Lindell/Pearson, Kevin/Pennell, Kelly/Stromberg, Arnold/Swanson, Hollie.** Nutrition and Superfund Chemical Toxicity, (3048112512), National Institute of Environmental Health Sciences, \$2,442,381.00
- **Hennig, B/Balk, Thomas/Bhattacharyya, Dibakar/Cassis, Lisa/Dziubla, Thomas/Gaetke, Lisa/Hilt, James/Hoover, Anna/Morris, Andrew/Ormsbee,**

- Lindell/Pearson, Kevin/Stromberg, Arnold/Swanson, Hollie.** Nutrition and Superfund Chemical Toxicity, (3048111373), National Institute of Environmental Health Sciences, \$5,000.00
- **Higdon, Andrea/Dwyer, Roberta/Newman, Melissa.** * EDEN Strengthening Community Agrosecurity Preparedness (S-CAP) Workshop Update, (3048110947), Purdue University, \$37,000.00
 - **Higdon, Andrea/Mullins, Janet/Newman, Melissa/Saha, Shubin.** * Using Sustainable Agriculture to Address Food Security Before, During, and After a Disaster, (3048112595), National Institute of Food and Agriculture, \$93,002.00
 - **Lawrence, Laurie.** Analysis of insulin concentrations, (3048112467), Alltech Biotechnology Inc, \$5,204.00
 - **Lehmkuhler, Jeffrey/Amaral-Phillips, Donna/Anderson, Leslie/Bullock, Kevin/Burdine, Kenneth/Burris, Walter/Halich, Gregory/Smith, Samuel.** Kentucky Beef Network VIII Master Education Series, (3048112360), Kentucky Beef Network, \$232,836.00
 - **Lindemann, Merlin.** Effect of a titrated dose response to β 1,3 Glucanase (CMG 3453) inclusion in corn-soybean meal diet containing a constant level of DDGS on growth performance of individually housed grower pigs, (3048112268), Elanco Animal Health, \$42,000.00
 - **Lindemann, Merlin/Xiong, Youling.** Effects of dietary antioxidant supplementation on DHA-enriched pork meat, (3048112123), Alltech Biotechnology Inc, \$16,380.00
 - **Matthews, James.** The Alltech-UK Animal Nutrigenomics Alliance, (3048044200), Alltech Biotechnology Inc, \$143,996.00
 - **Pescatore, Anthony.** Student Sponsorship Fisher, (3048112077), Alltech Biotechnology Inc, \$37,800.00
 - **Silvia, William.** Using heterospecific embryo transfer to study conceptus:uterine interactions in large bovids, (3048111445), National Institute of Food and Agriculture, \$207,769.00
 - **Vincent, Stacy/Coleman, Robert.** * 2015 TECHNICAL UPGRADE TRAINING: All About the Horse: Equine Management and Industry, (3048112586), KY Department of Education, \$3,500.00
 - **Xiong, Youling.** Impact of algae supplemented diets combined with antioxidants on the nutrition profile, quality attributes, and storage stability of chicken broiler meat, (3048110787), Alltech Biotechnology Inc, \$40,708.00
 - **Zhou, Changcheng/Cassis, Lisa/Hennig, B/Kern, Philip/Morris, Andrew/Park, Se Hyung/Sui, Yipeng.** * Mechanisms of atherogenic effects of bisphenol A, (3048111333), National Institute of Environmental Health Sciences, \$187,969.00

2014

- **Adams, Amanda/Horohov, David/Urschel, Kristine.** * Evaluating seasonal influences on hormone responses to a diagnostic test advocated for early diagnosis of equine Cushing's disease., (3048111103), Morris Animal Foundation, \$95,167.00
- **Amaral-Phillips, Donna.** DAIReXNET Leadership Funds, (3048111527), University of Nebraska, \$10,000.00

- **Amaral-Phillips, Donna.** Genomic Selection for Improved Fertility of Dairy Cows with Emphasis on Cyclicity and Pregnancy, (3048110433), Texas A&M University, \$16,416.00
- **Amaral-Phillips, Donna.** Improving Fertility of Dairy Cattle Using Translational Genomics, (3048110161), Washington State University, \$26,306.00
- **Bewley, Jeffrey.** Effects of Feeding Alltech SP1 to Lactating Dairy Cattle, (3048111279), Alltech Biotechnology Inc, \$3,360.00
- **Bewley, Jeffrey/Arnold, Laura/Garkovich, Lorraine.** Southeast Quality Milk Initiative: Implementing Science-Based Recommendations to Control Mastitis & Improve Milk Quality in the Southeast, (3048110308), University of Tennessee, \$127,051.00
- **Bullock, Kevin.** Integrated Program for Reducing Bovine Respiratory Disease Complex in beef and Dairy Cattle, (3048111433), Texas A&M Research Foundation, \$101,176.00
- **Harmon, David.** Student Sponsorship Agreement for Amanda Pesqueira, (3048111205), Alltech Biotechnology Inc, \$35,000.00
- **Harmon, David.** Use of In Vitro Fermentation as a Comparative Measure of Ionophore Function, (3048110560), Zoetis LLC, \$112,519.00
- **Hennig, B.** Editor of the Journal of Nutritional Sciences, (3048109205), Elsevier Science Inc, \$77,498.00
- **Hennig, B/Balk, Thomas/Bhattacharyya, Dibakar/Cassis, Lisa/Dziubla, Thomas/Gaetke, Lisa/Hilt, James/Hoover, Anna/Morris, Andrew/Ormsbee, Lindell/Pearson, Kevin/Stromberg, Arnold/Swanson, Hollie.** Nutrition and Superfund Chemical Toxicity, (3048111373), National Institute of Environmental Health Sciences, \$2,442,381.00
- **Hennig, B/Bhattacharyya, Dibakar/Black, Esther/Cassis, Lisa/Gaetke, Lisa/Morris, Andrew/Ormsbee, Lindell/Stromberg, Arnold/Swanson, Hollie/Wei, Yinan/Zhu, Haining.** Nutrition and Superfund Chemical Toxicity, (3048109306), National Institute of Environmental Health Sciences, \$150,000.00
- **Hennig, B/Gaetke, Lisa/Ormsbee, Lindell.** Fighting with Food: Battling Chemical Toxicity with Good Nutrition, (3048108838), Miami University, \$33,246.00
- **Hennig, B/Petriello, Michael.** * Fellowship for Petriello: Novel methodologies to quantify anti-inflammatory nitro-fatty acids, (3048110499), American Heart Association Great Rivers Affiliate, \$52,000.00
- **Higdon, Andrea/Dwyer, Roberta/Newman, Melissa.** * EDEN Strengthening Community Agrosecurity Preparedness (S-CAP) Workshop Update, (3048110947), Purdue University, \$41,323.00
- **Higdon, Andrea/Dwyer, Roberta/Newman, Melissa/Pickens, Chelsey.** * Improving Whole Community Animal and Agriculture Preparedness, (3048111073), National Institute of Food and Agriculture, \$76,016.00
- **Higdon, Andrea/Dwyer, Roberta/Newman, Melissa/Pickens, Chelsey.** * Multi-Jurisdictional Coordination Functional Exercise, (3048111022), Animal and Plant Health Inspection Service, \$44,501.00
- **Lehmkuhler, Jeffrey/Amaral-Phillips, Donna/Anderson, Leslie/Bullock, Kevin/Burdine, Kenneth/Burris, Walter/Halich, Gregory/Smith, Samuel.** Kentucky Beef Network, (3048110198), KY Beef Network, \$241,512.00

- **Lindemann, Merlin/Jang, Young Dal.** An Integrated Evaluation of the Nutrient Uplift Provided by Xylanase in Finishing Diets, (3048111043), National Pork Board, \$93,000.00
- **Matthews, James.** The Alltech-UK Animal Nutrigenomics Alliance, (3048044200), Alltech Biotechnology Inc, \$180,000.00
- **Matthews, James/Burris, Walter/Lindemann, Merlin.** Regulation of EAAC1 Controllers to Enable Efficient Nutrient Metabolism, (3048111117), National Institute of Food and Agriculture, \$373,798.00
- **Pescatore, Anthony.** Farming for cash: An apprenticeship program for Kentucky's beginning limited-resource and small-scale farmers, (3048110795), KY State University, \$100,000.00
- **Pescatore, Anthony.** Small and Backyard Flocks CoP Support Funds 2014, (3048111528), University of Nebraska, \$10,000.00
- **Squires, Edward/Ball, Barry/Lawrence, Laurie/Troedsson, Mats.** * Effect of feeding DHA on sperm motion characteristics, sperm viability and fatty acid composition of stallion sperm, (3048111262), Alltech Biotechnology Inc, \$83,272.00
- **Suman, Surendranath.** Proteome basis of pale, soft, and exudative condition in broiler meat, (3048111349), Mississippi State University, \$50,000.00
- **Urschel, Kristine.** Analysis of plasma samples for changes in glucose and amino acid concentrations in response to algae supplementation, (3048110875), Alltech Biotechnology Inc, \$1,400.00
- **Xiong, Youling.** Impact of algae supplemented diets combined with antioxidants on the nutrition profile, quality attributes, and storage stability of chicken broiler meat, (3048110787), Alltech Biotechnology Inc, \$40,708.00
- **Zhou, Changcheng/Cassis, Lisa/Charnigo, Richard/Hennig, B/Morris, Andrew/Park, Se Hyung/Sui, Yipeng/Van Der Westhuyzen, Deneys.** * Endocrine disruptor mediated activation of PXR causes dyslipidemia, (3048110966), National Institute of Environmental Health Sciences, \$332,520.00
- **Zhou, Changcheng/Cassis, Lisa/Hennig, B/Kern, Philip/Morris, Andrew/Park, Se Hyung/Sui, Yipeng.** * Mechanisms of atherogenic effects of bisphenol A, (3048111333), National Institute of Environmental Health Sciences, \$225,000.00

2013

- **Amaral-Phillips, Donna.** Genomic Selection for Improved Fertility of Dairy Cows with Emphasis on Cyclicity and Pregnancy, (3048110433), Texas A&M University, \$15,492.00
- **Amaral-Phillips, Donna.** Improving Fertility of Dairy Cattle Using Translational Genomics, (3048110161), Washington State University, \$9,641.00
- **Bewley, Jeffrey.** Effects of supplementing rations differing in forage level with live yeast culture, (3048110069), Alltech Biotechnology Inc, \$43,027.00
- **Bewley, Jeffrey/Arnold, Laura/Day, George/Jacobsen, Krista/Taraba, Joseph.** A Preliminary Assessment of the Potential for Compost Bedded Pack Barns in Sustainable Organic Dairy Farming Systems, (3048109491), Organic Valley Family of Farms, \$4,909.00

- **Bewley, Jeffrey/Arnold, Laura/Eckelkamp, Elizabeth/Taraba, Joseph.** Clinical Mastitis Incidence in Compost Bedded Pack Barns as Compared to Freestall Barns, (3048110318), University of Georgia, \$13,750.00
- **Bewley, Jeffrey/Arnold, Laura/Garkovich, Lorraine.** Southeast Quality Milk Initiative: Implementing Science-Based Recommendations to Control Mastitis & Improve Milk Quality in the Southeast, (3048110308), University of Tennessee, \$126,011.00
- **Bewley, Jeffrey/Lau, Daniel.** KSEF RDE: Automation of Dairy Cattle Body Condition Scoring through Image Processing, (3048109756), KY Science and Technology Co Inc, \$49,872.00
- **Bewley, Jeffrey/Smith, Samantha.** Assessment of Heat Stress in Kentucky Dairy Cows, (3048110302), KY Academy of Science Foundation, \$3,000.00
- **Bewley, Jeffrey/Taraba, Joseph.** Compost Bedded Pack Dairy Barn Management, (3048110135), KY Governor's Office of Agricultural Policy, \$53,875.00
- **Harmon, David.** Use of In Vitro Fermentation as a Comparative Measure of Ionophore Function, (3048110560), Zoetis LLC, \$40,120.00
- **Hennig, B.** Editor of the Journal of Nutritional Sciences, (3048109205), Elsevier Science Inc, \$75,978.00
- **Hennig, B/Gaetke, Lisa/Ormsbee, Lindell.** Fighting with Food: Battling Chemical Toxicity with Good Nutrition, (3048108838), Miami University, \$62,122.00
- **Higdon, Andrea/Newman, Melissa/Yeargan, Ricky.** * Strengthening community agrosecurity preparedness: Building National Networks and Partnerships, (3048109744), National Institute of Food and Agriculture, \$66,180.00
- **Lawrence, Laurie.** Dietary mitigation of antibiotic-induced changes in equine hindgut bacteria, (), KY Horse Racing Commission, \$86,471.00
- **Lawrence, Laurie.** Oats-preventing equine disease:role of starch source in large intestinal microbial disturbances, (3048110319), Prairie Oat Growers Association, \$122,601.00
- **Lehmkuhler, Jeffrey/Amaral-Phillips, Donna/Anderson, Leslie/Bullock, Kevin/Burdine, Kenneth/Burris, Walter/Halich, Gregory/Smith, Samuel.** Kentucky Beef Network, (3048110198), KY Beef Network, \$243,735.00
- **Matthews, James.** The Alltech-UK Animal Nutrigenomics Alliance, (3048044200), Alltech Biotechnology Inc, \$74,000.00
- **Meyer, Alphonse/Bewley, Jeffrey/Hunter, Jennifer/Isaacs, Steven/Katchova, Ani/Ritchey, Edwin.** * KyFarmStart II: A Whole Farm Management Education Program for Beginning Farmers, (3048109667), National Institute of Food and Agriculture, \$561,564.00
- **Pescatore, Anthony.** Student Sponsorship Good, (3048109645), Alltech Biotechnology Inc, \$28,710.00
- **Pescatore, Anthony.** Student Sponsorship van Benschoten, (3048109646), Alltech Biotechnology Inc, \$72,450.00
- **Pescatore, Anthony.** Student sponsorship Fisher, (3048109647), Alltech Biotechnology Inc, \$53,550.00
- **Pescatore, Anthony/Jacob, Jacqueline.** Use of Natural Remedies to Alleviate Enteric Pathogens in Organic Poultry, (3048109252), Agricultural Research Service, \$83,381.00

- **Urschel, Kristine.** Threonine nutrition in growing and mature horses: effect of diet composition on threonine requirements, (3048109383), National Institute of Food and Agriculture, \$460,000.00
- **Xiong, Youling.** Nutrigenomics Applied to Meat Science: Understanding the impact of Alltech Antioxidant Nutrients on the Quality and Storage Stability of Chicken Meat, (3048107592), Alltech Biotechnology Inc, \$52,428.00

2012

- **Amaral-Phillips, Donna.** DAIReXNET- eXtension National Web Resource, (3048109134), University of Nebraska, \$12,500.00
- **Bewley, Jeffrey.** Characterization of Breed Differences in Core Body Temperature, Lying Behavior, Rumination Behavior, and Quarter-Level Milk Conductivity, (3048109250), American Jersey Cattle Association, \$7,992.00
- **Burris, Walter/Anderson, Leslie/Bullock, Kevin/Lehmkuhler, Jeffrey.** Master Cattleman Program, (3048108057), KY Beef Network, \$281,394.00
- **Cantor, Austin.** Student Sponsorship Agreement for Lizza Macalintal, (3048104339), Alltech Biotechnology Inc, \$14,310.00
- **Harmon, David.** Effects of basal diet, DIP source and level on the growth performance of feedlot cattle, (3048109203), Alltech Biotechnology Inc, \$20,497.00
- **Hennig, B.** Editor of the Journal of Nutritional Sciences, (3046478900), Elsevier Science Inc, \$48,103.00
- **Hennig, B/Bhattacharyya, Dibakar/Black, Esther/Cassis, Lisa/Gaetke, Lisa/Morris, Andrew/Ormsbee, Lindell/Stromberg, Arnold/Swanson, Hollie/Wei, Yinan/Zhu, Haining.** Nutrition and Superfund Chemical Toxicity, (3048109306), National Institute of Environmental Health Sciences, \$2,094,986.00
- **Hennig, B/Bhattacharyya, Dibakar/Black, Esther/Cassis, Lisa/Gaetke, Lisa/Ormsbee, Lindell/Stromberg, Arnold/Swanson, Hollie/Toborek, Michal/Wei, Yinan/Zhu, Haining.** Nutrition and Superfund Chemical Toxicity, (3048108140), National Institute of Environmental Health Sciences, \$49,500.00
- **Hennig, B/Gaetke, Lisa/Ormsbee, Lindell.** Fighting with Food: Battling Chemical Toxicity with Good Nutrition, (3048108838), Miami University, \$32,836.00
- **Husband, Andrea/Dwyer, Roberta/Newman, Melissa/Priddy, Kenny/Yeargan, Ricky. *** The EDEN Strengthening Community Agrosecurity Planning (S-CAP) Train-the-Trainer Project: Phase 2, (3048106917), Purdue University, \$51,500.00
- **Matthews, James.** Student Sponsorship Agreement- Zhi Zhang, (3048108183), Alltech Biotechnology Inc, \$7,292.00
- **Pescatore, Anthony/Cantor, Austin/Rentfrow, Gregg.** Profitable and Sustainable Poultry Production on Small- and Medium-Sized Farms, (3048109449), National Institute of Food and Agriculture, \$349,999.00
- **Pescatore, Anthony/Jacob, Jacqueline.** Use of Natural Remedies to Alleviate Enteric Pathogens in Organic Poultry, (3048109252), Agricultural Research Service, \$69,349.00
- **Pescatore, Anthony/Quant, Anthony.** Student Sponsorship Agreement for Anthony Quant, (3048105347), Alltech Biotechnology Inc, \$24,300.00
- **Suman, Surendranath.** Assessing the Role of Mitochondrial Proteome in Beef Color Stability, (3048108964), University of Connecticut, \$50,000.00

- **Suman, Surendranath.** Characterization of Protein Expression in Catfish Fillets with Red Pigmentation, (3048109127), Mississippi State University, \$40,000.00
- **Suman, Surendranath/Rentfrow, Gregg.** Proteome profile of economically important muscles in beef hindquarters, (3048108852), National Institute of Food and Agriculture, \$421,112.00
- **Taraba, Joseph/Bewley, Jeffrey/Day, George/Missun, Traci.** * Compost bedded pack barn housing system for dairy manure storage/treatment, (3048108607), Natural Resources Conservation Service, \$132,941.00
- **Toborek, Michal/Hennig, B/Zhu, Haining.** * Implications of Caveolae in Tat Signaling and Integrity of Brain Endothelium, (3048105020), National Institute of Mental Health, (\$168,305.00)
- **Urschel, Kristine.** The effects of Creep Feeding pre-Weaning Foals on Whole Body Protein Synthesis Determined Using Istopes Infusion and Stochastic Analysis, (3048107299), Waltham Centre for Pet Nutrition, \$25,000.00
- **Urschel, Kristine.** Analysis of digesta and feed for amino acid composition, (3048109458), Alltech Biotechnology Inc, \$1,500.00

Appendix FF

Lab Assignments in W.P. Garrigus Building

APPENDIX FF - Lab Assignments in W.P. Garrigus Building

Updated August 2017

Room	Description	PI in charge	PI contact info	
			Phone	E-mail
2nd floor				
216A	Sensory evaluation	Gregg Rentfrow Youling Xiong	7-7550 7-3822	Gkrent2@uky.edu ylxiong@uky.edu
216B	Kitchen (sensory prep)	Gregg Rentfrow Youling Xiong	7-7550 73822	Gkrent2@uky.edu ylxiong@uky.edu
216C	Instron room	Youling Xiong	7-3822	ylxiong@uky.edu
216D	Food carbohydrates	Rachel Schendel	7-7538	rachel.schendel@uky.edu
216E	Storage	James Matthews	7-7513	jmatthew@uky.edu
218	Animal physiology/ nutrition	James Matthews	7-7513	jmatthew@uky.edu
218A	Walk-in cooler	James Matthews	7-7513	jmatthew@uky.edu
218B	Animal physiology	Phil Bridges	7-4877	pbrid2@uky.edu
218C	Chemical storage	Phil Bridges	7-4877	pbrid2@uky.edu
218D	Image analyzer	James Matthews	7-7513	jmatthew@uky.edu
220	Animal physiology/nutrition	James Matthews	7-7513	jmatthew@uky.edu
220A	Cell culture	James Matthews	7-7513	jmatthew@uky.edu
221	Food microbiology	Melissa Newman	7-5881	mnewman@uky.edu
4th floor				
416	Food lipids/flavors	William Boatright	7-5988	wboat1@uky.edu
417	Food proteins	Youling Xiong	7-3822	ylxiong@uky.edu
418	Food proteins	Youling Xiong	7-3822	ylxiong@uky.edu
419	Meat pigments/proteomics	Surendranath Suman	7-3428	S.Suman@uky.edu
420	Office/storage	William Silvia/Susan Hayes	7-7545	wsilvia@uky.edu
421	Dairy Behavior	Costa	7-7545	
6th floor				
616	Equine nutrition/health	Kristine Urschel Laurie Lawrence Robert Colemon	7-7748 7-7509 7-9451	klurschel@uky.edu llawrenc@uky.edu rcoleman@uky.edu
618	Swine nutrition Equine nutrition/health	Merlin Lindemann Mary Rossano	7-7524 7-7552	mdlind1@uky.edu Mary.Rossano@uky.edu
619	Equine nutrition/health	Laurie Lawrence	7-7509	llawrenc@uky.edu
620	Walk-in cooler	Merlin Lindemann	7-7524	mdlind1@uky.edu
621	Poultry nutrition	Tayo Adedokun	7-3821	tayo.adedokun@uky.edu
8th floor				
816 (and A,B)	Beef nutrition	David Harmon Kyle McLeod Eric Vanzant	7-7516 7-2892 7-9438	dharmon@uky.edu kmcleod@uky.edu evanzant@uky.edu
818 (and A,B,C,D)	Beef nutrition	David Harmon/Kyle McLeod Eric Vanzant/Don Ely	7-2717	dely@uky.edu
820	Walk-in cooler	David Harmom	7-7516	dharmon@uky.edu
821	Nutrigenomics	David Harmom Kyle McLeod	7-7516 7-2892	dharmon@uky.edu kmcleod@uky.edu
Basement	Meat lab	Gregg Rentfrow	7-7550	Gkrent2@uky.edu
Basement	Food processing lab	William Boatright	7-7988	wboat1@uky.edu

Appendix GG

CAFE Research Lab Space Review

APPENDIX GG - CAFE Research Lab Space Review

Summary of Committee Rankings of CAFE Research Buildings.

Quality Rankings of Research Laboratory Facilities (Best to Worst).

Same number indicates the same quality ranking.

1. Barnhardt Bldg (BAE), KTRDC, Plant and Soil Sciences (PSS)
2. Ag. North, Gluck
3. Garrigus
4. T.P. Cooper (Forestry)
5. Dimmock

Buildings 3,4, and 5 have serious structural issues that would make it difficult to achieve adequate laboratories by simple cosmetic renovations. Ag North and Gluck have a mixture of nice quality, recently renovated lab spaces that had been revamped for particular faculty or research groups, and older, un-renovated spaces of much lower quality.

Level of Apparent Utilization (Most utilized to least).

All buildings had some spaces that were more heavily utilized than others. All buildings seemed to lack sufficient storage space, meaning that lab or office space was often utilized for storage instead of for people.

1. Garrigus
2. Ag North
3. BAE
4. Gluck, KTRDC
5. PSS
6. Cooper
7. Dimmock

Suitability of Spaces for Research Being Done There (Most to least).

1. PSS (current priority is a need for more plant growth space and more space for large equipment).
KTRDC (being actively renovated, less plant more analytical/chemical)
BAE (nice, very specialized space but no room for expansion).
2. Ag North (mix of suitable renovated space, and unsuitable, older space.)
Gluck (mix of suitable renovated space and older specialized spaces no longer being used for original purpose).
3. Garrigus (many areas are less than adequate for lab research, but AS faculty “making do”. Many specialized research spaces, now in poor repair and inadequate for scale of work being done there). SEE ATTACHMENT
Forestry (largely unsuitable for laboratory research: Forestry faculty have adapted to these challenges by emphasizing field studies. The building currently limits the scope for expansion of department mission, especially if it involves new faculty with lab-centered programs). SEE ATTACHMENT
4. Dimmock (largely unsuitable for many types of contemporary laboratory research. The building could be used for storage and as a staging area for field research).

GARRIGUS BUILDING LAB SPACE REVIEW

Building	Room #	Floor	Department	sq ft	Function	Activity/ Utilization	Space Suitability	Quality of Facilities	Comments
GARRIGUS BUILDING (0215)	0216C	2	Animal Sciences (81070)	248	Research/Non-class DRY laboratory (252)	4	3	4	Equipment storage
GARRIGUS BUILDING (0215)	0216D	2	Animal Sciences (81070)	492	Research/Non-class WET laboratory (251)	5	4	2	Cheese laboratory (Dairy Chemistry)
GARRIGUS BUILDING (0215)	0216E	2	Animal Sciences (81070)	242	Research/Non-class wet lab service (256)	5	2	2	Contains centrifuges: Needs addition of electrical outlets/support, which would enable equipment to be relocated from primary lab to free up space.
GARRIGUS BUILDING (0215)	218	2	Animal Sciences (81070)	895	Research/Non-class WET laboratory (251)	5	3	2	Molecular biology lab - reproductive physiology, sinks leak, electrical power issues, old equipment and used gas tanks stored here, taking up valuable space.
GARRIGUS BUILDING (0215)	0218A	2	Animal Sciences (81070)	117	Research/Non-class wet lab service (256)	5	4	3	Cold room
GARRIGUS BUILDING (0215)	0218B	2	Animal Sciences (81070)	600	Research/Non-class WET laboratory (251)	4	4	2	Molecular biology lab, electrical power issues: power inadequate for equipment.
GARRIGUS BUILDING (0215)	0218C	2	Animal Sciences (81070)	148	Research/Non-class wet lab service (256)	4	4	2	Storage, weighing room.
GARRIGUS BUILDING (0215)	0218D	2	Animal Sciences (81070)	146	Research/Non-class wet lab service (256)	5	4	2	Molecular biology imaging equipment
GARRIGUS BUILDING (0215)	220	2	Animal Sciences (81070)	292	Research/Non-class WET laboratory (251)	5	3	2	RNA work - very tight space
GARRIGUS BUILDING (0215)	0220A	2	Animal Sciences (81070)	148	Research/Non-class WET laboratory (251)	5	3	2	Cell culture and radioisotope work
GARRIGUS BUILDING (0215)	0221A	2	Animal Sciences (81070)	82	Research/Non-class wet lab service (256)	5	3	2	Storage, with incubator
GARRIGUS BUILDING (0215)	0221B	2	Animal Sciences (81070)	78	Research/Non-class wet lab service (256)	5	3	3	Cooler
GARRIGUS BUILDING (0215)	0221C	2	Animal Sciences (81070)	81	Research/Non-class wet lab service (256)	5	3	3	Cooler
GARRIGUS BUILDING (0215)	0221D	2	Animal Sciences (81070)	148	Research/Non-class WET laboratory (251)	5	3	2	Medium preparation
GARRIGUS BUILDING (0215)	0221E	2	Animal Sciences (81070)	139	Research/Non-class wet lab service (256)	5	3	3	Autoclave
GARRIGUS BUILDING (0215)	0221F	2	Animal Sciences (81070)	144	Research/Non-class wet lab service (256)	5	3	2	Instrument Room
GARRIGUS BUILDING (0215)	416	4	Animal Sciences (81070)	593	Research/Non-class WET laboratory (251)	5	4	2	Communal space, food science. Old lab benches, very short of storage and bench space.
GARRIGUS BUILDING (0215)	0416A	4	Animal Sciences (81070)	86	Research/Non-class dry lab service (257)	5	4	3	Freezer
GARRIGUS BUILDING (0215)	0416B	4	Animal Sciences (81070)	193	Research/Non-class WET laboratory (251)	5	4	2	Instruments and office space.
GARRIGUS BUILDING (0215)	417	4	Animal Sciences (81070)	592	Research/Non-class WET laboratory (251)	5	4	2	Meat Protein Lab. Ventillation challenges, fine black particulate matter coming out of air ducts, possibly breakdown of insulation material in ducts, possible human health issue (THIS WAS THROUGHOUT THE BUILDING). There were also frequently mentioned issues with fume hoods: pulling in volatiles from the hoods in use to other labs. Potentially very hazardous conditions for personnel working in these labs.
GARRIGUS BUILDING (0215)	418	4	Animal Sciences (81070)	590	Research/Non-class WET laboratory (251)	5	4	2	Meat Protein Lab, including several pieces of communal equipment.
GARRIGUS BUILDING (0215)	419	4	Animal Sciences (81070)	1208	Research/Non-class WET laboratory (251)	5	4	2	Food Science Lab: very cluttered, really need more storage.
GARRIGUS BUILDING (0215)	0419B	4	Animal Sciences (81070)	156	Research/Non-class WET laboratory (251)	5	4	3	Cooler
GARRIGUS BUILDING (0215)	421	4	Animal Sciences (81070)	1192	Research/Non-class WET laboratory (251)	5	4	2	Bone Lab. Very cramped, TERRIBLE odors from active dermestid colony on lab bench and decaying animal parts, very unhealthy.
GARRIGUS BUILDING (0215)	616	6	Animal Sciences (81070)	1193	Research/Non-class WET laboratory (251)	5	4	2	Swine Lab Tight for space. Many faculty share this space and there is very little storage space or room for students.

Building	Room #	Floor	Department	sq ft	Function	Activity/ Utilization	Space Suitability	Quality of Facilities	Comments
GARRIGUS BUILDING (0215)	618	6	Animal Sciences (81070)	1194	Research/Non-class WET laboratory (251)	5	4	2	Swine Lab Parasitology. Desperate need for more freezer space for large animal parts and carcasses. Many freezers inoperable, and the ones that are working are too small to store research samples adequately.
GARRIGUS BUILDING (0215)	0618B	6	Animal Sciences (81070)	148	Research/Non-class WET laboratory (251)	5	4	3	New fat extraction instrument, communal.
GARRIGUS BUILDING (0215)	619	6	Animal Sciences (81070)	590	Research/Non-class WET laboratory (251)	5	5	3	Radioisotope work, communal space.
GARRIGUS BUILDING (0215)	620	6	Animal Sciences (81070)	117	Research/Non-class wet lab service (256)	5	4	3	Cooler
GARRIGUS BUILDING (0215)	621	6	Animal Sciences (81070)	1190	Research/Non-class WET laboratory (251)	5	4	2	Poultry and swine. Very cramped, several faculty including a new faculty member share this space. Challenges include inadequate storage space and water leaks. In fact water leaks were an issue throughout the building and most labs had sensitive instruments covered in plastic to protect from water damage and particulates. Very unacceptable.
GARRIGUS BUILDING (0215)	0621A	6	Animal Sciences (81070)	145	Research/Non-class wet lab service (256)	5	4	2	Contiguous with 619: Radioisotope work, communal space.
GARRIGUS BUILDING (0215)	816	8	Animal Sciences (81070)	992	Research/Non-class WET laboratory (251)	5	4	2	Storage room.
GARRIGUS BUILDING (0215)	0816A	8	Animal Sciences (81070)	142	Research/Non-class WET laboratory (251)	5	4	2	Instrument Room
GARRIGUS BUILDING (0215)	0816B	8	Animal Sciences (81070)	145	Research/Non-class WET laboratory (251)	5	4	2	
GARRIGUS BUILDING (0215)	818	8	Animal Sciences (81070)	1307	Research/Non-class WET laboratory (251)	5	4	2	Beef labs: several faculty share this suite of labs. Same problems elsewhere with water, dust, lack of storage, antique lab fittings. Lots of freestanding units being used for storage which is not ideal from a safety perspective.
GARRIGUS BUILDING (0215)	0818A	8	Animal Sciences (81070)	189	Research/Non-class WET laboratory (251)	5	4	2	
GARRIGUS BUILDING (0215)	0818B	8	Animal Sciences (81070)	192	Research/Non-class WET laboratory (251)	5	4	2	Chemical storage, balance room.
GARRIGUS BUILDING (0215)	0818C	8	Animal Sciences (81070)	141	Research/Non-class WET laboratory (251)	5	4	2	Instrument room, GC HPLC
GARRIGUS BUILDING (0215)	0818D	8	Animal Sciences (81070)	138	Research/Non-class WET laboratory (251)	5	4	2	Instrument Room
GARRIGUS BUILDING (0215)	819	8	Animal Sciences (81070)	114	Research/Non-class wet lab service (256)	1	1	1	Freezer, not working
GARRIGUS BUILDING (0215)	820	8	Animal Sciences (81070)	115	Research/Non-class wet lab service (256)	5	4	3	Walk in cooler
GARRIGUS BUILDING (0215)	821	8	Animal Sciences (81070)	47	Research/Non-class wet lab service (256)	5	4	3	GLP lab, refurbishment in process.
GARRIGUS BUILDING (0215)	0821A	8	Animal Sciences (81070)	589	Research/Non-class WET laboratory (251)	5	5	3	Empty transitioning space: will be office space.
GARRIGUS BUILDING (0215)	0821C	8	Animal Sciences (81070)	576	Research/Non-class wet lab service (256)	1	1	2	Long Term storage: boxes, file cabinets, miscellaneous. Like an attic! Wasted space.
Basement									
GARRIGUS BUILDING (0215)	B0001	0	Animal Sciences (81070)	330	Research/Non-class wet lab service (256)	2	1	1	Chemical storage, barrels of solvents, looks very old. Too damp for storage in metal barrels. Not sufficiently secure.
GARRIGUS BUILDING (0215)	B0033	0	Animal Sciences (81070)	61	Research/Non-class wet lab service (256)	4	3	3	Salting of meats
GARRIGUS BUILDING (0215)	B0034	0	Animal Sciences (81070)	106	Research/Non-class wet lab service (256)	4	3	3	Curing of meats
GARRIGUS BUILDING (0215)	B0034A	0	Animal Sciences (81070)	48	Research/Non-class WET laboratory (251)	4	3	3	Fermentation Room
GARRIGUS BUILDING (0215)	B0036	0	Animal Sciences (81070)	54	Research/Non-class WET laboratory (251)	4	3	2	Aging of hams: these rooms are inadequate for the purpose because of pipes on the ceiling that hold dust, risk of food contamination.

Building	Room #	Floor	Department	sq ft	Function	Activity/ Utilization	Space Suitability	Quality of Facilities	Comments
GARRIGUS BUILDING (0215)	B0036A	0	Animal Sciences (81070)	53	Research/Non-class WET laboratory (251)	4	3	2	Aging of hams: these rooms are inadequate for the purpose because of pipes on the ceiling that hold dust, risk of food contamination.
GARRIGUS BUILDING (0215)	B0038	0	Animal Sciences (81070)	779	Research/Non-class WET laboratory (251)	4	3	2	"Kill" floor, exposed pipes and recesses on ceiling represent a hygiene challenge, risk of contamination, and danger to workers because of inadequate head space and cramped conditions.
GARRIGUS BUILDING (0215)	B0038A	0	Animal Sciences (81070)	105	Research/Non-class WET laboratory (251)	4	3	3	Cooler for storage of viscera
GARRIGUS BUILDING (0215)	B0039	0	Animal Sciences (81070)	208	Research/Non-class wet lab service (256)	5	4	2	Cooler: generally cooler space is inadequate to serve both the meat shop and research.
GARRIGUS BUILDING (0215)	B0040	0	Animal Sciences (81070)	261	Research/Non-class wet lab service (256)	5	4	2	Cooler
GARRIGUS BUILDING (0215)	B0041	0	Animal Sciences (81070)	856	Research/Non-class WET laboratory (251)	4	3	2	Cutting room, exposed pipes and recesses on ceiling represent a hygiene challenge.
GARRIGUS BUILDING (0215)	B0041A	0	Animal Sciences (81070)	129	Research/Non-class wet lab service (256)	4	3	3	Storage
GARRIGUS BUILDING (0215)	B0042	0	Animal Sciences (81070)	185	Research/Non-class wet lab service (256)	4	3	3	Trolley Storage
GARRIGUS BUILDING (0215)	B0043	0	Animal Sciences (81070)	158	Research/Non-class wet lab service (256)	3	3	3	Hallway
GARRIGUS BUILDING (0215)	B0044	0	Animal Sciences (81070)	319	Research/Non-class wet lab service (256)	4	3	2	Packing room, exposed pipes and recesses on ceiling represent a hygiene challenge, not enough outlets to run equipment.
GARRIGUS BUILDING (0215)	B0045	0	Animal Sciences (81070)	241	Research/Non-class WET laboratory (251)	4	3	3	"Smoke House" room
GARRIGUS BUILDING (0215)	B0046	0	Animal Sciences (81070)	71	Research/Non-class wet lab service (256)	5	3	2	Freezer, doorway too small, overall space inadequate
GARRIGUS BUILDING (0215)	B0047	0	Animal Sciences (81070)	74	Research/Non-class wet lab service (256)	5	3	2	Freezer, doorway too small, overall space inadequate
GARRIGUS BUILDING (0215)	B0048	0	Animal Sciences (81070)	75	Research/Non-class wet lab service (256)	1	1	2	Freezer, broken, doorway too small, overall space inadequate
GARRIGUS BUILDING (0215)	B0049	0	Animal Sciences (81070)	1159	Research/Non-class WET laboratory (251)	4	3	3	Teaching area, storage
GARRIGUS BUILDING (0215)	B0049A	0	Animal Sciences (81070)	137	Research/Non-class wet lab service (256)	4	3	3	Storage
GARRIGUS BUILDING (0215)	B0049B	0	Animal Sciences (81070)	96	Research/Non-class WET laboratory (251)	4	3	3	Spice room

Additional Rooms not on original list

GARRIGUS BUILDING (0215)	216 A	0	Animal Sciences (81070)	241	Research/Non-class WET laboratory (251)	2	3	3	Sensory lab - taste testing
GARRIGUS BUILDING (0215)	216 B	0	Animal Sciences (81070)	71	Research/Non-class wet lab service (256)	2	3	3	Sensory lab - kitchen
GARRIGUS BUILDING (0215)	218 E	0	Animal Sciences (81070)	74	Research/Non-class wet lab service (256)	3	3	3	Storage
GARRIGUS BUILDING (0215)	221	0	Animal Sciences (81070)	75	Research/Non-class wet lab service (256)	4	3	2	Food microbiology, cramped space, narrow walkways, inadequate storage
GARRIGUS BUILDING (0215)	419 A	0	Animal Sciences (81070)	1159	Research/Non-class WET laboratory (251)	3	3	3	desk space
GARRIGUS BUILDING (0215)	619 A	0	Animal Sciences (81070)	137	Research/Non-class wet lab service (256)	3	3	3	Student desk space
GARRIGUS BUILDING (0215)	619 B	0	Animal Sciences (81070)	96	Research/Non-class WET laboratory (251)	3	3	3	Student desk space

GENERAL ISSUES IN GARRIGUS:

Water leaks

Ventilation Problems.

Dust/black particulates

Antique lab fittings including porous countertops, small and inadequate sinks that leak, lack of closed shelf built in storage, nasty peeling floor tiles.

Laboratory Infrastructure Needs/Issues that Limit Research Productivity

Lab #	Need/Issue
All	Maintenance of adequate walk-in cooler/freezer space for samples.
All	Water leaks from ceiling.
105	Need more circuit breakers for the teaching lab in 105. Can currently only use 2 hot plates per bench without tripping the breaker. This means lab groups need to share hot plates occasionally.
216B	Need more circuit breakers on the wall outlets next to the taste panel "boxes". We've tripped the breaker when attempting to perform cooking loss.
221	Inadequate number of electrical outlets on lab benches.
221	Space for storage of lab materials so I don't have to use valuable lab bench space.
221ABC	Maintenance of coolers.
416	Ventilation that will maintain proper room temperature.
416	Electrical outlets that function properly.
416	Need a new sink that is not divided to accommodate larger glassware.
416	Nonporous bench tops are needed.
416	Need storage space for lab supplies (e.g., shelving over center island lab bench).
416	Need office space for lab tech out of lab to free up space for lab equipment/lab work.
417	Lack of electrical outlets on 417 center lab bench. Only the middle outlet is wired. The ones on either end are present but were never wired.
417	Inadequate ventilation can lead to smells from the hoods coming back into the labs depending upon the weather conditions. This issue has been brought to attention of OHS in the past.
419	Shelves/cabinets for storage – Currently we don't have any shelves. Having either deck-mounted shelves on lab benches and wall-mounted storage cabinet will save a lot of space.
419	Laboratory Countertops and Bench Tops – Current ones are metal and are obsolete. Epoxy Resin or Phenolic Resin tops are common in other universities in similar labs; they are waterproof and easy to clean.
419	Ventilation system – We get a lot of black dust blown into labs along with the air, resulting in contamination of samples.
419	Lab sinks and faucets – Existing sinks are not easy to clean and are very dirty; some faucets are non-functioning. Stainless steel sinks are common in other universities in similar labs.
419	Walk-in cooler in 419 – The cooler is not at all reliable, in terms of temperature settings.
419	Water leaks from ceilings and foul odor from floor drains – Common year-round problem.
419	Electrical outlets – Their number and quality are insufficient to meet the demand of 21st century analytical labs.
616	Ventilation system does not work properly. Strong odors from chemicals/fecal/rumen contents (aka poop soup) that are used or processed on different floors can be detected in this lab as well as the labs below me. Also, there is a lack of proper room temperature control in the lab. Our heating and air conditioning needs to be fixed two to three times a year.
616	A dedicated acid hood is needed (in addition to the current hood that exists).
616	A new sink and faucet is needed in the lab as the present one is not level which results in water draining onto the floor.
616	Electrical outlets need to be replaced – Some are not working.
616	Need more bench space and storage space for lab supplies.

Lab #	Need/Issue
616B	Currently houses graduate students, but need to find other space for students so room can be recaptured as lab space for placement of HPLC and GC equipment.
621	Shelves/cabinet storage for lab supplies to free up lab bench space.
621	Need a larger (double) sink. Current sinks are too small for some cleaning tasks.
621	Electrical outlets – Some are not working.
621	Vacuum systems on lab benches would be very helpful.
816/818	Need functional walk-in freezer space for sample storage.
816/818	Repair of non-functional 110v benchtop outlets.
816/818	Repair of non-functional gas/air/vacuum valves on hoods.
816/818	Need additional floor or benchtop cabinet space for storage of lab supplies.
816/818	Repair non-functional floor drains in the lab.

Appendix HH

Major Research
Equipment in W.P.
Garrigus Building

Appendix HH – Major Research Equipment in W.P. Garrigus Building

Updated August 2017

Room	Item Description	Model Number
100	TSM 30 LB ELECTRIC SAUSAGE STUFFER	
105	THERMO SCI SPECTRONIC 200 SPECTROPHOTOMETER	
105	GAS CHROMATOGRAPH W/ACC, HP	G1800A
218	LARGE DODECA STAINER	457BR
218	FREEZER 17.2 CU.FT. UPRIGHT -86	ULT17865D3
218	PROTEAN PLUS DODECACELL W/ACC	
218	FISHER ISOTEMP LAB REFRIGERATOR	
218	FRENCH PRESS	FA078
218	FREEZER ULTRALOW 24.4 CU. FT. -86C	ULT2586-5-A40
218	REVCO ELITE PLUS -86C UPRIGHT FREEZER	ULT2586-6-A46
218	CONSOLE CONCENTRATOR	78120-00-D
218	PC DELL PRECISION WORKSTATION 350MT	PRECISION 350 MT
218	INCUBATOR HYBIRDAZATION SINGLE 120V	308
218	PC DELL P6300 GXAEM+/MT COMPUTER	MMP
218	MULTIBLOCK SYSTEM W/0.5ML BLOCK	
218	MULTIBLOCK SYSTEM W/0.5ML BLOCK	
218	MULTIBLOCK SYSTEM W/0.5ML BLOCK	
218	PC PENTIUM COMPUTER	
218	MINI-PROTEAN 3 DODECACELL W/ACC	
218	EPPENDORF MICROCENTRIFUGE 5415C	5415
218	KINEMATICA POLYTRON HOMOGENIZER	PCU11
218	OMNI MIXER HOMOGENIZER	17105
218	TECHNE HYBRIDIZATION OVEN	HB-1D
218	TRANS-BLOT PLUS, POWERPAC HP	1645052
218	LABLINE INSTRUMENTS INCUBATOR	120
218	DELL OPTIPLEX 7010 MINITOWER CORE I7-3770, 3.4GHZ	7010
220	THERMO SCIENTIFIC REVCO FREEZER UPRIGHT -86	
220	SHAKER WATERBATH DIGITAL W/ACC	C-76
220	KINEMATICA POLYTRON AGGREGATE PTA36/4	027-11-410-5
221	INCUBATOR 6 LM DIGITAL PRECISION	6LM
221	FLASH & GROW COLONY COUNTER SYSTEM	6010

Room	Item Description	Model Number
221	SYNERGY 4 HYBRID MULTIMODE MICROPLATE READER	U-54MLFPTAD
221	GRADIENT THERMAL CYCLER EPPENDORF	5331
221	INCUBATOR CO2 W/IR DETECTOR	51
221	O2/H2 GAS ANALYZER	10
221	BUCHI ROTAVAPOR R-215	R-215
221	CHARM LUMINATOR SYSTEM	400
221	SPECTROPHOTOMETER SPECTRONIC BIOMATE	BIOMATZ3
221	CABINET PURIFIER CLASS II SAFETY	36208-04
416	GLOMAX 20/20 LUMINOMETER SYSTEM W/ACC	E5311
416	WATER ACTIVITY MEASURING SYSTEM	25991
416	BIOCHEMICAL UV-VIS SYSTEM HP	U573000988
416	TEMPERATURE CONTROLLER PELTIER	89090A
416	BINARY PUMP W/CONT SEAL WASH HP 1100	1100
417	SHIMADZU UV-MINI 1240 SPECTROPHOTOMETER	UVMINI-1240
417	MALVERN CVO RHEOMETER	CVO-100-901
417	DSC CELL 2920 FOR RES W/ACC	991100-901
417	MODULATED DSC 2920 CELL BASE	915001-901
417	BARNSTEAD WATER PURIFICATION SYSTEM	D11911
417	PC W/18" MON DELL OPTIPLEX GX270T P4	OPTI GX270T P4
417	POLYTRON PT10/35 HOMOGENIZER	PT 10-35
418	SPECTROFLUOROMETER FLUOROMAX 3	FLMAX-3
418	NANO DEBEE 30 HIGH PRESSURE HOMOGENIZER	
418	MALVERN ZETASIZER NANO S90 PARTICLE SIZE ANALYZER	
418	FISHER ISOTEMP OVEN/INCUBATOR	725F
418	NEW BRUNSWICK SCIENTIFIC SHAKER	C10
418	FISHER WATER BATH	ISOTEMP 3013S
418	WATER BATH W/PLATFORM	G76NGBYRO
418	DILUTER DUAL SEP	MICROLAB50
418	DENSITOMETER LASER ULTRASCAN LKB DFH	
419	POLYTRON BENCHTOP HOMOGENIZER	PT10-35GT

Room	Item Description	Model Number
419	DIGITAL O2 CONTROLLER W/BUILT IN STIRRERS	DUAL DIGITALMODEL 20
419	PACK-VAC HAUG CA STANDARD	
419	OPTICAL BENCH UV SPECTROPHOTOMETER	UV-2401 PC
419	ANALYZER BRIDGE O2/CO2/CO	
419	REVCO FREEZER 24.4 CU. FT. -86C	ULT 2586-9-A40
419	LABSCAN XE SENSOR, VSI OPTION	XE
419	ISOTEMP + CHROMATOGRAPHY REFRIGERATOR	13-986-1368A
419	EZ TEST TEXTURE ANALYZER W/ACC	5 500N
419	PROTEAN IEF SYSTEM W/PROTEAN II XL CELL	PROTEAN IEF CEU
419	FREEZONE 6L SYSTEM FREEZE DRYER W/VACUUM PUMP	7753022
419	LABCONCO FREEZONE BULK TRAY DRYER	7806021
419	CENTRIFUGE REFRIGERATED DUPONT W-ACC	RC-5B
419	ROTOR SS-34 8 PLACE SORVALL	SS-34
419	FAT & MOISTURE ANALYZER	HFT2000
419	CHROMA METER MINOLTA	DP301
419	AMERSHAM FRACTION 920 COLLECTOR	FRAC-920
419	LABCONCO VACUUM PUMP	
419	BIO-RAD PROTEAN II XL MULTI-CELL	
420	PC GATEWAY SOLO 2500LS 333MHZ LAPTOP	MD2+
420	PC GATEWAY SOLO 2500 LS LAPTOP	SOLO 2500
420	PC DELL OPTIPLEX GX200 PIII 866MHZ	OPTI GX200 PIII
420	DELL OPTIPLEX 755 CORE 2 QAUD Q6600 PC	GX755
421	CAMERA SPOT SLIDER COLOR F/MICROSCOPE	RT SLIDER
421	CENTRIFUGE ROTOR FIBERLITE 12X50ML	
421	CENTRIFUGE ROTOR FIBERLITE 6X500ML	
421	COULTER COUNTER DUAL THRESHOLD	Z1
421	CENTRIFUGE REFRIGERATED	RC 5B
421	CENTRIFUGE REFRIGERATED W/ACC JOUAN	GR412
421	MICROPHOT FXA MAIN BODY	FXA

Room	Item Description	Model Number
421	DELL OPTIPLEX 755 CORE 2 QAUD Q6600 PC	GX755
421	PC P4 1.7GHZ WITH 19 INCH MONITOR	FRYER
421	PC DELL OPTIPLEX GX270MT P4 3.00GHZ	OPTI GX270MT P4
421	3D HD SPECAILIZED FOSSILS SCANNER	2020I
421	DIGITISER MICROSCRIBE GX2 50" SPHERE	
616	LABCONCO 4.5L BENCHTOP FREEZE DRY SYSTEM	7750020
616	IRIS-3 INFARED C-STABLE ISOTOPE ANALYZER	IRIS3
616	MERCURY ANALYZER W/AXX, NIC, MA-2, BC-1	MA-2000
616	DELL OPTIPLEX GX620 PD 830 3.00GHZ PC	OPTI GX620 PD 830
616	TURNABLE	2710
616	YSI SINGLE CHANNEL BIOCHEM ANALYZER	27005
616	GENESYS 10S UV-VIS SPECTROPHOTOMETER	G105UV-VIS
616	WATERS HPLC SYSTEM/ALLIANCE	2695
616	WATERS UV/VISIBLE DETECTOR W/SOFTWARE/ACC	WATERS 2489
616	SORVALL LEGEND REFRIGERATED MICROCENTRIFUGE	21R
616	MOLECULAR DEVICES MICROPLATE READER	VERSAMAX
616	REVCO 25 CU.FT. -86C UPRIGHT FREEZER	ULT2586-4-D46
616	MICROBALANCEC/34	C-34
616	WATER BATH	66799
616	VACCUM PUMP- FISHER MAXIMUM C-PLUS	
616	PC DELL INSPIRON 600M PM LAPTOP	INSPIRON 600M PM
618	ZEISS AXIO SCOPE A1 HAL50	A1 HAL50
618	CROSSHEAD METRIC INSTRON	0
618	PURIFICATION SYSTEM W/KIT	D4700
618	MICROPLATE WASHER AUTOMATED	EL404
618	INCUBATOR FORMA SINGLE CHAMBER CO2	3110
618	IEC HN-SII BENCHTOP CENTRIFUGE	hn-sii
618	THERMAL SCIENTIFIC SORVALL ST16TC 16/36 CENTRIFUGE	ST16

Room	Item Description	Model Number
618	SOLVENT EXTRACTOR	
618	SOLVENT EXTRACTOR	
618	DELL OPTIPLEX 755 CORE 2 QAUD Q6600 PC	
618	DELL OPTIPLEX 755 MINITOWER PC	
618	MICROWAVE ACCELERATED REACTION SYSTEM MARS6	
619	SANYO FREEZER UPRIGHT -86C W/RACK	ULTRALOW
619	CENTRIFUGE BECKMAN J6-MI FLOOR MODEL	J6-M1
619	CENTRIFUGE REFRIGERATED W-ROTOR DUPON	RC-3B
619	COBRA I5010	5010
619	LIQUID SCINTILLATION COUNTER TRI-CARB	
619	PC W/17" MON DELL OPTIPLEX GX270 SMT	OPTI GX270 SMT
619	RACK ROTOR ASSEMBLY BECKMAN JR-3.2	TY-JR32
621	DELL LATITUDE E6530 LAPTOP	E6530
621	EPPENDORF 5430R REFRIGERATED MICROCENTRIFUGE	5430R
621	FLUOROMETER	450
621	ULTRALOW FREEZER	VLT-659
621	EGG FORCE READER	
621	PARR ISOPERIBOL CALORIMETER	6200EA
621	DELL OPTIPLEX 780 DESKTOP	780
621	DELL OPTIPLEX 755 CORE 2 QAUD Q6600 PC	
621	US SCIENTIFIC 19.0 CF UPRIGHT ULTRA-LOW FREEZER	USDW-HL538
811	VET ULTRASOUND SCANNING SYSTEM	EN6061
811	MEIJI MICROSCOPE	
814	PORTABLE ULTRASOUND SYSTEM	DP2200VET
816	WIRELESS NON-INVASIVE TELEMETRY SYSTEM	TOE-R03
816	POWERLAB 8/30 & LABCHART PRO DATA ACQ. SYSTEM	ML870
816	DELL OPTIPLEX 990 DESKTOP	990
816	PRECISION SHAKING WATER BATH	25
816	NANOPURE-BIORESEARCH GRADE SYSTEM	D4751D4751

Room	Item Description	Model Number
816	CENTRIVAP ACID CONCENTRATION SYSTEM	78100-00
816	DELL OPTIPLEX 755 MINITOWER PC	
816	BASIC ASSEMBY PT 10/35 BRINKMAN	PT 10/35
816	PRECISION SHAKING WATER BATH	25
816	GEM 3000 BLOOD GAS ANALYZER	5700
816	SHIMADZU SPECTROPHOTOMETER W/SIPPER UNIT	UV-1800
818	CENTRIFUGE W/ACC LEGEND RT REFRIGERAT	LEGEND RT
818	PC W/17" MON GATEWAY E6100 P4 3GHZ	E6100
818	ANKOM GAS PRODUCTION SYSTEM	RFS
818	TECATOR DIGESTOR 2520	10014133
818	HYBAID DUAL INCUBATOR	HS9320
818	BECKMAN CENTRIFUGE GS-15R	365702
818	THELCO LAB OVEN	130D
818	OVEN, DOUBLE DOOR W/6 SHELVES	VWR1680
818	FURNACE 1.26CUFT 8 SEG 208V, FISHER	650-126
818	CONTROL MODULE 1 X 169+B100-01	AAIII
818	LABCONCO GLASSWARE DISHWASHER	LCF44204A
818	VACUUM OVEN, ISOTEMP ISO	ISOTEMP
818	VWR RECIPROCATING WATER BATH	
818	THERMO SCI. REVCO -86C ULTRALOW UPRIGHT FREEZER	
818	WATER BATH PRECISION SHAKING	50
0216C	4.5 CU. FT. HUMIDITY CONTROL CHAMBER W/BASE CAB	9140
0216C	SPRAY DRYER	BUCHI 190
0216C	COMPRESSION CELL 500 kg (Instron)	
0216C	CMPROESSION CELL 100 kg (Instron)	
0216C	COMPRESSION CELL 10 kg (Instron)	
0216C	COMPRESSION CELL 1 kg (Instron)	
0216C	CONTROL CONSOLE (Instron)	
0216C	HOBART ELECTRIC FOOD CUTTER W/ATTACHMENTS	
0216D	CABINET PURIFIER CLASS II SAFETY	36208-04
0216D	HOMOGENIZER / LABORATORY	HC5000
0216D	BALANCE / ANALYTICAL	AE200S
0216D	DELL OPTIPLEX 980 DESKTOP	980
0216E	ROTOR, BECKMAN	
0216E	ROTOR ASSEMBLY TYPE 45TI, BECKMAN	45TI

Room	Item Description	Model Number
0216E	CENTRIFUGE SORVAL SUPERSPEED REFRIG	RC5BPLUS
0216E	FREEZER ULTLOW 24.4 CU FT - 86C115V	
0216E	THERMO FORMA WATER JACKETED INCUBATOR	3110
0216E	ALUMINUM 32 PLACE MICRO ROTOR	F-20
0216E	BECKMAN COULTER TY-70TI ROTOR ASSEMBLY	
0216E	BECKMAN COULTER OPTIMA XPN -90 ULTRACENTRIFUGE	
0216E	ROTOR W/BUCKETS 4700 RPM SORVALL	SH 3000
0216E	ROTOR ALUMINUM MICROTUBE SORVALL	F-20
0216E	ROTOR SUPER-LITE FIXEDD ANGLE SORVALL	SLA 3000
0216E	ROTOR ALUMINUM FIXED ANGLE 17000 RPM	SA-600
0216E	LIQUID NITROGEN TANK K SERIES	SK
0218B	MC8.0, ULTRASOUND MICRO-CONVEX TRANSDUCER	
0218B	IBEX PRO 6.25 MHZ LINEAR ULTRASOUND SYSTEM	IBEX PRO
0218B	MASTERCYCLER THERMAL CYCLER	EPPENDORF MASTERCYCL
0218B	NAPCO 800WJ CO2 INCUBATOR	
0218B	LEICA TRINOCULAR MICROSCOPE W/CAMERA	
0218B	BIOSPECTRUM 410 IMAGING SYSTEM	
0218B	EPPENDORF REALPLEX 2 SYSTEM THERMAL CYCLER	
0218B	EPPENDORF 5424R KNOB REFRIG. CENTRIFUGE W/ROTOR	5424R
0218B	-86 UPRIGHT FREEZER	
0218B	CENTRIFUGE WITH ROTORS BECKMAN ALLEGR	21R
0218B	MICROSCOPE STEREO ZOOM	
0218B	CENTRIGUGE W/ROTOR EPPENDORF REFRIG	5415R
0218B	INCUBATOR VWR SHAKING	1575
0218B	SHAKING WATER BATH SMALL 120V	DB171615
0218B	BIOPHOTOMETER PLUS	
0218B	FIRSTLIGHT UV TRANSILLUMINATOR	
0218B	FREEZER ISOTEMP BASIC -86C 13 CU. FT.	

Room	Item Description	Model Number
0218B	LAPTOP PC FOR EPPENDORF MCEP REALPLEX 2 SSYSTEM	
0218B	DELL OPTIPLEX 755 DESKTOP	
0218B	PC DELL OPTIPLEX SX280 P4 3.4GHZ	
0218B	OLYMPUS STEREOZOOM MICROSCOPE	SZ6145TR
0218D	PROTEAN IEF SYSTEM	PROTEANIEF
0218D	PC SYSTEM VERSADOC 3000	3000
0218D	PWSC FLUOR. ENCL., PC DEMO	SPOTCUTTER
0218D	PC DELL OPTIPLEX GX270MT P4 2.60GHZ	OPTI GX270MT P4
0218D	PC DELL OPTIPLEX GX240SMT PA 1.8GHZ	DHM
0220A	CABINET, BIOLOGICAL SAFETY	1106
0220A	INCUBATOR FISHER CO2 SINGLE TC 115V	116885
0220A	ELECTROPORATOR ECM600	B8600
0221D	BIOMERIEUX PM I PERISTALTIC PUMP	
0221E	AUTOCLAVE AMSCO	
0221E	STEAM STILL	A1213
0221E	STERIZER SCIENTIFIC CENTURY 20X20X38	SG120
0221E	EASYPURE UF FISHER SCI	D7411
0221F	EDDY JET 2 AUTOMATIC PLATER FOR SPIRAL SPREADING	EDDY JET 2
0221F	DATAPAQ TRACKER SYSTEM	3506801
0221F	VITEK 2 COMPACT 30 CARD MICROBIAL ID SYSTEM W/BENC	
0221F	SEWARD STOMACHER CIRCULATOR	400C
0221F	PRECISION RECIPROCAL SHAKING BATH	50
0416B	SCANNING FLUORESCNCE DETECTOR W/ACC	474
0416B	DIODE-ARRAY DETECTOR W/FLOW CELL HP	1100
0616B	DELL OPTIPLEX 755 CORE 2 QAUD Q6600 PC	
0616B	DELL OPTIPLEX 755 MINITOWER PC	
0618A	DELL OPTIPLEX 780 CORE 2 DUO E8400 PC	78
0618A	PC DELL DIMENSION 4600 P4 2.80GHZ	4600
0618A	DELL OPTIPLEX 745 DESKTOP PC	OPTI 745
0618B	HOOD, WALK-IN W/LIGHTS	9682500227
0618B	ACCUMET XL60 PH/ISE/CON/DO KIT	35950-69
0621A	GAMMA COUNTER, COBRA	5005

Room	Item Description	Model Number
0816A	SPECTROPHOTOMETER, DOUBLE BEAM W/ACC	UV-160U
0816A	XTI PHOTOMETRIC ANALYZER KNOELAB 20	20XTI
0816B	PC W/MON GATEWAY E3200 400 PENT II	E3200
0816B	PERKIN ELMER ANALYST 200 SPECTROMETER	B3150070
0818A	PC DELL OPTIPLEX GX110 PIII 600MHZ	DCM
0818A	PC DELL DIMENSION 8200 P4 1.8GHZ	8200
0818A	PC GATEWAY M275XLB 14" 1.8GHZ LAPTOP	M275
0818A	PUMP GRADIENT SYSTEM	62000
0818A	GAS CHROMATOGRAPH HP 6890	G1530A
0818A	LIQUID CHROMATOGRAPH ALLIANCE	SM4
0818A	HPLC WATERS ALLIANCE SYSTEM	SM4
0818A	WATERS FRACTION COLLECTOR II	WFC
0818A	WATERS PHOTODIODE ARRAY DETECTOR	996
0818A	TRAY HP AUTOMATIC LIQUID TRAY	G2614A
0818A	INTEGRATOR HP 6890 SERIES	3396C
0818A	GAS CHROMATOGRAPH W/LIQUID SAMPLER	6850A
0818A	PC DELL INSPIRON 1150 P4 LAPTOP	PP08L
0818B	BALANCE, 210G ANALYTICAL, METTLER	AG204
0818B	SARTORIUS BALANCE ANALYTICAL	R160P
0818B	PC GATEWAY SOLO 9300 LS PIII LAPTOP	GWAY SOLO 9300 LS PI
0818C	FIBER ANALYZER ANKOM A200	ANKOM A200
0818C	FIBER ANALYZER	279
0818D	PC DELL OPTIPLEX GX1P/T+ PIII 500MHZ	MMP
0818D	VARIO MAX CN ELEMENTAL ANALYZER	VARIO MAX
0818D	CALORIMETER WITH OXYGEN BOMB	1281
0818D	PC GATEWAY SOLO 2500LS NOTEBOOK	SOLO2500
0821A	THERMO SCIENTIFIC CIRCULATING WATER BATH	270
0821A	EPPENDORF 5430R MICROCENTRIFUGE	5430R
0821A	BECKMAN INDUCTION DRIVE CENTRIFUGE	J2-21M
0821A	METTLER TOLEDO XSE204 ANALYTICAL BALANCE	
0821B	DELL LATITUDE E6500 LAPTOP PC	E6500
0821B	IBEX PRO ULTRASOUND & PROBES	

Room	Item Description	Model Number
0821C	TRANSONIC 400 FLOWMETER CONSOLE, 2-CH. W/ACC	TS4-02
0821C	GC CHEMSTATION PC W/19 INCH MONITOR	VL420DT
0821C	GAS CHROMATAGRAPH CHEMSTATION HP	D6721T
0821C	PC DELL OPTIPLEX GX100 CELERON 600MHZ	GX100
0821C	PC GATEWAY SOLO 9300 LS PIII LAPTOP	GWAY SOLO 9300 LS PI
0821C	PC GATEWAY SOLO 2500 LS LAPTOP	SOLO2500
0821C	AUTO ANALYZER II UPGRADE	SCIC
0821C	TITRATOR METTLER 00	DL67
0821C	ZEISS IM-35 INVERTED MICROSCOPE	377
0821C	INCUBATOR CO2 WATER JACKETED, FORMA	3193
0821C	BARNSTEAD NANOPURE WATER PURIFIER SYSTEM	D8991
B0006	LYNX HARSH ENVIRONMENT SCALE	LTHA-0000
B0010	OVEN DRYING 36X36X72 HOTPACK CORP	21430
B0010	CYCLOTEC MILL	10002016
B0010	SAMPLE MILL TECTOR CYCLOTEC	TC1093
B0010	CYCLOTEC SAMPLE MILL W/HOPPER	1093
B0010D	CUTTING MILL 115 VAC 60HZ	3383-L10
B0010H	LABCONCO BULK TRAY DRYER W/6 PORT MANIFOLD	7806041
B0010H	LABCONCO HYBRID VACUUM PUMP	RC6
B0010H	LABCONCO 18L FREEZE DRY SYSTEM	7755047
B0010I	WILEY MILL W/FLOOR STANDS	
B0013	SCOTSMAN MODULAR ICE MACHINE	
B0014	PRESSURE WASHER SYSTEM	
B0018	TRANSPORTABLE BASE FRAME W/WHEELS	
B0022B	TABLE / POWER-LIFT COJACK	
B0023	NORLAKE 33 CU. FT. FREEZER	
B0024	20.5 CU. FT. -86 CHEST FREEZER	ULT2090-3-A34
B0025	VACUUM PACKAGER MACHINE KOCH SUPPLIES	AG900
B0037	SCALE WITH DIGITAL READOUT PAUL	3074000
B0038	LELAND SOUTHWEST COW KNOCKING PEN	CUSTOM MADE
B0038	BEST & DONOVAN BAND SPLITTER SAW	150-SS
B0038	COMBO PIG SCALDER & DEHAIRER	JWE 25-190

Room	Item Description	Model Number
B0038	20 FT CHAIN HOIST	
B0041	VEMAG 500	V-500
B0041	SUPER PATTY MACHINE HOLYMATIC	54
B0041A	METTLER TOLEDO IMPACT-S INTEGRATED SCALES	
B0041A	HOBART SEMI-AUTOMATIC SLICER	3913
B0041A	TRUE REFRIGERATOR	TAC-48
B0041A	INJECTOR 16 NEEDLE SMART TECH	MH-16
B0045	ENVIRO-PAK FOOD PROCESSING OVEN	
B0049	CANNER W/THERMOMETER DIXIE RETORT 3	NB1013
B0049	TAYLOR FREEZER	733-27
B0049	KOCH ULTRA FILTRATION SYSTEM	
B0049	ROSS INPACK A10 TRAY SEALER	A10
B0049	LOUISVILLE WALK-IN COOLER	
B0049	LUNAIRE STEADY STATE 32 CU. FT. CHAMBER	CEO932-4
B0049	DUAL TEMP ISLAND-BLUE BUMPER COLOR	
B0049C	DELL OPTIPLEX 745 MINITOWER PC	OPTI 745 MINITOWER
B0049E	BBQ SMOKER WITH TRAILER	
B0049E	DISPLAY CASE REFRIGERATED DELI	RDG4848R
B0049E	TRUE FOOD OPEN MERCHANDISER	TAC 48
B0049E	TRUE FOOD OPEN MERCHANDISER	TAC 48
B0049E	BLACK REFRIGERATED SELF SERVE DISPLAY CASE	LPR554

Appendix II

Research Publications

APPENDIX II – Research Publications

Books and Book Chapters

Dwyer, R.M. Equine Zoonoses: Consequences of horse-human interactions. Chapter 25, pp. 643-657. IN: A. Sing, ed. *Zoonoses – Infections Affecting Humans and Animals: Focus on Public Health Aspects*. Springer Publishing, Dordrecht, Germany (2016).

Hennig, B., M.C. Petriello, B.J. Newsome, J.T. Perkins, and D. Liu. Chapter 3. Antioxidant therapy against environmental pollutants and associated diseases. Part 4: Nutritional antioxidant intervention against environmental pollution. In: *Nutritional Antioxidant Therapies: treatments and perspectives*. Springer-Verlag (Germany) 2016.

Jacob, J.P., and A.J. Pescatore. 2016. Assessing the sustainability of organic egg Production. Chapter 12. in 'Achieving sustainable cultivation of eggs Vol 2'. J. Roberts (ed.). Burleigh Dodds Science Publishing Limited. ISBN - print 978-1-78676-080-7

Baldwin, R.L., and K. R. Mcleod. 2014. Role and function of short chain fatty acids in rumen epithelial metabolism, development and importance of the rumen epithelium in understanding control of transcriptome. In: Congjun Li (Ed.) *Butyrate: Food Sources, Functions and Health Benefits*. New York, NY: Nova Science Publishers. pp. 119-218.

Hanson, D.J, Rentfrow, G., Schilling, M.W., and Mikel, W.B., Ripened meat products, U.S. products – Country Ham. 2014. *Handbook of Fermented Meat Products*, 2nd Ed. Wiley-Blackwell, Toldra, F. editor.

Pratt-Phillips, S., and L.M. Lawrence. 2014. Nutrition of the performance horse. In, *The Athletic Horse*, D. Hodgson, K. McKeever, eds. Elsevier Publishing. P35-55.

Silvia, W.J. 2014. Ruminant Phylogenetics: A Reproductive Biological Perspective. In *Reproduction in Domestic Ruminants VIII* (A. Miyamoto, M.F. Smith eds). Nottingham University Press, Nottingham, UK.

Silvia, W.J. 2013. *Domestic Animal Biology*. Kendall-Hunt Publishing Co., Dubuque, IA. ISBN 978-1-4652-2950-2 (second ed., 2013; revised 2014)

Suman, S.P., and P. Joseph. 2014. Chemical and physical characteristics of meat: Color and pigment. Chapter 84, Vol 3. pp. 244–251. IN: M. Dikeman and C. Devine, ed. *Encyclopedia of Meat Sciences*. Elsevier, Oxford, United Kingdom.

Suman, S.P., and P. Joseph. 2014. Proteomic technologies and their applications in the meat industry. Chapter 191, Vol 3. pp. 155–158. IN: M. Dikeman and C. Devine, ed. *Encyclopedia of Meat Sciences*. Elsevier, Oxford, United Kingdom.

Xiong, Y.L. 2014. Chemical and physical characteristics of meat: protein functionality. In *Encyclopedia of Meat Sciences*, 2nd ed., Dikeman, M. and Devine, C. (Eds.), pp. 267-273. Elsevier, Oxford, UK.

Lawrence, L. (2013). Feeding stallions and broodmares. In, *Equine Clinical and Applied Nutrition*, R. Geor and P. Harris, eds. Elsevier Publishing. Pp231-242.

Urschel, K.L. and Lawrence, L.M. Amino acids and protein (Chapter A-6). In: Equine Applied and Clinical Nutrition, 1st Edition (Editors R.J. Geor, P.A. Harris and M. Coenen). Saunders Elsevier, St. Louis MO, 2013, pages 113-135.

Jacob, J., and A. Pescatore. 2012. Gut health and organic acids, antimicrobial peptides and botanicals as natural feed additives. Organic Meat Production and Processing. S.C, Ricke, E.J. Van Loo, M.G. Johnson, and C.A. O'Bryan. Eds. Wiley-Blackwell. 351-378.

Jacob, J., and A. Pescatore. 2012. Prebiotics. Organic Meat Production and Processing. S.C, Ricke, E.J. Van Loo, M.G. Johnson, and C.A. O'Bryan. Eds. Wiley-Blackwell. 379-406.

Lawrence, L. 2012. Nutrition: Breeding Farm Management. In, Clinical Veterinary Advisor: The Horse. D.A. Wilson, Ed., Elsevier. St. Louis MO. P776-778.

Matthews, J. C., Y. Xue, S.F. Liao, E.D. Miles, and J.A. Boling. 2012. Alteration of Bovine Gene Expression and Protein Function by Ergot Alkaloids. In: C.A. Young, G.E. Aiken, R.L. McCulley, J.R. Strickland, and C.L. Schardl (eds.) Epichloae, Endophytes of Cool Season Grasses: Implications, Utilization and Biology. Chapter 1.5, pages 24-27. The Samuel Roberts Noble Foundation, Ardmore, OK.

Sollenberger, L.E., C.T. Agouridis, E.S. Vanzant, A.J. Franzluebbbers, and L.B. Owens. 2012. Prescribed grazing on pasturelands. Chap. 3. In C.J. Nelson (ed) Conservation Outcomes from Pastureland and Hayland Practices: Assessment, Recommendations and Knowledge Gaps. Allen Press, Lawrence KS.

Suman, S.P. 2012. Application of proteomics to understand meat quality. Chapter 14, pp 287–299. IN: Y.H. Hui, ed. Handbook of Meat and Meat Processing. CRC Press, Boca Raton, FL.

Lawrence, L.M. 2011. Nutritional management of the broodmare. Chpt 291 In, Equine Reproduction, A.O. McKinnon, E. Squires, eds., Blackwell Publishing, Hoboken, NJ. Pp2760-2768.

Suman, S.P. 2011. Modified atmosphere packaging of fresh red meats. Chapter 10, pp 203–212. IN: S. T. Joo, ed. Control of Meat Quality. Research Signpost, India.

Refereed Journal Articles

Baldwin, R.L., A.V. Capuco, C.M. Evock-Clover, P. Grossi, R.K. Choudhary, E.S. Vanzant, T.H. Elsasser, G. Bertoni, E. Trevisi, G.E. Aiken, and K.R. McLeod. 2016. Consumption of endophyte-infected fescue seed during the dry period does not decrease milk production in the following lactation. Journal of Dairy Science. 99(9), pp.7574-7589.

Borchers, M.R., Y.M. Chang, I.C. Tsai, B.A. Wadsworth, and J.M. Bewley. 2016. A validation of technologies monitoring dairy cow feeding, ruminating, and lying behaviors. Journal of Dairy Science. 99.7458-7466.

Bruno, K., E. Vanzant, K. Vanzant, and K. McLeod. 2016. Relationships of a novel objective chute score and exit velocity with growth performance of receiving cattle. Journal of Animal Science. 94: 4819-4831.

Camargo, F. Horse Species Symposium: Recent advances in the microbiome and physiology of the hindgut of the horse and dog, Journal of Animal Sciences 94(6):2245-6, June 2016.

- Canto, A.C.V.C.S, B.R.C. Costa-Lima, S.P. Suman, M.L.G. Monteiro, F.M. Viana, A.P.A.A. Salim, M.N. Nair, T.J.P. Silva, and C.A. Conte-Junior. 2016. Color attributes and oxidative stability of longissimus lumborum and psoas major muscles from Nellore bulls. *Meat Science*, 121: 19–26.
- Cao, Y., J. Zhao, and Y.L. Xiong. 2016. Coomassie Brilliant Blue-binding: a simple and effective method for the determination of water-insoluble protein surface hydrophobicity. *Analytical Methods* 8:790-795.
- Cao, Y., E.M. Xiong, A.D. True, and Y.L. Xiong. 2016. The pH-dependent protection of α -galactosidase activity by proteins against degradative enzymes during soymilk in vitro digestion. *LWT – Food Science and Technology* 8:790-795.
- Cao, Y., A.D. True, J. Chen, and Y.L. Xiong. 2016. The dual role (anti- and pro-oxidant) of gallic acid in mediating myofibrillar protein gelation and gel in vitro digestion. *Journal of Agricultural and Food Chemistry* 64:3054-3061.
- Catalano, D.N., R.J. Coleman, M.R. Hathaway, M.E. McCue, A.K. Rendahl, and K.L. Martinson. 2016. Estimation of actual and ideal bodyweight using morphometric measurements and owner guessed bodyweight of adult draft and warmblood horses. *Journal of Equine Veterinary Science*. 39: 38-43.
- Cerny, K.L., M. Rhoads, L.H. Anderson, W.R. Burris, J.C. Matthews, and P.J. Bridges. 2016. Form of supplemental selenium fed to cycling cows affects systemic concentrations of progesterone, but not estradiol. *Theriogenology*. 85:800-806.
- Cerny, K.L., R.A.C. Ribeiro, M. Jeoung, C. Ko, and P.J. Bridges. 2016. Estrogen receptor alpha (ESR1)-dependent regulation of the mouse oviductal transcriptome. *PLoS One*. 11(1):e0147685.
- Cerny, K.L., S. Garbacik, C. Skees, W.R. Burris, J.C. Matthews, and P.J. Bridges. 2016. Gestational form of selenium in free-choice mineral mixes affects transcriptome profiles of the neonatal calf testis, including those of steroidogenic and spermatogenic pathways. *Biological Trace Element Research*. 169:56-68.
- Chen, X., J. Li, T. Zhou, J. Li, J. Yang, W. Chen, and Y.L. Xiong. 2016. Two efficient nitrite-reducing *Lactobacillus* strains isolated from traditional fermented pork (Nanx Wudl) as competitive starter cultures for Chinese fermented dry sausage. *Meat Science* 121:302-309.
- Ciaramella, M.A., M.N. Nair, S.P. Suman, P.J. Allen, and M.W. Schilling. 2016. Differential abundance of muscle proteome in cultured channel catfish (*Ictalurus punctatus*) subjected to ante-mortem stressors and its impact on fillet quality. *Comparative Biochemistry and Physiology: Part D: Genomics and Proteomics*, 20: 10–18.
- Delles, R.M., Y.L. Xiong, A.D. True, T. Ao, and K.A. Dawson. 2016. Fiber type-dependent response of broiler muscles to dietary antioxidant supplementation for oxidative stability enhancement. *British Poultry Science* 57:751-762.
- Desai, M., V. Jackson, W. Zhai, S.P. Suman, M.N. Nair, C.M. Beach, and M.W. Schilling. 2016. Proteome basis of pale, soft, and exudative broiler breast (*Pectoralis major*) meat. *Poultry Science*, 95: 2696–2706.
- Dolecheck, K.A., W.J. Silvia, G. Heersche, Jr., C.L. Wood, K.J. McQuerry, and J.M. Bewley. 2016. A comparison of timed artificial insemination and automated activity monitoring with hormone intervention in three commercial dairy herds. *Journal of Dairy Science*. 99(2):1506-14.

- Dolecheck, K.A., G. Heersche, Jr., and J.M. Bewley. 2016. Retention pay-off based cost of days open regression equations: Application in a user-friendly decision support tool for investment analysis of automated estrus detection technologies. *Journal of Dairy Science*. 99(12):10182-10193
- Eckelkamp, E.A., J.L. Taraba, K.A. Akers, R.J. Harmon, and J.M. Bewley. 2016. Sand bedded freestall and compost bedded pack effects on cow hygiene, locomotion, and mastitis indicators. *Livestock Science*. 190:48-57.
- Eckelkamp, E.A., J.L. Taraba, K.A. Akers, R.J. Harmon, and J.M. Bewley. 2016. Understanding compost bedded pack barns: Interactions among environmental factors, bedding characteristics, and udder health. *Livestock Science*. 190:35-42.
- Hansen, T.L., A.L. Fowler, L.A. Strasinger, B.E. Harlow, S.H. Hayes, and L.M. Lawrence. 2016. Effect of soaking on nitrate concentrations in teff hay. *Journal of Equine Veterinary Science*. 45:53-57.
- Harlow, B.E., L. Lawrence, A. Crum, S. Hayes, and M.D. Flythe. 2016. Effect of dietary starch source and concentration on equine fecal microbiota. *PLoS One* DOI:10.1371/journal.pone.0154037 April 29, 2016.
- Jang, Y. D., P. Wilcock, R. D. Boyd, and M. D. Lindemann. 2016. Effect of xylanase supplementation of a phytase-supplemented diet on apparent total tract digestibility in pigs. *Journal of Animal Science* 2016.94:260–263. Published online before print doi:10.2527/jas2015-9789.
- Jiang, J., and Y.L. Xiong. 2016. Natural antioxidants as food and feed additives to promote health benefits and quality of meat products: A review. *Meat Science* 120:107-117.
- Klefot, J.M., J.L. Murphy, K.D. Donohue, B.F. O'Hara, M.E. Lhamon, and J.M. Bewley. 2016. Development of a noninvasive system for monitoring dairy cattle sleep. *Journal of Dairy Science* 99(10):8477-8485.
- Klotz, J.L., G.E. Aiken, J.R. Bussard, A.P. Foote, D.L. Harmon, B.M. Goff, F.N. Schrick and J.R. Strickland. 2016. Vasoactivity and vasoconstriction changes in cattle related to time off toxic endophyte-infected tall fescue. *Toxins*, 8(10), 271; doi: 10.3390/toxins8100271.
- Liang, D., L.M. Arnold, C.J. Stowe, R.J. Harmon, and J.M. Bewley. 2016. Estimating U.S. clinical dairy disease costs with a stochastic simulation model. *Journal of Dairy Science*.100 (2):1472-1486.
- Liu, D., J.T. Perkins, and B. Hennig. 2016. EGCG prevents PCB 126-induced endothelial cell inflammation via epigenetic modifications of NF- κ B target genes in human endothelial cells. *Journal of Nutritional Biochemistry*, 28: 164-170.
- Mastellar, S.L., A. Moffett, P.A. Harris, and K.L. Urschel. 2016. Effects of threonine supplementation on whole-body protein synthesis and plasma metabolites in growing and mature horses. *The Veterinary Journal*. 207: 147-153.
- Mastellar, S.L., T. Brewster-Barnes, K. Cybulak, and K.L. Urschel. 2016. Splanchnic extraction of phenylalanine in mature mares was not affected by threonine supplementation. *The Veterinary Journal*. 207: 190-192.

- Mastellar S.L., R.J. Coleman, and K.L. Urschel. 2016. Controlled trial of whole body protein synthesis and plasma amino acid concentrations in yearling horses fed graded amounts of lysine. *The Veterinary Journal*. 216: 93-100.
- Matthews, J.C., J. Huang, and G. Rentfrow. 2016. High-affinity Glutamate Transporter and Glutamine Synthetase Content in Longissimus Dorsi and Adipose Tissues of Growing Angus Steers Differs Among Suckling, Weanling, Backgrounding, and Finishing Production Stages. *Journal of Animal Science* 94:1267-75. doi: 10.2527/jas.2015-9901.
- Murphy, M.O., M.C. Petriello, S.G. Han, M. Sunkara, A.J. Morris, K. Esser, and B. Hennig. 2016. Exercise protects against PCB-induced inflammation and associated cardiovascular risk factors. *Environmental Science and Pollution Research International*, 23: 2201-2211.
- Mwangi, S., J. Timmons, T. Ao, M. Paul, L. Macalintal, A. Pescatore, A. Cantor, M. Ford, and K.A. Dawson. 2016. Effect of zinc imprinting and replacing inorganic zinc with organic zinc on early performance of broiler chicks. *Poultry Science* first published online September 23, 2016 doi:10.3382/ps/pew312
- Nair, M.N., S.P. Suman, M.K. Chatli, S. Li, P. Joseph, C.M. Beach, and G. Rentfrow. 2016. Proteome basis for intramuscular variation in color stability of beef semimembranosus. *Meat Science*, 113: 9–16.
- Neethling, N.E., S.P. Suman, G.O. Sigge, and L.C. Hoffman. 2016. Muscle-specific colour stability of blesbok (*Damaliscus pygargus phillipsi*) meat. *Meat Science*, 119: 69–79.
- Perkins, J.T., M.C. Petriello, B.J. Newsome, and B. Hennig. 2016. Polychlorinated biphenyls and links to cardiovascular disease. *Environmental Science and Pollution Research International*, 23:2160-2172.
- Petriello, M.C., J. Hoffman, M. Sunkara, B. Wahlang, J.T. Perkins, A.J. Morris, and B. Hennig. 2016. Dioxin-like pollutants increase hepatic flavin containing monooxygenase (FMO3) expression to promote synthesis of the pro-atherogenic nutrient biomarker Trimethylamine N-oxide from dietary precursors. *Journal of Nutritional Biochemistry*, 33: 145-153.
- Shelley, A., D. Lau, A.E. Stone, and J.M. Bewley. 2016. Short communication: Measuring feed volume and weight by machine vision. *Journal of Dairy Science*. 99(1):386-391.
- Shi, X., C. Li, M. Cao, X. Xu, G. Zhou, and Y.L. Xiong. 2016. Comparative proteomic analysis of longissimus dorsi muscle in immuno- and surgically castrated male pigs. *Food Chemistry*. 199:885-892.
- Stone, A.E., B.A. Wadsworth, J.D. Clark, and J.M. Bewley. 2017. Influence of breed, milk yield, and temperature humidity index on dairy cow lying time, neck activity, reticulorumen temperature, and rumination behavior. *Journal of Dairy Science*.100(3):2395-240.
- Suman, S.P., M.N. Nair, P. Joseph, and M.C. Hunt. 2016. Factors influencing internal color of cooked meats. *Meat Science*, 120: 133–144.
- Wadsworth, B.A., A.E. Stone, C.L. Wood, K.J. McQuerry, J.D. Clark, D.L. Ray, and J.M. Bewley. Characterization of milk yield, lying and rumination behavior locomotion and lesions between two different freestall bases. *Professional Animal Scientist*. 33 (1) 140-149

- Wahlang, B., M.C. Petriello, J.T. Perkin, S. Shen, and B. Hennig. 2016. Polychlorinated biphenyl exposure alters the expression profile of microRNAs associated with vascular diseases. *Toxicology In Vitro*, 35: 180-187, 2016.
- Wang, X., and Y.L. Xiong. 2016. Oxidative polyaldehyde production: a novel approach to the conjugation of dextran with soy peptides for improved emulsifying properties. *Journal of Food Science and Technology* 53:3215-3224.
- Wang, X., Y.L. Xiong, H. Sato, and Y. Kumazawa. 2016. Controlled cross-linking with glucose oxidase for the enhancement of gelling potential of pork myofibrillar protein. *Journal of Agricultural and Food Chemistry* 64:9523-9531.
- Wolfger, B. B.A. Wadsworth, K. Orsel, J.M. Bewley. 2016. Technical note: Evaluation of an ear-attached location monitoring system. *Journal of Dairy Science*.100(3):2219-2224.
- Zeng, H., J. Chen, J. Zhai, H. Wang, W. Xia, and Y.L. Xiong. 2016. Reduction of the fat content of battered and breaded fish balls during deep-fat frying using fermented bamboo shoot dietary fiber. *LWT – Food Science and Technology* 73:425-431.
- Zhang, W., J. Chen, Y. Chen, W. Xia, Y.L. Xiong, and H. Wang. 2016. Enhanced physicochemical properties of chitosan/whey protein isolate composite film by sodium laurate-modified TiO₂ nanoparticles. *Carbohydrate Polymers* 138:59-65.
- Zhao, J., W.L. Boatright. 2017. Static headspace analysis of odorants in commercial rice proteins, *Food Chemistry*. 221:345-350
- Zhu, Y., L. Ma, L., H. Yang, Y. Xiao, and Y.L. Xiong. 2016. Super-chilling (−0.7 °C) with high-CO₂ packaging inhibits biochemical changes of microbial origin in catfish (*Clarias gariepinus*) muscle during storage. *Food Chemistry* 206:182-190.
- Adeola, O., M.J. Azain, S.D. Carter, T.D. Crenshaw, M.J. Estienne, B.J. Kerr, M.D. Lindemann*, C.V. Maxwell, P.S. Miller, M.C. Shannon, and E. van Heugten. 2015. A cooperative study on the standardized total-tract digestible phosphorus requirement of twenty-kg pigs. *Journal of Animal Science* 93:5743-5753
Published online: doi:10.2527/jas2015-9509.
- Ao, T., L.M. Macalintal, M.A. Paul, A.J. Pescatore*, A.H. Cantor, M.J. Ford, B. Timmons, and K.A. Dawson. 2015. Effects of supplementing microalgae in laying hen diets on productive performance, fatty-acid profile, and oxidative stability of eggs. *Journal of Applied Poultry Research* 00:1–7. Published online: <http://dx.doi.org/10.3382/japr/pfv042>
- Boatright, W.L. 2016. Oxygen Dependency of One-Electron Reactions Generating Ascorbate Radicals and Hydrogen Peroxide from Ascorbic Acid, *Food Chemistry*. 196: 1361-1367. Published online: <http://dx.doi.org/10.1016/j.foodchem.2015.07.141>
- Boatright, W.L., A.D. Crum. 2016. Redox Cycling and Generation of Reactive Oxygen Species in Commercial Infant Formulas, *Food Chemistry* 196:189-195. Published online: <http://dx.doi.org/10.1016/j.foodchem.2015.08.130>
- Borchers, M.R., and J.M. Bewley*. 2015. An assessment of producer precision dairy farming technology use, prepurchase considerations, and usefulness. *Journal of Dairy Science* 98(6):4198-4205.

Brennan, K.M., E.E. Graugnard, M.L. Spry, T. Brewster-Barnes, C.A. Smith, R. Schaeffer, and K.L. Urschel*. Effects of a docosahexaenoic acid-rich algae supplement on insulin sensitivity after prolonged dexamethasone treatment in healthy, mature horses. *American Journal of Veterinary Research* 76: 889-896, 2015.

Burris, R. 2015. Techniques for reduction of shipping fever in beef cattle. *Chinese Journal of Animal Science* 2015.6

Canto, A.C.V.C.S., S.P. Suman*, M.N. Nair, S. Li, G. Rentfrow, C.M. Beach, T.J.P. Silva, T.L. Wheeler, S.D. Shackelford, A. Grayson, R.O. McKeith, and D.A. King. 2015. Differential abundance of sarcoplasmic proteome explains animal effect on beef *Longissimus lumborum* color stability. *Meat Science* 102: 90–98.

Canto, A.C.V.C.S., B.R.C. Costa Lima, S.P. Suman*, M.L.G. Monteiro, E.T. Marsico, C.A. Conte-Junior, R.M. Franco, A.P.A.A. Salim, R. Torrezan, and T.J.P. Silva. 2015. Fatty acid profile and bacteriological quality of caiman meat subjected to high hydrostatic pressure. *LWT – Food Science and Technology* 63: 872–877.

Cao, Y., and Y.L. Xiong*. 2015. Chlorogenic acid-mediated gel formation of oxidatively stressed myofibrillar protein. *Food Chemistry* 180:235-243.

Cerny, K.L., L. Anderson, W.R. Burris, M. Rhoads, J.C. Matthews, and P.J. Bridges*. 2015. Form of Supplemental Selenium Fed to Cycling Cows Affects Systemic Concentrations of Progesterone, but not Estradiol. *Theriogenology*. Published online: doi:10.1016/j.theriogenology.2015.10.022.

Cerny, K.L., S. Garbacik, C. Skees, W.R. Burris, J.C. Matthews, and P.J. Bridges*. 2015. Gestational Form of Selenium in Free-choice Mineral Mixes Affects Transcriptome Profiles of Neonatal Calf Testis, including those of Steroidogenic and Spermatogenic Pathways. *Biological Trace Element Research*. Published online: doi:10.1007/s12011-01500386-4.

Cerny, K.L., E. Garrett, A.J. Walton, L.H. Anderson, and P.J. Bridges*. 2015. A transcriptomal analysis of bovine oviductal epithelial cells during the follicular phase versus the luteal phase of the estrous cycle. *Reproductive Biology and Endocrinology*.13:84. Published online: DOI 10.1186/s12958-015-0077-1

Cerny, K.L., M. Van Fleet, A. Slepkin, E.M. Peterson, and P.J. Bridges*. 2015. Differential expression of mRNA encoding cytokines and chemokines in the reproductive tract after infection of mice with *Chlamydia trachomatis*. *Reproductive System & Sexual Disorders*. 4(3). Published online: doi:10.4172/2161-038X.1000152

Cetin-Karaca, H., and M.C. Newman*. 2015. Antimicrobial Efficacy of Plant Phenolic Compounds Against *Salmonella* And *Escherichia coli*. *Food Bioscience* (11) 1 Sept. pg 8-16 2015

Cetin-Karaca, H., and M.C. Newman*. 2015. Antimicrobial Efficacy of Natural Phenolic Compounds against Gram Positive Foodborne Pathogens. *Journal of Food Research* Vol 4, No 6 (2015)

Chanarat, S., S. Benjakul, and Y.L. Xiong*. 2015. Physicochemical changes of myosin and gelling properties of washed tilapia mince as influenced by oxidative stress and microbial transglutaminase. *Journal of Food Science and Technology* 52:3824-3836.

- Chen, Q., Q. Liu, Q. Sun, B. Kong, and Y.L. Xiong*. 2015. Flavour formation from hydrolysis of pork sarcoplasmic protein extract by a unique LAB culture isolated from Harbin dry sausage. *Meat Science* 100:110-117.
- Costa-Lima, B.R.C., S.P. Suman*, S. Li, C.M. Beach, T.J.P. Silva, E.T.F. Silveira, B.M. Bohrer, and D.D. Boler 2015. Dietary ractopamine influences sarcoplasmic proteome profile of pork *Longissimus thoracis*. *Meat Science* 103: 7–12.
- Delles, R.M., Y.L. Xiong*, A.D. True, T. Ao, and K.A. Dawson. 2015. Augmentation of water-holding and textural properties of breast meat from oxidatively stressed broilers through dietary antioxidant regimens. *British Journal of Poultry Science* 56:304-314.
- Dolecheck, K.A., W.J. Silvia, G. Heersche, Jr., Y.M. Chang, D.L. Ray, A.E. Stone, B.A. Wadsworth, and J.M. Bewley*. 2015. Behavioral and physiological changes around estrus events identified using multiple automated monitoring technologies. *Journal of Dairy Science* 98:8723–8731
- Fowler, A.L., T.L. Hansen, L.A. Strasinger, B.E. Harlow, and L.M. Lawrence*. 2015. Phosphorus digestibility and phytate degradation by yearlings and mature horses. *Journal of Animal Science* 93:5735-42
- Godoy, M.R.C., C.E. Conway, K.R. McLeod*, and D.L. Harmon. 2015. Influence of feeding a fish oil-containing diet to young, lean, adult dogs: effects on lipid metabolites, postprandial glycemia, and body weight. *Archives of Animal Nutrition* 69: 499-514. Published online: DOI:10.1080/1745039X.2015.1100866
- Guo, F., Y.L. Xiong*, F. Qin, H. Jian, X. Huang, and J. Chen. 2015. Surface properties of heat-induced soluble soy protein aggregates of different molecular masses. *Journal of Food Science* 80:C279-287.
- Guo, F., Y.L. Xiong*, F. Qin, H. Jian, X., Huang, and J. Chen. 2015. Examination of the causes of instability of soy protein isolate during storage through probing of the heat-induced aggregation. *Journal of American Oil Chemist Society* 92:1075-1084.
- Harlow, B.E., L.M. Lawrence*, and M.D. Flythe. 2015. Sample handling factors affecting the enumeration of lactobacilli and cellulolytic bacteria in equine feces. *Journal of Equine Veterinary Science* 35:744-748
- Holder, V.B., J.M. Tricarico, D.H. Kim, N.B. Kristensen, and D.L. Harmon*. 2015. The effects of degradable nitrogen level and slow release urea on nitrogen balance and urea kinetics in Holstein steers. *Animal Feed Science Technology* 200:57-65. Published online: [doi:10.1016/j.anifeedsci.2014.12.009](https://doi.org/10.1016/j.anifeedsci.2014.12.009)
- Huang, L., Q. Liu, X. Xia, B. Kong, and Y.L. Xiong*. 2015. Oxidative changes and the weakened gelling ability of salt-extracted protein are responsible for textural losses in dumpling meat fillers during frozen storage. *Food Chemistry* 185:459-469.
- Jackson, J.J., M.D. Lindemann, J.A. Boling, and J.C. Matthews*. 2015. Summer-long grazing of high versus low endophyte (*Neotyphodium coenophialum*)-infected tall fescue by growing beef steers results in distinct temporal blood analyte response patterns, with poor correlation to serum prolactin levels. *Frontiers in Veterinary Science* 2:77. Published online: doi: 10.3389/fvets.2015.00077.

- Jadeja, R., D. Jaroni, P. Vijayakumar* and S. Chintagari (2015). Application of monoclonal antibodies to develop rapid immunoassays for *Vibrio vulnificus*- A mini review. *AASCIT Journal of Biology* 2015; 1(4): 48-54.
- Jang, Y.D., J.Y. Ma, J.S. Monegue, H.J. Monegue, R.L. Stuart, and M.D. Lindemann*. 2015. Temporal plasma vitamin concentrations are altered by fat-soluble vitamin administration in suckling pigs. *Journal of Animal Science* 93:5273-5282. Published online: doi: 10.2527/jas2015-9221.
- Jia, Y., D.L. Harmon*, M.D. Flythe, and J.L. Klotz. 2015. Interaction of isoflavones and endophyte-infected tall fescue seed extract on vasoactivity of bovine mesenteric vasculature. *Frontiers* 2:1-10. Published online: doi: 10.3389/fnut.2015.00032
- Jiang, J., and Y.L. Xiong*. 2015. Technologies and mechanisms for safety control of ready-to-eat muscle foods: an updated review. *Critical Reviews in Food Science and Nutrition* 55:1886-1901.
- Jiang, J., and Y.L. Xiong*. 2015. Construction of interfacial protein membrane for oxidatively stable vegetable oil emulsions applicable to nutritionally modified sausage. *Meat Science* 109:56-65.
- Joseph, P., M.N. Nair, and S.P. Suman*. 2015. Application of proteomics to characterize and improve color and oxidative stability of muscle foods. *Food Research International* 76: 938–945.
- Kenney, N.M., E.S. Vanzant, D.L. Harmon, and K.R. McLeod*. 2015. Impact of direct-fed microbials on growth performance, carcass characteristics, ruminal fermentation, lactate utilization, and digestibility in steers fed a high concentrate diet. *Journal of Animal Science* 2015.93:2336–2348. Published online: doi:10.2527/jas2014-8570
- Kenney, N.M., E.S. Vanzant, D.L. Harmon, and K.R. McLeod*. 2015. Effect of direct-fed microbials on utilization of degradable intake protein in receiving steers. *Canadian Journal of Animal Science* 95:93-102. Published online: doi: 10.4141/cjas-2014-021.
- Kim, D.H., K.R. McLeod, A.F. Koontz, A.P. Foote, J.L. Klotz, and D.L. Harmon*. 2015. Effect of intake on fasting heat production, respiratory quotient and plasma metabolites measured using the washed rumen technique. *Animal* 9:58-66.
- Landrigan, P.J., R.O. Wright, J.F. Cordero, D.L. Eaton, B.D. Goldstein, B. Hennig*, R.M. Maier, D. Ozonoff, M.T. Smith, and R.H. Tukey. The NIEHS Superfund Research Program: Twenty-five years of translational research for public health. *Environmental Health Perspectives* 123: 909-918, 2015.
- Li, C., and Y.L. Xiong*. 2015. Disruption of secondary structure by oxidative stress alters the cross-linking pattern of myosin by microbial transglutaminase. *Meat Science* 108:97-105.
- Liao, S.F., J.A. Boling, and J.C. Matthews*. 2015. Gene Expression Profiling Indicates an Increased Capacity for Proline, Serine, and ATP Synthesis and Mitochondrial Mass, by the Liver of Steers Grazing High vs. Low Endophyte-infected Tall Fescue. *Journal of Animal Science* 93:5659-5671. Published online: doi:10.2527/jas2015-9193.
- Liu, C., and Y.L. Xiong*. 2015. Oxidation-initiated myosin subfragment cross-linking and structural instability differentiated between white and red muscle fiber types. *Journal of Food Science* 80:C288–C297.

- Liu, D., J.T. Perkins, M.C. Petriello, and B. Hennig*. 2015. Exposure to coplanar PCBs induces endothelial cell inflammation through epigenetic regulation of NF- κ B subunit p65. *Toxicology and Applied Pharmacology* 289: 457-465.
- Liu, Z., A.D. True, and Y.L. Xiong*. 2015. Curtailing oxidation-induced loss of myosin gelling potential by pyrophosphate through shielding the S1 subfragment. *Journal of Food Science* 80:C1468-1475.
- Mastro, L.M., A.A. Adams, and K.L. Urschel*. Pituitary pars intermedia dysfunction does not necessarily impair insulin sensitivity in old horses. *Domestic Animal Endocrinology* 50: 14-25, 2015.
- Miles, E.D., B.W. McBride, Y. Yang, S.F. Liao, J.A. Boling, P.J. Bridges, and J.C. Matthews*. 2015. Glutamine Synthetase (GS) and Alanine Transaminase Expression Are Decreased in Livers of Aged vs. Young Beef Cows and GS can be Up-regulated by 17 β -estradiol Implants. *Journal of Animal Science* 93:4500-4509. Published online: doi 10.2527/jas2015-9294.
- Nieto, G, Y.L. Xiong*, F. Payne, and M. Castillo. 2015. Light backscatter fiber optic sensor: a new tool for predicting the stability of pork emulsions containing antioxidative potato protein hydrolysate. *Meat Science* 100:262-268.
- Petty, L.A., G.L. Cromwell*, Y.D. Jang, and M.D. Lindemann. 2015. Estimation of calcium and phosphorus content in growing and finishing pigs: Whole empty body components and relative accretion rates. *Journal of Animal Science* 93:158-167. Published online: doi: 10.2527/jas2014-7602.
- Simeonov, M., D.L. Harmon*, and K. Nedelkov. 2015. Non-genetic factors affecting birth weight in the lambs of blackheads plevin breed. *Journal of Animal Science Advances* 5:1208-1217.
- Smith, J.L., E.S. Vanzant*, C.N. Carter, and C.B. Jackson. 2015. Discrimination of healthy versus sick steers by means of continuous remote monitoring of animal activity. *American Journal of Veterinary Research* 76(8), 739-744.
- Steele, M.A., C. Schiestel, O. AlZahal, L. Dionissopoulos, A.H. Laarman, J.C. Matthews*, and B.W. McBride. 2015. The Periparturient Period Is Associated with Structural and Transcriptomic Adaptations of Rumen Papillae in Dairy Cattle. *Journal of Dairy Science* 98:2583-2595. Published online: doi:10.3168/jds.2014-8640.
- Sun, W., and Y.L. Xiong*. 2015. Stabilization of cooked cured beef color by pea protein and its hydrolysate through antioxidative mechanism. *LWT-Food Science and Technology* 61:352-358.
- Wen, W, X. Luo, B. Xia, J. Guan, Y. Nie, L. Li, J. Duan, S.P. Suman*, and Q. Sun. 2015. Post-mortem oxidative stability of three yak (*Bos grunniens*) muscles as influenced by animal age. *Meat Science* 105: 121-125.
- Yang, F., C. Zhang, Q. Liu, C. Xu, and Y.L. Xiong*. 2015. Ca²⁺-selective electrode: A simple method to measure the phytase-aided release of bound calcium in soymilk. *Food Composition and Analysis* 39:43-47.
- Yang, F., Q. Liu, S. Pan, C. Xu, and Y.L. Xiong*. 2015. Chemical composition and quality traits of Chinese chestnuts (*Castanea mollissima*) produced in different ecological regions. *Food Bioscience* 2:33-42.

- Yang, J., and Y.L. Xiong*. 2015. Inhibition of lipid oxidation in O/W emulsions by interface-adsorbed myofibrillar protein: evidence of physical protection. *Journal of Agricultural and Food Chemistry* 63:8896-8904.
- Zhao, J., and Y.L. Xiong*. 2015. Interfacial peptide partitioning and undiminished antioxidative and emulsifying activity of oxidatively stressed soy protein hydrolysate in an O/W emulsion. *LWT-Food Science and Technology* 61:322-329.
- Abdi, D., M.S. Jahan, W.L. Boatright, B.M. Walters, and Q. Lei. Thermally-Stimulated Luminescence in Powdered Soy Proteins. *Journal of Food Science* 79(1):C25-31.
- Black, R.A., J.L. Taraba, G.B. Day, F.A. Damasceno, M.C. Newman, K.A. Akers, C.L. Wood, K.J. McQuerry, and J.M. Bewley. 2014. The relationship between compost bedded pack performance and management and bacterial concentrations. *Journal of Dairy Science* 97: 2669-2679.
- Brennan, K.M., and K.L. Urschel. Recovery of insulin sensitivity in mature horses after a three week course of dexamethasone therapy. *Equine Veterinary Journal* 46(6): 718-721, 2014.
- Burk, S.V., S. Dangoudoubiyam, T. Brewster-Barnes, U.K. Bryant, D.K. Howe, C.N. Carter, E.S. Vanzant, R.J. Harmon, K.R. Kazacos, and M.G. Rossano. In vitro culture of *Parascaris equorum* larvae and initial investigation of parasite excretory-secretory products. *Parasitology Research*. 2014. 113(11):4217-4224.
- Canto, A.C.V.C.S., B.R.C. Costa Lima, S.P. Suman, C.A. Lazaro, M.L.G. Monteiro, C.A. Conte-Junior, M.Q. Freitas, A.G. Cruz, E.B. Santos, and T.J.P. Silva. 2014. Physico-chemical and sensory attributes of low-sodium restructured caiman steaks containing microbial transglutaminase and salt replacers. *Meat Science* 96: 623–632.
- Chanarat, S., S. Benjakul, and Y.L. Xiong. 2014. Nonprotein nitrogenous compounds and gelling property of whitecheek shark (*carcharhinus dussumieri*) mince as affected by washing and microbial transglutaminase. *Journal of Texture Studies* 45:307-316.
- Cheng, Y., J. Chen, and Y.L. Xiong. 2014. Interfacial adsorption of peptides in oil-in-water emulsions co-stabilized by tween 20 and antioxidative potato peptides. *Journal of Agricultural and Food Chemistry* 62:11575-11581.
- Costa-Lima, B.R.C., A.C.V.C.S. Canto, S.P. Suman, C.A. Conte-Junior, E.T.F. Silveira, and T.J.P. Silva. 2014. Sex-specific effect of ractopamine on quality attributes of pork frankfurters. *Meat Science* 96: 799–805.
- Delles, R.M., and Y.L. Xiong. 2014. The effect of protein oxidation on hydration and water-binding in pork packaged in an oxygen-enriched atmosphere. *Meat Science* 97:181-188.
- Delles, R.M., Y.L. Xiong, A.D. True, T. Ao, and K.A. Dawson. 2014. Dietary antioxidant supplementation enhances lipid and protein oxidative stability of chicken broiler meat through promotion of antioxidant enzyme activity. *Poultry Science* 93:1561-1570.
- Desai, M.A., P. Joseph, S.P. Suman, J.L. Silva, T. Kim, and M.W. Schilling. 2014. Proteome basis of red color defect in channel catfish (*Ictalurus punctatus*) fillets. *LWT – Food Science and Technology* 57: 141–148.

- Dionissopoulos, L., O. AlZahal, M.A. Steele, J.C. Matthews, and B.W. McBride. 2014. Transcriptomic Changes in the Rumen of Peri-parturient Dairy Cows. *American Journal of Animal and Veterinary Sciences* 9:36-45.
- Egert, A.M., D.H. Kim, F.N. Schrick, D.L. Harmon, and J.L. Klotz. 2014. Dietary exposure to ergot alkaloids decreases contractility of bovine mesenteric vasculature. *Journal of Animal Science* 92:1768-1779.
- Egert, A.M., J.L. Klotz, K.R. McLeod and D.L. Harmon. 2014. Development of a methodology to measure the effect of ergot alkaloids on forestomach motility using real-time wireless telemetry. *Frontiers in Chemistry* 2:1-8. doi:10.3389/fchem.2014.00090.
- Eske, K., B. Newsome, S.G. Han, M. Murphy, D. Bhattacharyya, and B. Hennig. PCB 77 dechlorination products modulate proinflammatory events in vascular endothelial cells. *Environmental Science and Pollution Research International*. 21:6354-6364, 2014.
- Foote, A.P., G.B. Penner, M.E. Walpole, J.L. Klotz, K.R. Brown, L.P. Bush, and D.L. Harmon. 2014. Acute exposure to ergot alkaloids from endophyte-infected tall fescue does not alter absorptive or barrier function of the isolated bovine ruminal epithelium. *Animal* 8:1106-1112.
- Harlow, B.E., L.M. Lawrence, I.A. Kagan, I.A., M.D. Flythe. (2014). Inhibition of fructan-fermenting equine fecal bacteria and *Streptococcus bovis* by hops (*Humulus lupulus* L.) beta-acid. *Journal of Applied Microbiology* 117:329-339
- Hofe, C., L. Feng, A. Stromberg, B. Hennig, and L. Gaetke. Fruit and vegetable intake, as reflected by serum carotenoid concentrations, predicts reduced probability of PCB-associated risk for type 2 diabetes: NHANES 2003-2004. *Nutrition Research* 34: 285-293, 2014.
- Htoo, J., C. Zhu, L. Huber, C. de Lange, A. Quant, B. Kerr, G. Cromwell, and M. Lindemann. Determining the optimal isoleucine:lysine ratio for 10-22 kilogram and 24-39 kilogram pigs fed diets containing nonexcess levels of leucine. *Journal of Animal Science* 92:3482-3490.
- Jang, Y.D., M.D. Lindemann, J. Agudelo, C. Escobar, B. Kerr, N. Inocencio, and G. Cromwell. Comparison of direct and indirect estimates of apparent total tract digestibility with effort to reduce variation by pooling of multiple day fecal samples *Journal of Animal Science* 92:4566-4576.
- Jang, Y.D., M.D. Lindemann, H.J. Monegue, and R. Stuart. The effects of fat-soluble vitamin administration differ by oral administration or injection on plasma vitamin status of nursing pigs. *Asian-Australasian Journal of Animal Science* 27:674-682.
- Jang, Y., M. Lindemann, E. van Heugten, R. Jones, B. Kim, C. Maxwell, and J. Radcliffe. Effects of phytase supplementation on reproductive performance, apparent total tract digestibility of Ca and P and bone characteristics in gestating and lactating sows. *Revista Colombiana de Ciencias Pecuarias* 27:178-193.
- Jang, Y.D., Y.L. Ma, and M.D. Lindemann. Intrauterine position affects fetal weight and crown-rump length throughout gestation. *Journal of Animal Science* 92:4400-4406.
- Jian, H., Y.L. Xiong, F. Guo, X. Huang, B. Adhikari, and J. Chen. 2014. Gelation enhancement of soy protein isolate by sequential low and ultrahigh temperature two-stage preheating treatments. *International Journal of Food Science and Technology* 49:2529-2537.

- Jiang, J., B. Zhu, Y. Liu, and Y.L. Xiong. 2014. Interfacial structural role of pH-shifting processed pea protein in the oxidative stability of oil/water emulsions. *Journal of Agricultural and Food Chemistry* 62:1683-1691.
- Kenney, N.M., E.S. Vanzant, D.L. Harmon, and K.R. McLeod. 2014. Impact of direct-fed microbials on growth performance, carcass characteristics, ruminal fermentation, lactate utilization, and digestibility in steers fed a high concentrate diet. *Journal of Animal Science*. (Accepted).
- Kim, D.H., K.R. McLeod, A.F. Koontz, A.P. Foote, J.L. Klotz, and D.L. Harmon. 2014. Effect of intake on fasting heat production, respiratory quotient and plasma metabolites measured using the washed rumen technique. *Animal* 9:58-66.
- Kim, D. H., K.M. Mizinga, J.C. Kube, K.G. Friesen, K.R. McLeod, and D.L. Harmon. 2014. Influence of monensin and lauric acid distillate or palm oil on in vitro fermentation kinetics and metabolites produced using forage and high concentrate substrates. *Animal Feed Science Technology*. 189:19-29.
- Koontz, A.F., D.H. Kim, K.R. McLeod, J.L. Klotz, and D.L. Harmon. 2014. Effect of fescue toxicosis on whole body energy and nitrogen balance, in situ degradation and ruminal passage rates in Holstein steers. *Animal Production Science* <http://dx.doi.org/10.1071/AN14037>.
- Lawson, B.C., A.H. Shahzad, K.A. Dolecheck, E.L. Martel, K.A. Velek, D.L. Ray, J.C. Lawrence, and W.J. Silvia. 2014. A pregnancy detection assay using milk samples: Evaluation and considerations. *Journal of Dairy Science* 97:6316-6325.
- Ma, Y.L., M.D. Lindemann, J.L. Pierce, J.M. Unrine, and G.L. Cromwell. Effect of inorganic or organic selenium supplementation on reproductive performance and tissue trace mineral concentrations in gravid-first-parity gilts, fetuses, and nursing piglets. *Journal of Animal Science* 92:5541–5551.
- Mahan, D., M. Azain, T. Crenshaw, G. Cromwell, C. Dove, S. Kim, M. Lindemann, P. Miller, J. Pettigrew, H. Stein, and E. van Heugten. Supplementation of organic and inorganic selenium to diets using grain sources grown in various regions of the United States with differing natural Se concentrations and fed to grower-finisher swine. *Journal of Animal Science* 92:4991-4997.
- Mastro, L.M., K.L. Urschel, and A.A. Adams. Effects of pars pituitary intermedia dysfunction on whole-body protein synthesis and mTOR signaling in aged horses. *American Journal of Veterinary Research* 75(7): 658-667. 2014.
- Matthews, J.C., Z. Zhang, J.D. Patterson, P.J. Bridges, A.J. Stromberg, and J.A. Boling. 2014. Hepatic transcriptome profiles differ among maturing beef heifers supplemented with inorganic, organic, or mixed (50% Inorganic:50% Organic) forms of dietary selenium. *Biological Trace Element Research* 160:321-329.
- Matthews, J.C., and P.J. Bridges. 2014. NutriPhysioGenomics applications to identify adaptations of cattle to consumption of ergot alkaloids and inorganic versus organic forms of selenium: altered nutritional, physiological and health states? *Animal Production Science* 54:1594-1604.
- Miguel, G.Z., M.H. Faria, R.O. Roca, C.T. Santos, S.P. Suman, A.B.G. Faitarone, N.L.C. Delbem, L.V.C. Girao, J.M. Homem, E.K. Barbosa, L.S. Su, F.D. Resende, G.R. Siqueira, A.D. Moreira, and T.V. Savian. 2014. Immunocastration improves carcass traits and beef color attributes in Nellore and Nellore x Aberdeen Angus crossbred animals finished in feedlot. *Meat Science* 96: 884–891.

- Nair, M.N., S.P. Suman, S. Li, P. Joseph, and C.M. Beach. 2014. Lipid oxidation-induced oxidation in emu and ostrich myoglobins. *Meat Science* 96: 984–993.
- Nair, M.N., S.P. Suman, S. Li, R. Ramanathan, and R.A. Mancini. 2014. Temperature- and pH-dependent effect of lactate on in vitro redox stability of red meat myoglobins. *Meat Science* 96: 408–412.
- Nieto, G., Y.L. Xiong, F. Payne, and M. Castillo. 2014. Predicting frankfurter quality metrics using light backscatter. *Journal of Food Engineering* 143:132–138.
- Newsome, B., M. Petriello, S.G. Han, M.O. Murphy, K.E. Eske, M. Sunkara, A.J. Morris, and B. Hennig. Green tea diet decreases PCB 126-induced oxidative stress in mice by upregulating antioxidant enzymes. *Journal of Nutritional Biochemistry* 2: 126-135, 2014.
- Pesqueira, A., D.L. Harmon, A.F. Branco, and J.L. Klotz. 2014. Bovine lateral saphenous veins exposed to ergopeptine alkaloids do not relax. *Journal of Animal Science* 92:1213-1218.
- Petriello, M.C., S.G. Han, B.J. Newsome, and B. Hennig. PCB 126 toxicity is modulated by cross-talk between aveolae and Nrf2 signaling. *Toxicology and Applied Pharmacology* 277: 192-1999, 2014.
- Petriello, M.C., B. Newsome, and B. Hennig. Influence of nutrition in PCB-induced vascular inflammation. *Environmental Science and Pollution Research* 21:6410-6418, 2014.
- Petriello, M., B. Newsome, T.D. Dziubla, J.Z. Hilt, D. Bhattacharyya, and B. Hennig. Modulation of persistent organic pollutant toxicity through nutritional intervention: emerging opportunities in biomedicine and environmental remediation. *Science of the Total Environment* 491-492:11-16, 2014.
- Ramanathan, R., R.A. Mancini, S.P. Suman, and C.M. Beach. 2014. Covalent binding of 4-hydroxy-2-nonenal to lactate dehydrogenase decreases NADH formation and metmyoglobin reducing activity. *Journal of Agricultural and Food Chemistry* 62: 2112–2117.
- Smith, A.C., C.L. Wood, K.J. McQuerry, and J.M. Bewley. 2014. Effect of a tea tree oil and organic acid footbath solution on digital dermatitis in dairy cattle. *Journal of Dairy Science* 97: 2498-2501.
- Silvia, W.J., R.L. Peterson, J.A. Vucetich, W.F. Silvia, and A.W. Silvia. 2014. Variation in metatarsal morphology among subgroups of North American Moose (*Alces alces*). *Alces* 50:159-170.
- Silvia, W.J., C.H. Hamilton, and W.F. Silvia. 2014. A comparison of the occurrence of metatarsal splint bones in ruminants and their potential use in establishing phylogenetic relationships. *Zitteliana B* 32:1-8.
- Simeonov, M., N. Todorov, K. Nedelkov, A. Kirilov, and D.L. Harmon. 2014. Influence of live weight, sex and type of birth on growth and slaughter characteristics in early weaned lambs. *Small Ruminant Research* 121:188-192.
- Suman, S.P., G. Rentfrow, M.N. Nair, and P. Joseph. 2014. Proteomics of muscle- and species-specificity in meat color stability. *Journal of Animal Science* 92: 875–882.
- Suman, S.P., M.C. Hunt, M.N. Nair, and G. Rentfrow. 2014. Improving beef color stability: Practical strategies and underlying mechanisms. *Meat Science* 98: 490–504.
- Tanner, S.L., A.L. Wagner, R.N. Digianantonio, P.A. Harris, J.T. Sylvester, and K.L. Urschel. Dietary crude protein intake influences rates of whole-body protein synthesis in weanling horses. *Veterinary Journal* 202(2): 236-243.

- Urschel, K.L., J. Escobar, L.J. McCutcheon, and R.J. Geor. Effects of the rate of insulin infusion during euglycemic, hyperinsulinemic clamp procedures on measures of insulin action in healthy, mature Thoroughbred mares. *Domestic Animal Endocrinology* 47:92-100, 2014.
- Urschel, K.L., J. Escobar, L.J. McCutcheon, and R.J. Geor. Insulin infusion stimulates whole-body protein synthesis and activates the upstream and downstream effectors of mTOR signaling in the gluteus medius muscle of mature horses. *Domestic Animal Endocrinology* 47: 83-91, 2014.
- Zhang, X., Y.L. Xiong, J. Chen, and L. Zhou. 2014. Synergy of licorice extract and pea protein hydrolysate for oxidative stability of soybean oil-in-water emulsions. *Journal of Agricultural and Food Chemistry* 62:8204-8213.
- Adeola, O., D.C. Mahan, M.J. Azain, S.K. Baidoo, G.L. Cromwell, G.M. Hill, J.E. Pettigrew, C.V. Maxwell, and M.C. Shannon. 2013. Dietary lipid sources and levels for weanling pigs. *Journal of Animal Science* 91:4216-4225.
- Black, R.A., J.L. Taraba, G.B. Day, F.A. Damasceno, and J.M. Bewley. 2013. Compost bedded pack dairy barn management, performance, and producer satisfaction. *Journal of Dairy Science* 96: 8060-8074.
- Boatright, W.L., and M.S. Jahan. 2013. Effect of sequestering intrinsic iron on the electron paramagnetic resonance signals in powdered soy proteins. *Journal of Food Science*, 78(5):C660-666.
- Boatright, W.L. 2013. Hydrogen peroxide generation from hydrated protein drink mixes. *Journal of Food Science*, 78(11):C1651-1658.
- Brennan, K.M., R.S. Samuel, D.E. Graugnard, T. Ao, R. Xiao, A.H. Cantor, A.J. Pescatore. 2013. Organic Trace Mineral Levels in the First 96-H Post-Hatch Impact Growth Performance and Intestinal Gene Expression in Broiler Chicks. *Biological Trace Element Research*. 09/2013; DOI:10.1007/s12011-013-9813-6
- Brummer, M., and L. Lawrence 2013. Selenium status in horses. *Equine Disease Quarterly* 22(4):5-6
- Brummer, M., S. Hayes, A.A. Adams, D.W. Horohov, K.A. Dawson, and L.M. Lawrence. 2013. The effect of selenium supplementation on vaccination response and immune function in adult horses. *Journal of Animal Science* 91:3702-15.
- Brummer, M., S. Hayes, K.A. Dawson, and L.M. Lawrence. 2013. Measures of antioxidant status of the horse in response to selenium depletion and repletion. *Journal of Animal Science* 91:2158-2168
- Burk, S.V., M.G. Rossano, W.J. Silvia, E.S. Vanzant, A.J. Pescatore, and R.J. Harmon. 2013. Factors associated with course withdrawal and final course grade in an introductory animal science course. *NACTA Journal* 57.2 (Jun 2013): 16-23.
- Cappellozza, B.I., D.W. Bohnert, C.S. Schaeue, S.J. Falck, E.S. Vanzant, D L. Harmon, and R.F. Cooke. 2013. Daily and alternate day supplementation of urea or soybean meal to ruminants consuming low-quality cool-season forage: ii. Effects on ruminal fermentation. *Livestock Science* 155:214-222.
- Conway, C., M.R. Godoy, K.R. McLeod, and D.L. Harmon. 2013. The effects of graded arginine levels on nitrogen metabolism in the lean adult dog. *Journal Animal Science Advances* 3:1-12.
- Dionissopoulos, L., A.H. Laarman, O. AlZahal, S.L. Greenwood, M.A. Steele, J.C. Plazier, J.C. Matthews, and B.W. McBride. 2013. Butyrate-mediated genomic changes involved in non-specific host

defenses, matrix remodeling and the immune response in the rumen epithelium of cows afflicted with subacute ruminal acidosis. *American Journal of Animal and Veterinary Sciences* 8:8-27.

Earing, J.E., L.M. Lawrence, S.H. Hayes, M. Brummer, and E. Vanzant. 2013. Digestive capacity in weanling and mature horses. *Journal of Animal Science* 91:2151-2157

Eckelkamp, E.A., C.N. Gravatte, C.O. Coombs, and J.M. Bewley. 2013. Case Study: characterization of lying behavior in dairy cows transitioning from a freestall barn with pasture access to a compost bedded pack barn. *Professional Animal Scientist*. 30:109-113

Foote, A.P., N.B. Kristensen, J.L. Klotz, D.H. Kim, A.F. Koontz, K.R. McLeod, L.P. Bush, F.N. Schrick, and D.L. Harmon. 2013. Ergot alkaloids from endophyte-infected tall fescue decrease reticulorumen epithelial blood flow and volatile fatty acid absorption from the washed reticulorumen. *Journal of Animal Science* 91: 5366-5378.

Ghosh, D., J.M. Stencel, C.L. Hicks, F. Payne, and D. Ozevin. 2013. Acoustic Emission Signal of *Lactococcus lactis* before and after Inhibition with NaN₃ and Infections with Bacteriophage c2. *ISRN Microbiology* ID257313; <http://hindaw.com/isrn/microbiology/2013/257313/>

Gould, J.C., M.G. Rossano, L.M. Lawrence, S.V. Burk, R.B. Ennis, and E.T. Lyons. 2013. The effects of windrow composting on the viability of *Parascaris equorum* eggs. *Veterinary Parasitology*. 191(1-2):73-80.

Guo, X., and Y.L. Xiong. 2013. Characteristics and functional properties of buckwheat protein–sugar complexes prepared by controlled Maillard reaction. *LWT – Food Science and Technology* 51:397-404.

Halachmi, I., M. Klopčič, P. Polak, D.J. Roberts, and J.M. Bewley. 2013. Assessment of dairy cattle body condition score using thermal imaging. *Computers and Electronics in Agriculture*. 99: 35-40.

Han, S.G., B. Newsome, and B. Hennig. Titanium dioxide nanoparticles increase inflammatory responses in vascular endothelial cells. *Toxicology*, 306: 1-8, 2013.

Harlow, B.E., L.M. Lawrence, and M.D. Flythe. 2013. Diarrhea-associated pathogens, lactobacilli and cellulolytic bacteria in equine feces: Responses to antibiotic challenge. *Veterinary Microbiology*. 166:225-32;

Holder, V.B., S.W. El-Kadi, J.M. Tricarico, E.S. Vanzant, K.R. McLeod, and D.L. Harmon. 2013. The effects of crude protein concentration and slow release urea on nitrogen metabolism in Holstein steers. *Archives of Animal Nutrition*. 67:93-103.

Jacobs, B.M., J.F. Patience, M.D. Lindemann, K.J. Stalder, and B.J. Kerr. 2013. The use of a covariate reduces experimental error in nutrient digestion studies in growing pigs. *Journal of Animal Science* 91:804-810.

Jiang, J., and Y.L. Xiong. 2013. Extreme pH treatments enhance the structure-reinforcement role of soy protein isolate and its emulsions in pork myofibrillar protein gels in the presence of microbial transglutaminase. *Meat Science* 93:469-476.

Jiang, J., X. Zhang, A.D. True, L. Zhou, and Y.L. Xiong. 2013. Inhibition of lipid oxidation and rancidity in precooked pork patties by radical-scavenging licorice (*Glycyrrhiza glabra*) extract. *Journal of Food Science* 78:C1686-C1694.

Kim, D.H, K.R. McLeod, J.L. Klotz, A.F. Koontz, A.P. Foote, and D.L. Harmon. 2013. Evaluation of a rapid determination of fasting heat production and respiratory quotient in Holstein steers using the washed rumen technique. *Journal of Animal Science* 91: 4267-4276.

Koontz, A.F., D.H. Kim, A.P. Foote, L.P. Bush, J.L. Klotz, K.R. McLeod, and D.L. Harmon. 2013. Alteration of fasting heat production during fescue toxicosis in Holstein steers. *Journal Animal Science* 91:3881-3888.

Laarman, A.H., L. Dionissopoulos, O. AlZahal, M.A. Steele, S.L. Greenwood, J.C. Matthews, and B.W. McBride. 2013. Butyrate supplementation affects mRNA abundance of genes involved in glycolysis, oxidative phosphorylation and lipogenesis in the rumen of Holstein dairy cows. *American Journal of Animal and Veterinary Sciences* 8:239-245.

Lesiow, T., and Y.L. Xiong. 2013. A simple, reliable and reproductive method to obtain experimental pale, soft and exudative (PSE) pork. *Meat Science* 93:489-494.

Li, C., Y.L. Xiong, and J. Chen. 2013. Protein oxidation at different salt concentrations affects the cross-linking and gelation of pork myofibrillar protein catalyzed by microbial transglutaminase. *Journal of Food Science* 78:C823-831.

Liang, D., C.L. Wood, K.J. McQuerry, D.L Ray, J.D Clark, and J.M Bewley. 2013. Influence of breed, milk production, season, and ambient temperature on dairy cow reticulorumen temperature. *Journal of Dairy Science* 96: 5072-5081

Liu, Z., and Y.L. Xiong. 2013. Oxidation desensitizes actomyosin to magnesium pyrophosphate-induced dissociation. *Food Chemistry* 141:662-668.

Martin, S.K., D.L. Harmon, C.E. Conway, E.S. Vanzant, and K.R. McLeod. 2012. Influence of dietary histidine on basophil release, circulating concentration, and urinary excretion of histamine in domestic felines. *International Journal of Applied Research in Veterinary Medicine* 10:289-299. ***Not included in 2012***

Martin, S.K., D.L. Harmon, C.E. Conway, E.S. Vanzant, and K.R. McLeod. 2012. Dietary effects of magnesium on histamine metabolism and urine acidity in domestic felines. *American Journal of Animal and Veterinary Science* 7:186-193. ***Not included in 2012***

McDowell, K., E.S. Moore, A.G. Parks, L.P Bush, D. Horohov, and L.M. Lawrence. 2013. Vasoconstriction in horses caused by endophyte-infected tall fescue seed is detected with Doppler ultrasonography *Journal of Animal Science* 91: 1677-1684
Note that this paper will be included in papers for Dept Vet Sci (McDowell home dept)

Patterson, J.D., W.R. Burris, J.A. Boling, and J.C. Matthews. 2013. Individual intake of free-choice mineral mix by grazing beef cows may be less than typical formulation assumptions and form of selenium in mineral mix affects blood Se concentrations of cows and their suckling calves. *Biological Trace Mineral Research* 155:38-48.

Pivarnik, L.F., C. Faustman, S.P. Suman, C. Palmer, N.L. Richard, P.C. Ellis, and M. DiLiberti. 2013. Quality assessment of commercially processed carbon monoxide-treated tilapia fillets. *Journal of Food Science*, 78: S902–S910.

- Ramanathan, R., R.A. Mancini, P. Joseph, and S.P. Suman. 2013. Bovine mitochondrial oxygen consumption effects on oxymyoglobin in the presence of lactate as a substrate for respiration. *Meat Science*, 93: 893–897.
- Rashid, C.S., L.G. Carter, B. Hennig, and K.J. Pearson. Perinatal polychlorinated biphenyl 126 exposure alters offspring body composition. *Journal of Pediatric Biochemistry*, 3: 47-53, 2013.
- Rossano, M.G., and S.V. Burk. Factors Associated with Student Performance in an Equine Management Course. *NACTA Journal* 57.2 (Jun 2013): 11-15.
- Russell, R.A., and J.M. Bewley. 2013. Characterization of Kentucky dairy producer decision making behavior. *Journal of Dairy Science* 96: 4751-4758
- Smith, A.C., C.O. Coombs, and J.M. Bewley. 2013. Management practices employed by top Kentucky milk production herds. *Professional Animal Scientist* 29: 367-371.
- Smith, S.M., E.A. Chaney, and J.M. Bewley. 2013. Short Communication: Planning Considerations for On-Farm Dairy Processing Enterprises. *Journal of Dairy Science* 96: 4519-4522.
- Steele, M.A., O. AlZahal, S. Greenwood, J.C. Matthews, and B.W. McBride. 2013. Technical Note: Use of laser capture microdissection for the localization of tissue specific global gene expression in rumen papillae. *Journal of Dairy Science* 96:7748-7752.
- Sterrett, A.E., and J.M. Bewley. 2013. Characterization of management practices used by low somatic cell count Kentucky dairy herds. *Professional Animal Scientist* 29: 359-366.
- Sterrett, A.E., C.L. Wood, K.J. McQuerry, and J.M. Bewley. 2013. Changes in teat end hyperkeratosis after installation of an individual quarter pulsation milking system. *Journal of Dairy Science* 96: 4041-4046.
- Suman, S.P., and P. Joseph. 2013. Myoglobin chemistry and meat color. *Annual Review of Food Science and Technology*, 4: 79–99.
- Wagner, A.L., K.L. Urschel, A. Betancourt, A.A. Adams, and D.W. Horohov. The effects of old age on whole-body protein synthesis and skeletal muscle mTOR signaling in horses. *American Journal of Veterinary Research* 74(11) 1433-1442, 2013.
- Wagner, A.L., K.L. Urschel, M. Lefta, and K.A. Esser. Gluteus medius muscle sampling depth does not affect postprandial mTOR signaling in mature Thoroughbred mares. *American Journal of Veterinary Research* 74(6) 910-917, 2013.
- Wang, Y., Y.L. Xiong, G.R. Rentfrow, and M.C. Newman. 2013. Oxidation promotes cross-linking but impairs film-forming properties of whey proteins. *Journal of Food Engineering* 115:11-19.
- Zhao, J., Y.L. Xiong, and D.H. McNear. 2013. Changes in structural characteristics of antioxidative soy protein hydrolysates resulting from scavenging of hydroxyl radicals. *Journal of Food Science* 78:C152-159.
- Zhang, X., Y.L. Xiong, J. Chen, and L. Zhou. 2013. Synergistic inhibition of lipid oxidation by pea protein hydrolysate coupled with licorice extract in a liposomal model system. *Journal of Agriculture and Food Chemistry* 61:8452-8461.

Y. Xiong contributed to one article in Biosystems and Agricultural Engineering.

Álvarez, A., Y.L. Xiong, M. Castillo, F.A. Payne, and M.D. Garrido. 2012. Textural and viscoelastic properties of pork frankfurters containing canola–olive oils, rice bran, and walnut. *Meat Science* 92:8-15.

Boatright, W.L., Q. Lei, and M.S. Jahan. 2012. Effect of Moisture, Lipids and Select Amino Acid Blocking Agents on the Formation and Stability of Metastable Radicals in Powdered Soy Proteins. *Journal of Food Science* 77(6):C620-626.

Bohaty, R.E., M.R.C. de Godoy, K.R. McLeod, and D.L. Harmon. 2012. The effects of added sulfur amino acids, threonine, and an ideal amino acid ratio on nitrogen metabolism in mature, overweight dogs. *Archives of Animal Nutrition* 66:39-49.

Bridges, P.J., M. Jeoung, S. Shim, J. Park, J. Lee, L.A. Sapsford, K. Trudgen, C. Ko, M.C. Gye, and M. Jo. 2012. Hematopoietic prostaglandin D synthase: an ESR1-dependent oviductal epithelial cell synthase. *Endocrinology*. 153:1925-1935.

Brummer, M., S. Hayes, B.E. Harlow, L.A. Strasinger, K.A. Dawson, D.W. Horohov and L.M. Lawrence. 2012. Effect of selenium status on the response of unfit horses to exercise. *Comparative Exercise Physiology*. 8:203-212.

Che, T.M., O. Adeola, M.J. Azain, S.D. Carter, G.L. Cromwell, G.M. Hill, D.C. Mahan, P.S. Miller, and J.E. Pettigrew. 2012. Effect of dietary acids on growth performance of nursery pigs: A cooperative study. *Journal of Animal Science* 90:4408-4413.

Cui, X., Y.L. Xiong, B. Kong, X. Zhao, and N. Liu. 2012. Hydroxyl radical-stressed whey protein isolate: Chemical and structural properties. *Food and Bioprocess Technology* 5:2454-2461.

Dozier, III, W.A., G.L. Cromwell, and M.D. Lindemann. 2012. Effects of porcine somatotropin administration on the responses to dietary lysine and a near-ideal blend of amino acids for growing pigs. *Journal of Animal Science* 90:2663-2670.

Earing J.E., A. Durig, G.L. Gellin, L.M. Lawrence, and M.D. Flythe. 2012. Bacterial colonization of the equine gut; comparison of mare and foal pairs by PCR-DGGE. *Advances in Microbiology*. 2: 79-86 (<http://www.SciRP.org/journal/aim>).

Foote, A.P., D.L. Harmon, K.R. Brown, J.R. Strickland, K.R. McLeod, L.P. Bush, and J.L. Klotz. 2012. Constriction of bovine vasculature caused by endophyte-infected tall fescue seed extract is similar to pure ergovaline. *Journal of Animal Science* 90:1603-1609.

Han, S.G., S.S. Han, M. Toborek, and B. Hennig. 2012. EGCG protects endothelial cells against PCB 126-induced inflammation through inhibition of AhR and induction of Nrf2-regulated genes. *Toxicology and Applied Pharmacology* 261: 181-188.

Hennig, B., L. Ormsbee, C. McClain, B.A. Watkins, B. Blumberg, L. Bachas, W. Sanderson, C. Thompson, and W.A. Suk. 2012. Nutrition can modulate the toxicity of environmental pollutants: Implications in risk assessment and human health. *Environmental Health Perspectives* 120: 771-774.

Hong, G.P., and Y.L. Xiong. 2012. Microbial transglutaminase-induced structural changes and interaction of cationic and anionic myofibrillar proteins. *Meat Science* 91:36-42.

- Jia, N., Y.L. Xiong, B. Kong, Q. Liu, and X. Xia, X. 2012. Radical scavenging activity of black currant (*Ribes nigrum* L.) extract and its inhibitory effect on gastric cancer cell proliferation via induction of apoptosis. *Journal of Functional Foods* 4:382-390.
- Jiang, J., Y.L. Xiong, M.C. Newman, and G.K. Rentfrow. 2012. Structure-modifying alkaline and acidic pH-shifting processes promote film formation of soy proteins. *Food Chemistry* 132:1944-1950.
- Joseph, P., S.P. Suman, G. Rentfrow, S. Li, and C.M. Beach. 2012. Proteomics of muscle-specific beef color stability. *Journal of Agricultural and Food Chemistry*, 60: 3196–3203.
- Joseph, P., S.P. Suman, S. Li, M. Fontaine, and L. Steinke. 2012. Amino acid sequence of myoglobin from white-tailed deer (*Odocoileus virginianus*). *Meat Science*, 92: 160–163.
- Kasankala, L.M., Y.L. Xiong, and J. Chen. 2012. Enzymatic activity and flavor compound production in fermented silver carp fish paste inoculated with douchi starter culture. *Journal of Agricultural and Food Chemistry* 60:226-233.
- Klotz, J.L., K.R. Brown, Y. Xue, J.C. Matthews, J.A. Boling, W.R. Burris, L.P. Bush, and J.R. Strickland. 2012. Alterations in Serotonin Receptor-induced Contractility of Bovine Lateral Saphenous Vein in Cattle Grazing Endophyte-infected Tall Fescue. *Journal of Animal Science* 90:682-693.
- Ko, C., R. Meidan, and P.J. Bridges. 2012. Why two endothelins and two receptors for ovulation and luteal regression? *Life Sciences*. 91:501-506.
- Kong, B., X. Peng, Y.L. Xiong, and X. Zhao, X. 2012. Protection of lung fibroblast MRC-5 cells against hydrogen peroxide-induced oxidative damage by 0.1–2.8 kDa antioxidative peptides isolated from whey protein hydrolysate. *Food Chemistry* 135:540-545.
- Koontz, A.F., L.P. Bush, J. L. Klotz, K.R. McLeod, F.N. Schrick, and D.L. Harmon. 2012. Evaluation of a ruminally dosed tall fescue seed extract as a model for fescue toxicosis in steers. *Journal of Animal Science* 90:914-921.
- Li, C., Y.L. Xiong, and J. Chen. 2012. Oxidation-induced unfolding facilitates myosin cross-linking by microbial transglutaminase. *Journal of Agricultural and Food Chemistry* 60:8020-8027.
- Ma, Y.L., M.D. Lindemann, G.L. Cromwell, R. B. Cox, G. Rentfrow and J.L. Pierce. 2012. Evaluation of trace mineral source and pre-slaughter deletion of those minerals on performance, carcass characteristics, and pork quality in pigs. *Journal of Animal Science* 90:3833-3841.
- Martin, S.K., C.E. Conway, E.S. Vanzant, D.L. Harmon, and K.R. McLeod. 2012. Influence of dietary histidine on circulating concentration and urinary excretion of histamine in domestic felines. *International Journal of Applied Research in Veterinary Medicine* 10:289-299.
- Martin, S.K., C.E. Conway, E.S. Vanzant, D.L. Harmon, and K.R. McLeod. 2012. Dietary effects of magnesium on histamine metabolism and urine acidity in domestic felines. *American Journal of Animal and Veterinary Science* 7:186-193.
- McClelland, K.M., G. Rentfrow, G.L. Cromwell, M.D. Lindemann, and M.J. Azain. 2012. Effects of corn distillers dried grains with solubles on quality traits of pork. *Journal of Animal Science* 90:4148-4156.

- McCown, S., M. Brummer, S. Hayes, G. Olson, S.R. Smith, Jr., and L. Lawrence. 2012. Acceptability of teff hay by horses. *Journal of Equine Veterinary Science*. 32:327-331.
- Mirando, M.A., J.M. Bewley, J. Blue, D.M. Amaral-Phillips, V.A. Corriher, K.M. Whittet, N. Arthur, and D.J. Patterson. 2012. "EXTENSION EDUCATION SYMPOSIUM: Reinventing extension as a resource-What does the future hold?" *Journal of Animal Science* 90. 3677-3692.
- Quant, A.D., M.D. Lindemann, B.J. Kerr, R.L. Payne, and G.L. Cromwell. 2012. Standardized ileal digestible tryptophan to lysine ratios in growing pigs fed corn-based and non-corn-based diets. *Journal of Animal Science* 90:1270-1279.
- Ramanathan, R., R.A. Mancini, and S.P. Suman. 2012. Effects of 4-hydroxy-2-nonenal on beef heart mitochondrial ultrastructure, oxygen consumption, and metmyoglobin reduction. *Meat Science*, 90: 564–571.
- Ramanathan, R., R.A. Mancini, C.B. Van Buiten, S.P. Suman, and C.M. Beach. 2012. Effects of pyruvate on lipid oxidation and ground beef color. *Journal of Food Science*, 77: C886–C892.
- Rentfrow, G., R. Chaplin, and S.P. Suman. 2012. Technology of dry-cured ham production: Science enhancing art. *Animal Frontiers*, 2: 26–31.
- Scaletti, R.W., and R.J. Harmon. 2012. Effect of dietary copper source on response to coliform mastitis in dairy cows. *Journal of Dairy Science* 95: 654-662.
- Suman, S.P., P. Joseph, K.M. McClelland, S. Li, G. Rentfrow, Y.L. Xiong. 2012. Ginger extract improves tenderness of beef whole-muscle Biceps femoris. *Fleischwirtschaft International*. 27(2012):57-61.
- Tatijaborworntham, N., C. Faustman, S. Yin, R. Ramanathan, R.A. Mancini, S.P. Suman, C.M. Beach, N.B. Maheswarappa, E.W. Grunwald, and M.P. Richards. 2012. Redox instability and hemin loss of mutant sperm whale myoglobins induced by 4-hydroxy-nonenal in vitro. *Journal of Agricultural and Food Chemistry*, 60: 8473–8483.
- Taylor-Edwards, C.C., D.G. Burrin, N.B. Kristensen, J.J. Holst, K.R. McLeod, and D.L. Harmon. 2012. Glucagon-like peptide-2 (GLP-2) increases net amino acid utilization by the portal-drained viscera of ruminating calves. *Animal* 6:1985-1997 doi:10.1017/S175173111200095X.
- Urschel, K.L., R.J. Geor, M.D. Hanigan, and P.A. Harris. Amino acid kinetics in Arabian geldings: Effects of supplemental amino acids. *Journal of Nutrition* 142(3): 461-469, 2012.
- Wagner, A.L., and K.L. Urschel. Developmental regulation of the activation of translation initiation factors in response to feeding in the skeletal muscle of horses. *American Journal of Veterinary Research* 73(8) 1241-1251, 2012.
- Weems, Y.S., P.J. Bridges, M. Jeoung, J. Arreguin-Arevalo, T.M. Nett, R.C. Vann, S.P. Ford, A.W. Lewis, D.A. Neuendorff, T.A. Welsh, R.D. Randel, and C.W. Weems. 2012. In vivo intra-luteal implants of prostaglandin (PG) E₁ or E₂ (PGE₁, PGE₂) prevent luteolysis in cows. II. mRNA for PGF_{2α}, EP1, EP2, EP3(A-D), EP3A, EP3B, EP3C, EP3D, and EP4 prostanoid receptors in luteal tissue. *Prostaglandins and Other Lipid Mediators*. 97:60-65.

- Xiao, R., R.F. Power, D. Mallonee, K. Routt, L. Spangler, A.J. Pescatore, A.H. Cantor, T. Ao, J. L. Pierce, and K. A. Dawson. 2012. Effects of yeast cell wall-derived mannan-oligosaccharides on jejuna gene expression in young broiler chickens. *Poultry Science* 91: 1660-1669.
- Zhang, B., L. Chen, J.J. Choi, B. Hennig, and M. Toborek. 2012. Cerebrovascular toxicity of PCB153 is enhanced by binding to silica nanoparticles. *Journal of Neuroimmune Pharmacology* 7: 991-1001.
- Zhao, J., and Y.L. Xiong. 2012. Nitrite-cured color and phosphate-mediated water-binding of pork muscle proteins as affected by calcium in the curing solution. *Journal of Food Science* 77:C811-817.
- Zhao, J., J. Chen, H. Zhu, and Y.L. Xiong. 2012. Mass spectrometric evidence of malonaldehyde and 4-hydroxynonenal adductions to radical scavenging soy peptides. *Journal of Agricultural and Food Chemistry* 60:9727-9736.
- Zheng, Y., A. Morri, M. Sunkara, M. Toborek, and B. Hennig. 2012. EGCG stimulates Nrf2 and heme oxygenase-1 via caveolin-1 displacement. *Journal of Nutritional Biochemistry* 23: 163-168.
- Alvarez, D., R.M. Delles, Y.L. Xiong, M. Castillo, F.A. Payne, and J. Laencina. 2011. Influence of canola-olive oils, rice bran and walnut on functionality and emulsion stability of frankfurters. *LWT – Food Science and Technology* 44:1435-1442.
- Ao, T., J.L. Pierce, A.J. Pescatore, A.H. Cantor, K.A. Dawson, M.J. Ford, and M. Paul. 2011. Effects of feeding different concentrations and forms of zinc on the performance and tissue mineral status of broiler chicks. *British Poultry Science*. 52(4):466-471.
- Bohnert, D.W., T. DelCurto, A.A. Clark, M.L. Merrill, S.J. Falck, and D.L. Harmon. 2011. Protein supplementation of ruminants consuming low-quality cool- or warm-season forage: differences in intake and digestibility. *Journal of Animal Science*. 89:3707-3717.
- Brennan, K.M., C.A. Crowder, K. Horgan, J.L. Barger, R. Xiao, A.H. Cantor, R.F. Power, and K.A. Dawson. 2011. Effects of organic and inorganic dietary selenium supplementation on gene expression profiles in oviduct tissue from broiler-breeder hens. *Animal Reproduction Science*. doi:10.1016/j.anireprosci.2011.02.027.
- Brennan, K.M., W.R. Burris, J.A. Boling, and J.C. Matthews. 2011. Selenium content in blood fractions and liver of beef heifers is greater with a mix of inorganic/organic or organic versus inorganic supplemental selenium forms but the time required for maximal assimilation is tissue-specific. *Biological Trace Mineral Research*. 144:504-516.
- Cromwell, G.L., M.J. Azain, O. Adeola, S.K. Baidoo, S.D. Carter, T.D. Crenshaw, S.W. Kim, D.C. Mahan, P.S. Miller, and M.C. Shannon. North Central Coordinating Committee on Swine Nutrition. 2011. Corn distillers dried grains with solubles in diets for growing-finishing pigs: A cooperative study. *Journal of Animal Science* 89:2801-2811.
- Delles, R.M., Y.L. Xiong, and A.D. True. 2011. Mild protein oxidation enhanced hydration and myofibril swelling capacity of fresh ground pork muscle packaged in high-oxygen atmospheres. *Journal of Food Science* 76:C760-C767.
- Foot, A.P., D.L. Harmon, J.R. Strickland, L.P. Bush, and J.L. Klotz. 2011. Effect of ergot alkaloids on contractility of bovine right ruminal artery and vein. *Journal of Animal Science*. 89:2944-2949.

- Herman, R.A., C.M. Dunville, D.R. Juberg, D.W. Fletcher, and G.L. Cromwell. 2011. Performance of broiler chickens fed event DAS-40278-9 maize containing the aryloxyalkanoate dioxygenase-1 protein. *Regulatory Toxicology and Pharmacology*, doi:10.1016/j.yrtph.2011.04.004.
- Herman, R.A., C.M. Dunville, D.R. Juberg, D.W. Fletcher, and G.L. Cromwell. 2011. Performance of broiler chickens fed diets containing DAS-68416-4 soybean meal. *GM Crops* 2:3:169-175.
- Huang, W., I.E. András, G.B. Rha, B. Hennig, and M. Toborek. 2011. PPAR α and PPAR γ protect against HIV-1-induced MMP-9 overexpression via caveolae-associated ERK and Akt signaling. *FASEB Journal*, 25: 3979-3988.
- Jiang J., Xiong Y.L., and Chen J. 2011. Role of β -conglycinin and glycinin subunits in the pH-shifting-induced structural and physicochemical changes of soy protein isolate. *Journal of Food Science* 76:C293-302.
- Jin, H.G., Y.L. Xiong, Z.Q. Peng, Y. He, Z.Z. Sun, and G.H. Zhou. 2011. Purification and characterization of myosin-tripolyphosphatase from rabbit psoas major muscle. *Meat Science* 89:372-376.
- Joseph, P., S.P. Suman, S. Li, J.R. Claus, M. Fontaine, and L. Steinke. 2011. Primary structure of turkey myoglobin. *Food Chemistry*, 129: 175–178.
- Kasankala, L.M., Y.L. Xiong, and J. Chen. 2011. The influence of douchi start cultures on the composition of extractive components, microbiological activity, and sensory properties of fermented fish pastes. *Journal of Food Science* 76: C154-161.
- Layne, J., Z. Majkova, M. Toborek, and B. Hennig. 2011. Emerging Issues: Caveolae: a regulatory platform for nutritional modulation of inflammatory diseases. *Journal of Nutritional Biochemistry*, 22: 807-811.
- Lehner, C., R. Gehwolf, H. Tempfer, I. Krizbai, B. Hennig, H.C. Bauer, and H. Bauer. 2011. Oxidative stress and blood-brain barrier dysfunction under particular consideration of matrix metalloproteinases. *Antioxidants & Redox Signaling*, 15: 1305-1323.
- Liao, S.F., J.S. Monegue, M.D. Lindemann, G.L. Cromwell, and J.C. Matthews. 2011. Dietary supplementation of boron differentially alters expression of borate transporter (NaBC1) mRNA by jejunum and kidney of growing pigs. *Biology of Trace Element Research* 143:901–912.
- Liebold, C.M., Q. Lei, W.L. Boatright, and M.S. Jahan. 2011. Metastable Radicals & Intrinsic Chemiluminescence from Soy Proteins, *Journal of Food Science*, 76(7):C1101-1107.
- Liu, C., Y.L. Xiong, and G.K. Rentfrow. 2011. Kiwifruit protease extract injection reduces toughness of pork loin muscle induced by freeze–thaw abuse. *LWT – Food Science and Technology* 44:2026-2031.
- Liu, Z., Y.L. Xiong, and J. Chen. 2011. Morphological examinations of oxidatively stressed pork muscle and myofibrils upon salt marination and cooking to elucidate the water-binding potential. *Journal of Agricultural and Food Chemistry* 59:13026-13034.
- Ma, L., and Y.L. Xiong. 2011. Textural attributes and oxidative stability of pork longissimus muscle injected with marbling-like emulsified lipids. *Meat Science* 89:209-216.

- Majkova, Z., J. Layne, M. Sunkara, A.J. Morris, M. Toborek, and B. Hennig. 2011. Omega-3 fatty acid oxidation products prevent vascular endothelial cell activation by coplanar polychlorinated biphenyls. *Toxicology of Applied Pharmacology*. 251(1): 41-49.
- Mancini, R.A., R. Ramanathan, S.P. Suman, G. Dady, and P. Joseph. 2011. Effects of succinate on raw and cooked ground beef color. *Meat Science*, 89: 189–194.
- McCown, S., M. Brummer, S. Hayes, G. Olson, S. R. Smith, Jr., L. Lawrence. 2011. Acceptability of teff hay by horses. *Journal of Equine Veterinary Science*. Published on-line: doi:10.1016/j.jevs.2011.11.008
- Miles, E.D., Y. Xue, J.R. Strickland, J.A. Boling, and J.C. Matthews. 2011. Ergopeptines bromocriptine and ergovaline, and domperidone, inhibit bovine equilibrative nucleoside transporter 1-like activity. *Journal of Agriculture and Food Chemistry*. 59:9691-9699.
- Oakley, O., P. Lin, P. Bridges, and C. Ko. 2011. Animal models for the study of polycystic ovarian syndrome. *Endocrinology and Metabolism*. 26:193-202.
- Petersen, G.I., C. Pedersen, M.D. Lindemann, and H.H. Stein. 2011. Relative bioavailability of phosphorus in inorganic phosphorus sources fed to growing pigs. *Journal of Animal Science* 89:460–466.
- Pivarnik, L.F., C. Faustman, S. Rossi, S.P. Suman, C. Palmer, N.L. Richard, P.C. Ellis, and M. DiLiberti. 2011. Quality assessment of filtered smoked yellowfin tuna (*Thunnus albacares*) steaks. *Journal of Food Science*, 76: S369–S379.
- Quant, A.D., M.D. Lindemann, B.J. Kerr, R.L. Payne, and G.L. Cromwell. 2011. Standardized ileal digestible tryptophan to lysine ratios in growing pigs fed corn-based and non-corn-based diets. *Journal of Animal Science*. Published online: doi:10.2527/jas.2011-4537.
- Reames, P.S., T.B. Hatler, S.H. Hayes, D.L. Ray, and W.J. Silvia. 2011. Differential regulation of estrous behavior and luteinizing hormone secretion by estradiol-17 β in ovariectomized dairy cows. *Theriogenology* 75:233-240.
- Reeder, T., G. Hibbard, K.R. McLeod, and D.L. Harmon. 2011. Dietary lysine: calorie ratios and their influence on nitrogen metabolism and digestibility in moderately obese mature dogs. *American Journal of Animal and Veterinary Science*. 6: 45-54.
- Russell, R.A., and J.M. Bewley. 2011. Producer assessment of dairy extension programming in Kentucky. *Journal of Dairy Science*. 94: 2637-2647.
- Scaletti, R.W., and R.J. Harmon. 2011. Effect of dietary copper source on response to coliform mastitis in dairy cows. *Journal of Dairy Science*. Published online: doi: 10.3168/jds.2011-4435.
- Silvia, W.J., R.O. Peterson, W.F. Silvia, J.A. Vucetich and A.W. Silvia. 2011. The occurrence and morphology of a lateral metatarsal splint bone in moose (*Alces alces*). *The Anatomical Record* 294:231-235.
- Sollenberger, L.E., and E.S. Vanzant. 2011. Interrelationships among forage nutritive value and quantity and individual animal performance. *Crop Science* 51:420-432.

- Steele, M., G. Vandervoort, O. AlZahal, S. Hook, J.C. Matthews, and B.W. McBride. 2011. Rumen epithelial adaptation to high grain diets involves the coordinated regulation of genes involved in cholesterol homeostasis. *Physiological Genomics*. 43:308-316.
- Stein, H.H., O. Adelo, G.L. Cromwell, S.W. Kim, D.C. Mahan, and P.S. Miller. 2011. Concentration of dietary calcium supplied by calcium carbonate does not affect the apparent total tract digestibility of calcium, but decreases digestibility of phosphorus digestibility by growing pigs. *Journal of Animal Science* 89:2139-2144.
- Strickland, J.R., M.L. Looper, J.C. Matthews, C.F. Rosenkrans, M.D. Flythe, and K.R. Brown. 2011. BOARD-INVITED REVIEW: St. Anthony's fire in livestock: causes, mechanisms and potential solutions. *Journal of Animal Science*. 89:1603-1626.
- Suman, S.P., R.A. Mancini, P. Joseph, R. Ramanathan, M.K.R. Konda, G. Dady, and S. Yin. 2011. Chitosan inhibits premature browning in ground beef patties. *Meat Science*, 88: 512–516.
- Taylor-Edwards, C.C., D.G. Burrin, K.R. McLeod, J.J. Holst, and D.L. Harmon. 2011. Glucagon-like peptide-2 (GLP-2) increases small intestinal blood flow and mucosal growth in ruminating calves. *Journal of Dairy Science*. 94:888-898.
- Urschel, K.L., J. Escobar, L.J. McCutcheon, and R.J. Geor. 2011. Feeding a high protein diet following an 18-hour period of feed withholding increases mTOR-dependent signaling in skeletal muscle of mature horses. *American Journal of Veterinary Research* 72(2): 248-255.
- Wu, M.G., Xiong, Y.L., and Chen, J. 2011. Rheology and microstructure of myofibrillar protein–lipid composite gels: effect of emulsion droplet size and membrane type. *Journal of Food Engineering* 106:318-324.
- Wu, M.G., Y.L. Xiong, and J. Chen. 2011. Role of disulphide linkages between protein-coated lipid droplets and the protein matrix in the rheological properties of porcine myofibrillar protein–peanut oil emulsion composite gels. *Meat Science* 88:384-390.
- Xiao, R., R.F. Power, D. Mallonee, C. Crowder, K.M. Brennan, T. Ao, J.L. Pierce and K.A. Dawson. 2011. A comparative transcriptomic study of vitamin E and EconomasETM as antioxidative agents: Investigation of replacing vitamin E with EconomasE in broiler diets. *Poultry Science*. 90:136-146.
- Xue, Y., J.R. Strickland, J.A. Boling, J.C. Matthews. 2011. Bovine vesicular glutamate transporter activity is inhibited by ergovaline and other ergopeptides. *Journal of Dairy Science*. 94:3331 - 3341.
- Yin, S., C. Faustman, N. Tatiyaborworntham, B.M. Naveena, R.A. Mancini, R. Ramanathan, P. Joseph, S.P. Suman, and Q. Sun. 2011. Species-specific myoglobin oxidation. *Journal of Agricultural and Food Chemistry*, 59: 12198–12203.

Other Research Publications (Nonrefereed)

- Adedokun, S.A. 2016. Performance, productivity, and dietary amino acid in poultry. Presented at the Multi-State Poultry Feeding and Nutrition conference, Indianapolis.
- Ao, T., L. M. Macalintal, M. A. Paul, P. Glenney, A.J. Pescatore, A.H. Cantor, M.J. Ford and K. A. Dawson. 2016. The use of microalgae in layer diet in 70 wk production: impacts on egg docosahexaenoic

acid concentration, yolk color and production performance of laying hens. In: International Egg Symposium, Alberta, Canada.

Ao, T. L. Macalintal, M. Paul, P. Glenney, A.J. Pescatore, A.H. Cantor, M.J. Ford and Karl A. Dawson. 2016. Long term effects of dietary microalgae on productive performance of laying hens and egg docosahexaenoic acid concentration. In: Proceedings of the XXV World Poultry Congress, Beijing, China.

Dwyer, R.M. (October 2016) The Importance of Cleaning to Disinfection. Lloyd's Equine Disease Quarterly.

Dwyer, R.M. (January 2016) Commentary. Lloyd's Equine Disease Quarterly.

Dwyer, R.M. (May 2016) Foal Diarrhea (article updated). American Association of Equine Practitioners publication 794: <http://www.aaep.org/info/horse-health?publication=794>

Dwyer, R.M. (February 2016) When should I call the vet? (article updated) American Association of Equine Practitioners publication 952: <http://www.aaep.org/info/horse-health?publication=952>.

Nair, M.N., B.R. Costa-Lima, M.W. Schilling, D.D. Boler, and S.P. Suman. Proteomics of biomolecular interactions in post-mortem skeletal muscles. pp 1–4. In proceedings of American Meat Science Association Annual Reciprocal Meat Conference, June 2016, San Angelo, TX, USA.

Rentfrow, G., J. McNeil, and M. Newman. 2016. Fundamentals of dry curing. Meatingplace Magazine, Published online; <http://www.meatingplace.com/Industry/TechnicalArticles/Details/60420?allowguest=true>

Rentfrow, G. 2016. Ground beef's place in the local food movement. Meatingplace Magazine, Published online; <http://www.meatingplace.com/Industry/TechnicalArticles/Details/60430?allowguest=true>

Suman, S.P., and M.N. Nair 2016. Lipid oxidation-induced oxidation in beef and pork carboxymyoglobin. Meatingplace. Published online: <http://www.meatingplace.com/Industry/TechnicalArticles/Details/60428>

Burkey, T.E. and M.D. Lindemann*. 2015. An overview of the 2015 Digestive Physiology of Pigs Meeting. 15th Annual Midwest Swine Nutrition Conference, Indianapolis, IN, pp. 49-53.

Bullock, K.D. The Genetics of Horned, Polled and Scurred Cattle. eBeef.org (eXtension). December, 2015

Desai, M.A., V. Jackson, S.P. Suman*, M.N. Nair, C.M. Beach, and M.W. Schilling. Proteome basis of pale, soft, and exudative (PSE) condition in broiler meat from a commercial processing plant. Paper # 4.23. Proceedings, 61st International Congress of Meat Science and Technology, Clermont-Ferrand, France. August 23–28, 2015.

Jang, Y. D., P. Wilcock, R. D. Boyd, and M. D. Lindemann*. 2015. Effect of xylanase supplementation of a phytase-supplemented diet on apparent total tract digestibility (ATTD) in pigs. DPP 2015, Poland. May 18-21. Digestive Physiology of Pigs Book of Abstracts p. 189.

Lehmkuhler, J.W. 2015. Production of Quality Beef for Market Needs from Holstein Dairy Production. Chinese Journal of Animal Science 2015:6:116-120.

- Meng, Q., H.P.S. Makkar, J. McKinnon, P. Beck, D. Gibb, W. Yang, S.J. Bartles, J. Madsen, J.W. Lehmkuhler*, D. Rethorst, R. Burris, D. W. Pethick, and Jean-Francois Hocquette. 2015. The First Symposium on the Applied Techniques and Industry Economics in Chinese Beef Cattle Production. *Viandes & Produits Carnes*. 31:3-6.
- Poore, M.H. and J.W. Lehmkuhler*. 2015. Forages and Pastures Symposium: Use of marginal lands and fibrous byproducts in efficient beef and dairy production systems. *Journal of Animal Science* 93:2607-2608.
- Scaglia, G., P. Beck, M.H. Poore, and J. Lehmkuhler*. 2015. Bill E. Kunkle Interdisciplinary Beef Symposium: Tall fescue toxicosis update. *Journal of Animal Science* 93:5485-5486.
- Van Eenennaam, A. and K. D. Bullock*. Commercial Replacement Heifer Selection. eBeef.org (eXtension). December, 2015
- Canto, A.C.V.C.S., S.P. Suman, M.N. Nair, S. Li, G. Rentfrow, C.M. Beach, T.J. P. Silva, T.L. Wheeler, S.D. Shackelford, A. Grayson, R.O. McKeith, R. and D.A. King. Proteome basis of animal effect on color stability of beef Longissimus lumborum steaks. In proceedings of 60th International Congress of Meat Science and Technology, August 2014, Punta Del Este, Uruguay. Paper # 163.
- Jang, Y., J.Y. Ma, J.S. Monegue, H.J. Monegue, R. Stuart, and M. Lindemann. Effects of fat-soluble vitamin administration on plasma vitamin concentrations in suckling pigs. Pp. 106-110. Proceedings, Comparative Nutrition Soc. 10th biennial meeting, Flat Rock NC. August 2.
- Jang, Y, M. Lindemann, and R. Stuart. Effects of fat-soluble vitamin administration on plasma vitamin concentrations in suckling pigs. p. 30. Proceedings, Allen D. Leman Swine Conference, Minneapolis MN. September 14-16.
- Lawrence, L.M., B.E. Harlow and M.D. Flythe. 2014. Antibiotics and the equine gastrointestinal tract. Proc. Midatlantic Nutrition Conference, Baltimore MD
- Lawrence, L.M. Horse Owner's Hay Guide. Progressive Forage Grower. July 2014
- Lindemann, M.D., and Y. Jang. Sustainable swine production through an improved understanding of feedstuffs and the animal. Pp. 91-102. Proceedings, Biomin's World Nutrition Forum – Sustain:Ability, Munich Germany, October 15-17.
- Miguel, G.Z., M.H. Faria, R.O. Roca, C.T. Santos, S.P. Suman, A.B.G. Faitarone, N.L.C. Delbem, L.V.C. Girao, J.M. Homem, E.K. Barbosa, L.S. Su, F.D. Resende, G.R. Siqueira, and T.V. Savian. Immunocastration improves redness of Longissimus thoracis steaks from feedlot-finished crossbred (Nellore × Aberdeen Angus) cattle in Brazil. Paper # 79. Proceedings, 60th International Congress of Meat Science and Technology, Punta Del Este, Uruguay. August 17–22, 2014.
- Chaplin, R., G. Rentfrow, and S. P. Suman. 2013. Salt penetration in dry-cured hams. The National Provisioner. <http://www.provisioneronline.com/articles/print/98699-salt-penetration-in-dry-cured-hams>
- Kim, D.H., K.R. McLeod, J.L. Klotz, A.F. Koontz, A.P. Foote, and D.L. Harmon. 2013. Application of washed rumen technique for rapid determination of fasting heat production in steers. In: Energy and protein metabolism and nutrition EAAP publ. No. 134 J.W. Oltjen, Ermias Kebreab, H. Lapierre (Eds.). pp. 235-236.

- Koontz, A.F., D.H. Kim, A.P. Foote, L.P. Bush, J.L. Klotz, K.R. McLeod, and D.L. Harmon. 2013. Effect of fescue toxicosis on nitrogen and energy balance in Holstein steers. In: Energy and protein metabolism and nutrition EAAP publ. No. 134 J.W. Oltjen, Ermias Kebreab, H. Lapierre (Eds.). pp. 67-68.
- Lawrence, L. 2013. What is the ideal hay for horses? Proceedings, 2013 Western Alfalfa and Forage Symposium, Reno NV. 11-13 December 2013, UC Cooperative Extension, Plant Sciences Department, University of California Davis CA 95616
- Vanzant, E.S. 2013. Energy and protein supplementation to increase efficiency of forage-based beef cattle production. Proceedings VIII Simposio de Pecuaria de Corte. October 24-26, 2013, Lavras, MG, Brazil. pp 131-154.
- Jang, Y.D., H.J. Monegue, and M.D. Lindemann. 2012. The vitamin D conundrum. 73rd Minnesota Nutrition Conference, Owatonna, MN, September 18, 2012, pages 201-213.
- Lindemann, M.D. 2012. Changes in nursery pig requirements in NRC (2012) and fat utilization of nursery pigs. All Victors Swine Seminar, Wuhan China, August 8, 2012, pages 127 – 166.
- Lindemann, M.D., H.J. Monegue, and Y.D. Jang. 2012. Vitamin D status of pigs from birth to weaning as affected by gavage or injection. 12th Annual Midwest Swine Nutrition Conference, Indianapolis, IN, September 13, 2012, pages 59-63.
- Ramanathan, R., R.A. Mancini, P. Joseph, and S.P. Suman. Lactate-modulated beef mitochondrial oxygen consumption influences oxymyoglobin. Paper # 19. Proceedings, 58th International Congress of Meat Science and Technology, Montreal, Canada. August 12–17, 2012.
- Rentfrow, G., S.P. Suman, and R.T. Chaplin. 2012. Technology of dry cured ham production; Science enhancing art. *Anim. Front.* 2(4):26-31.
- Suman, S.P. 2012. Choosing the best packaging for your specific meat cut. Meatingplace. Published online: <http://www.meatingplace.com/Industry/TechnicalArticles/Details/27707>
- Suman, S.P. 2012. Controlling changes in cooked meat color with packaging. Meatingplace. Published online: <http://www.meatingplace.com/Industry/TechnicalArticles/Details/27676>
- Suman, S.P. 2012. Minimizing cooked meat color changes with antioxidants. Meatingplace. Published online: <http://www.meatingplace.com/Industry/TechnicalArticles/Details/27678>
- Brummer, M., S. Hayes, J. E. Earing, S.M. McCown and L.M. Lawrence. 2011. Effect of selenium depletion on oxidative stress in mature horses. *Journal of Equine Veterinary Science.* 31:257.
- Brummer, M., S. Hayes, S.M. McCown, A.A. Adams, D.W. Horohov and L.M. Lawrence. 2011. Selenium depletion reduces vaccination response in horses. *Journal of Equine Veterinary Science.* 31:266
- Burk, S., M. Rossano, E. Vanzant, W. Silvia, and R. Harmon. 2011. Developing an assessment plan in an animal science department. *Journal of Equine Veterinary Science* 31: 347-348.
- Camargo, F.C., and E. LaBonty. 2010 Kentucky Equine Youth Festival: How to Create an Event that Draws 6,000 People. *Journal of Equine Veterinary Science,* (31)5,6: 342-343, 2011.

- Cromwell, G.L., and G. Rentfrow. 2011. DDGS in swine diets – Does it impact processing of cured bellies and eating quality of pork? Proceedings of the Midwest Swine Nutrition Conference, Indianapolis, IN, September 8, 2011. pp. 10-24.
- Davis, B.E., and L.M. Lawrence, 2011. The effect of endophyte infected tall fescue on weanlings. *Journal of Equine Veterinary Science*. 31:290-291.
- Davis, B.E., and L.M. Lawrence. 2011. Factors affecting live foal rates of Thoroughbred stallions in Kentucky. *Journal of Equine Veterinary Science*. 31:309-310
- Digianantonio, R.N., A.L. Wagner, S.L. Tanner, R.B. Ennis, P.A. Harris, J.T. Sylvester, and K.L. Urschel. Postprandial changes in plasma free amino acids in weanling horses. *Journal of Equine Veterinary Science*, 31(5-6): 328-329, 2011.
- Etz, L.C., N.M. Lambert, J.T. Sylvester, K.L. Urschel, and W.B. Staniar. Supplemental leucine's influence on plasma glucose, insulin and amino acid responses in Quarter Horse yearlings. *Journal of Equine Veterinary Science*, 31(5-6): 248-249, 2011.
- Lawrence, L.M., and M. Flythe. 2011. Microbial Colonization of the Foal's Gastrointestinal Tract. *Equine Disease Quarterly*, January
- Lawrence, L.M. 2011. Broodmare nutrition. *UK Bluegrass Equine Digest*, October.
- Lawrence, L.M. 2011. Managing carbohydrates in equine diets. *Kentucky Breeders' Short Course*, Lexington KY
- Lawrence, L.M. 2011. Forages for horses. In, *Proc. Forages at KCA*, G. Lacefield Ed., Published by the Kentucky Forage and Grassland Council, Lexington KY
- Lindemann, M.D., J.S. Monegue, M.B. Davis, J.M. Dunfee, and K.W. Purser. 2011. Effect of including Cel-Can, an enzymatically hydrolyzed yeast product, in sow diets on pig birth weight. *Proc. 42nd Annual Meeting of the American Association of Swine Veterinarians*, March 6, 2011. pp. 193-196.
- Lindemann, M.D., and Y.L. Ma. 2011. Mineral nutrition for lifetime performance of breeding pigs. *Proceedings of the Eastern Nutrition Conference*, Montreal, Quebec, Canada, May 12, 2011. pp. 115-127.
- Ma, Y.L., and M.D. Lindemann. 2011. Fetal nutrient deposition throughout gestation. *Proceedings of the Midwest Swine Nutrition Conference*, Indianapolis, IN, September 8, 2011. pp. 53-57.
- McCown, S., M. Brummer, S. Hayes, J. Earing and L. Lawrence. 2011. Basal insulin and glucose concentration in gestating and lactating mares. *Journal of Equine Veterinary Science*. 31:247-248.
- McCown, S., M. Brummer, S. Hayes, J. Earing and L. Lawrence. 2011. Nutrient and dry matter intakes of broodmares fed high forage diets. *Journal of Equine Veterinary Science*. 31:264-265.
- Strasinger, L. and L. Lawrence. 2011. Growth rates in 3 and 4 month old foals during the summer in Kentucky. *Journal of Equine Veterinary Science*. 31:286-287.
- Suman, S.P., C. Faustman, and G. Rentfrow. Research priorities in meat science and technology. pp 7–13. In *proceedings of 6th Brazilian Congress of Meat Science and Technology*, October 24-27, 2011, Sao Pedro, Brazil.

Suman, S.P., R.A. Mancini, R. Ramanathan, and P. Joseph. Improving meat color and color stability. pp 177-183. In proceedings of 6th Brazilian Congress of Meat Science and Technology, October 24-27, 2011, Sao Pedro, Brazil.

Suman, S.P., P. Joseph, S. Li, K.M. McClelland, G. Rentfrow, and C.M. Beach. Proteome basis of muscle-specific beef color stability. Paper # 003. In proceedings of 57th International Congress of Meat Science and Technology, August 7-12, 2011, Ghent, Belgium.

Tanner, S.L., A.L. Wagner, R.B. Ennis, and K.L. Urschel. Amino acid concentrations in late lactation mares' milk. *Journal of Equine Veterinary Science*, 31(5-6): 267-268, 2011.

Wagner, A.L., R.B. Ennis, A. Betancourt, A.A. Adams, D.W. Horohov, and K.L. Urschel. The effects of non-steroidal anti-inflammatory drug administration on systemic and muscle inflammation in mature and aged horses. *Journal of Equine Veterinary Science*, 31(5-6): 295-296, 2011.

Patent

Boatright, W.L., 2014. Soy Products with Reduced Levels of Sulfite, Free Radicals and Methanethiol, United States Patent No. 8,664,361.

Genbank Register

Silvia, W.J., Green, J.A. Bison pregnancy associated glycoproteins (8):

JQ 609345.1 JQ 609346.1 JQ 609347.1 JQ 609348.1
JQ 609349.1 JQ 609350.1 JQ 609351.1 JQ 609352.1

Gene Expression Omnibus

Cerny, K.L., R.A.C. Ribeiro, and P.J. Bridges. 2016. Effect of lipopolysachharide (LPS) on the expression of inflammatory mRNAs and microRNAs in the mouse oviduct. Accession #GSE89096, GSE89094 and GSE89095.

Cerny, K.L., and P.J. Bridges*. 2015. Estrogen receptor alpha (ESR1)-dependent regulation of the mouse oviduct. Accession # GSE72614.

Cerny, K.L., W.R. Burris, J.C. Matthews, and P.J. Bridges. 2014. Neonatal testis transcriptome profiles differ among calves born to cows supplemented with different forms of dietary selenium throughout gestation. Accession #GSE62382.

Cerny, K.L., W.R. Burris, M. Van Fleet, A. Slepkin, E.M. Peterson, and P.J. Bridges. 2014. Differential expression of mRNA encoding cytokines and chemokines in the reproductive tract after infection of mice with *Chlamydia trachomatis*. Accession #GSE62461.

Matthews, J.C., R. Hegge, K.L. Cerny, and P.J. Bridges. 2014. Pituitary gene expression profiles of growing beef steers grazing high versus low endophyte-infected tall fescue grass. Accession #GSE62570.

Cerny, K.L., and P.J. Bridges. 2014. Steroid-dependent regulation of bovine oviductal epithelial cells: a transcriptomal analysis of mRNA and miRNA. Accession # GSE63969.

Matthews, J.C., W.R. Burris, J.A. Boling, Z. Zhang, and J.D. Patterson. Released June 1, 2013. Hepatic transcriptome profiles differ among maturing beef heifers supplemented with different forms of dietary selenium. GSE44680.

Ph.D. Dissertations

Fisher, Tatijana. Specialty poultry production: impact of genotype, feed strategies, alternative feedstuffs, and dietary enzymes on the growth performance and carcass characteristics of heritage breed chickens

Murphy, Sean Ecology of two reintroduced black bear populations in the central Appalachians

Yang, Jiayi Relative reactivity of protein and lipid to oxidants in different bi-phasic systems and its implication in sausage quality

Cerny, Katheryn L. Steroid-dependent regulation of the oviduct: A cross-species transcriptomal analysis.

Cetin-Karaca, Hayriye. Antimicrobial efficacy of natural bioactive compounds and high pressure processing against potential pathogens in infant foods.

Harlow, Brittany Elizabeth Davis. Impact of starch source on equine hindgut microbial ecology.

Hung, I-Fen. The effect of dietary nucleotides in sow and nursery piglet diets on reproduction, growth, and immune response.

Tanner, Sara L. Evaluating dietary amino acid adequacy in horses using isotopic techniques.

Anandappa, Marienne A. Evaluating food safety systems development and implementation by quantifying HACCP training durability.

Burk, Steffanie V. Detection of antibodies against parascaris equorum excretory-secretory antigens.

Delles, Rebecca. Dietary antioxidant supplementation (economase-bioplex) to alleviate adverse impacts of oxidized oil on broiler meat quality: a chemical, textural, enzymatic, and proteomic study.

Foote, Andrew P. Effect of ergot alkaloids on bovine foregut vasculature, nutrient absorption, and epithelial barrier function.

Hoar, Melanie E. Use of MTB-100™, provided through a mineral mix, to reduce toxicity when lactating beef cows graze endophyte-infected tall fescue.

Koontz, Anne F. Effects of endophyte infected fescue alkaloid ingestion on energy metabolism, nitrogen balance, in situ feed degradation, and ruminal passage rates.

Liu, Jing. Effect of amylase and protein oxidation on the thermal, rheological, structural, and digestive properties of waxy and common rice flours and starches.

- Miles, Edwena D.* Effect of estradiol supplementation on blood estradiol and metabolite levels, and hepatic protein expression, in growing, mature, and senescent beef cattle.
- Monegue, James S.* Evaluation of the effects of vitamin K on growth performance and bone health in swine.
- Willig, Jennifer A.* Analysis of antiviral and chemoprotective effects of strawberry anthocyanins.
- Brummer, Mieke* The Influence of Selenium Status on Immune Function and Antioxidant Status in the Horse
- Holder, Vaughn Barry* The Effects of Slow Release Urea on Nitrogen Metabolism in Cattle
- Johnson, Joseph Samuel* Foraging and Roosting Behaviors of Rafinesque's Big-eared Bat (*Corynorhinus Rafinesquii*) at the Northern Edge of the Species Range
- Macalintal, Lizza M* In Ovo Selenium (SE) Injection of Incubating Chicken Eggs: Effects on Embryo Viability, Tissue SE Concentration, Lipid Peroxidation, Immune Response and Post Hatch Development
- Quant, Anthony D* Evaluating the Effects of Maternal and Progeny Dietary Supplementation of Selenium Yeast and Vitamin E on the Performance of Broiler-Breeder Hens and Performance and Meat Quality of Progeny
- Skudlarek, Jamie R. Greene* Antimicrobial Efficacy of Edible Soy Protein Isolate Films and Coatings Incorporated with Hop Ethanol Extract and the Influence on Shelf-Life and Sensory Attributes of Bologna
- Smith, Jacqueline Lee* Temporal Analysis of Electronically Collected Physical Activity Data to Assess Health Status of Beef Cattle
- Zhao, Jing* The Fate of Antioxidative Soy Peptides after Reactions with Hydroxyl Radicals and Lipid Oxidation-Derived Aldehydes
- Barding, Erin* The Recovery of the River Otter (*LONTRA CANADENSIS*) in Kentucky: Status, Distribution, Diet, Reproductive Characteristics and Management of a Reintroduced Species
- Earing, Jennifer* Comparison of Digestive Function in Young and Mature Horses
- Godoy, Maria* Fish Oil and Barley Supplementation in Diets for Adult Dogs: Effects on Lipid and Protein Metabolism, Nutrient Digestibility, Fecal Quality, and Postprandial Glycemia
- Harris, Hannah* The Return of the Black Bear to Eastern Kentucky: Conflict and Tolerance between People and Wildlife
- Hudson, Melissa* The Effects of Nutritionally-Modulated Parturition BCS on Pre- and Postpartum Metabolic Responses, in vitro Lipid Metabolism and Performance of Multiparous Beef Cows
- Joseph, Poulson* Proteomics of Color Phenomena in Red Meats and Poultry
- Kitts, Beth* Effects of Adipogenic Compounds on Growth Performance, Hormonal Status and Fat Deposition in Finishing Beef Steers

Liebold, Chris Characterization of Long-lived Radicals in Soy Protein

Ma, Yulin Evaluation of the Effects of Organic Minerals in Growing Pigs and in Nutrient Changes in Fetal and Maternal Tissues

Wagner, Ashley Factors Affecting Skeletal Muscle Protein Synthesis in the Horse

M.S. Theses

Latham, Christine Effects of dietary amino acid supplementation on measures of whole-body and muscle protein metabolism in aged horses

Meng, Luxi Acoustic Emission of *Lactococcus lactis* ssp. *lactis* C2 Infected with Three Bacteriophages c2, sk1 and ml3

Mimiko, Jasmyn Relationships between behavioral measures and productivity in finishing beef cattle

Pesqueira, Amanda Fatty acid profile in ruminal content and blood plasma of finishing beef cattle, supplemented with different sources of fat

Pyles, Morgan Effect of maternal diet on select fecal bacteria in mares and their foals

Smith, Kelsey Towards determination of the threonine requirement of yearling horses fed varying dietary compositions using the indicator amino acid oxidation method

Wood, Lauren Post weaning supplementation of April-born Polypay and White Dorper lambs grazing alfalfa/orchardgrass pasture

There were no non-thesis master's degrees in 2016

Altman, Alexander W. Impact of endophyte-infected tall fescue seed on the acute phase and metabolic responses of cattle during an immunological challenge.

Borchers, Matthew Richard. An evaluation of precision dairy farming technology adoption, perception, effectiveness, and use.

Bruno, Kelsey. Relationships between behavioral measures and productivity in growing beef cattle.

Dolecheck, Karmella Ann. Assessment of the technical and economic potential of automated estrus detection technologies for dairy cattle.

Eckelkamp, Elizabeth A. Compost bedded pack barns for dairy cattle: bedding performance and mastitis as compared to sand freestalls.

Lim, Jina. Evaluation of L-Methionine bioavailability in nursery pigs.

Mañón, Alfredo. Interaction of dietary supplements of organic trace minerals and phytase on growth performance and mineral metabolism of replacement pullets.

Mayo, Lauren M. Assessing the efficacy of automated detection of estrus in dairy cattle.

Mok, Chan Hee. Using the indicator amino acid oxidation technique to study threonine requirements in horses fed different feed compositions.

Norcross, Rebecca G. Impact of algae supplemented diets combined with antioxidants on the nutritional profile, quality attributes, and storage stability of chicken breast meat.

Paul, Marquisha A. Effects of post-hatch holding time and early nutrition strategies on growth performance, carcass and skeletal characteristics of young chickens.

Weatherly, Maegan E. Algae or yeast supplementation for lactating dairy cows.

There were no non-thesis master's degrees in 2015

Cox, Traci Jane. The acoustic emissions produced by escherichia coli during the growth cycle.

Egert, Amanda M. Effect of dietary exposure to ergot alkaloids on contractility of bovine mesenteric vasculature and rumen motility.

Garbacik, Stefani R. Gestational form of supplemental selenium (Se) affects steroidogenic gene expression in the newborn calf testis.

Hansen, Tayler L. Modeling digestibility and rate of passage in horses.

Jia, Yang. Interaction of isoflavones and endophyte-infected tall fescue seed extract on vasoactivity of bovine mesenteric vasculature.

O'Niones, Kevin J. Rheological, foam, and physical properties of low sucrose meringue and angel food cake formulated with non-nutritive sweeteners and polydextrose.

Thomas, Amanda Shaw. An assessment of two feed additives to improve feed utilization in pigs.

Wadsworth, Barbara Alice. The impact of dual chamber cow waterbeds as a freestall base.

Whitehouse, Catherine. Evaluation of a novel feedstuff for horses.

Wingard, Sheryl. Effect of direct-fed microbials and monensin on in vitro rumen fermentation.

Black, Randi Alyson. Compost bedded pack barns: management practices and economic implications.

Fowler, Ashley. Phosphorus digestibility and phytate degradation in long yearlings and mature horses.

Good, Lindsay. The effects of Actigen® and threonine supplementation on growth parameters, immune function, and intestinal health in monogastrics.

Harlow, Brittany E. Changes to the equine hindgut microflora in response to antibiotic challenge

Kenney, Nicole. Impact of direct-fed microbials on nutrient utilization in beef cattle.

Liang, Di. Estimating the economic losses from diseases and extended days open with a farm-level stochastic model.

Mastro, Laurel. The effect of pituitary pars intermedia dysfunction on protein metabolism and insulin sensitivity in aged horses

Slaughter, Leeann L. Antilisterial characteristics of volatile essential oils.

Sterrett, Amanda E. Management and technology solutions for improving milk quality.

van Benschoten, Megan D. Effects of a proprietary premix on productive performance and egg quality of white and brown egg laying hens fed diets high in distillers dried grains with soluble (DDGS).

Escobar, Carlos S Effect of Feeding a Blend of Naturally-Contaminated Corn on Nutrient Digestibility and Feed Preference in Weaning Pigs

Nair, Mahesh Narayanan Species-Specific Interactions Between Myoglobin and Small Biomolecules

Schaeffer, Caleb A Distiller's Grains Supplementation For Beef Steers Consuming Tall Fescue: Forage Utilization and Steer Growth

Zhang, Zhi Influence of Dietary Selenium Supplementation Form on Hepatic Transcriptome Profiles of Maturing Beef Heifers

Cetin Karaca, Hayriye Evaluation of Natural Antimicrobial Phenolic Compounds against Foodborne Pathogens

Jackson, Josh Duration of Grazing High Versus Low Endophyte (*Neotyphodium coenophialum*)-Infected Tall Fescue by Growing Steers Differentially Affects Blood Concentrations of Prolactin, Enzymes, and Metabolites

Liu, Changqi Variations in the Cross-Linking Pattern of Chicken White and Red Muscle Myofibrillar Proteins Induced by Oxidative Stress or Microbial Transglutaminase

Martin, Sarah Dietary Effects of Histidine, Magnesium, Dietary Cation Anion Balance, and Cranberry Pomace on Histamine Kinetics and Urine Acidity in the Domestic Feline

McCown, Shawna Voluntary Intake in Gestating and Lactating Mares

Simpson, Melinda Use of Copper Sulfate to Control *Haemonchus contortus* Infestation in Hampshire Ewes

Zinner, Rachel Adaptation of Lambs to an Endophyte Infected Tall Fescue Seed Diet

Appendix JJ

Extension Publications

APPENDIX JJ - Extension Publications

Beef Extension Publications

Fact Sheets

- R. Burris, K. D. Bullock, L. Anderson, J.W. Lehmkuhler, M. Arnold, R. Smith, and D. Shepherd. 2017. Beef Integrated Resource Management Calendars. AGR-CAL.
- K. D. Bullock. Simple Inheritance in Beef Cattle. eBeef.org (January, 2017).
- R. Burris, K. D. Bullock, L. Anderson, J.W. Lehmkuhler, M. Arnold, R. Smith, and D. Shepherd. 2016. Beef Integrated Resource Management Calendars. AGR-CAL.
- R. Burris, K. D. Bullock, L. Anderson, J.W. Lehmkuhler, M. Arnold, R. Smith, and D. Shepherd. 2015. Beef Integrated Resource Management Calendars. AGR-CAL.
- Greg Halich, Fred Martz, Lee Meyer, Ray Smith, Jeff Lehmkuhler, Gregg Rentfrow. Producer's Guide to Pasture-Based Beef Finishing. ID-224. 2015.
- K. D. Bullock. The Genetics of Horned, Polled and Scurred Cattle. eBeef.org (December, 2015).
- Van Eenennaam and K. D. Bullock. Commercial Replacement Heifer Selection. eBeef.org (December, 2015).
- R. Burris, K. D. Bullock, L. Anderson, J.W. Lehmkuhler, M. Arnold, R. Smith, and D. Shepherd. 2014. Beef Integrated Resource Management Calendars. AGR-CAL.
- Michelle Arnold and Jeff Lehmkuhler. Forage-Related Cattle Disorders Brassicas: Be Aware of the Animal Health Risks. ID-223. 2014.
- Michelle Arnold and Jeff Lehmkuhler. Forage-Related Cattle Disorders Hypomagnesemic Tetany or "Grass Tetany". ID-226. 2014.
- Michelle Arnold, Cynthia Gaskill, Jeff Lehmkuhler and Ray Smith. Forage Related Disorders Nitrate Poisoning. ID-217. 2014
- Jeff Lehmkuhler, Roy Burris, Donna Amaral-Phillips. Mineral and Protein Blocks and Tubs for Beef Cattle. ASC-215 2014. K. D. Bullock. Mating Systems in Commercial Beef Cattle Operations. eBeef.org (November, 2014).
- K. D. Bullock. Genetic Practices to Improve Beef Cattle Reproduction. eBeef.org (November, 2014).
- S. Bessin and K. D. Bullock. Expected Progeny Differences Trait Definitions and Utilizing Percentile Tables. ASC-211(January 2014). Mr. Bessin is a former student that I worked with to develop this factsheet while he was serving an internship in the Madison County Extension office.
- R. Burris, K. D. Bullock, L. Anderson, J.W. Lehmkuhler, M. Arnold, R. Smith, and D. Shepherd. 2013. Beef Integrated Resource Management Calendars. AGR-CAL.
- Steve Higgins, Sarah Wightman, and Jeff Lehmkuhler. Feedlot Design and Management for Backgrounding and Stocker Operations. AEN-110. 2013.
- Halich, G, K. Burdine, and J. Lehmkuhler. Drought-stressed Corn Silage Valuation – 2012 Guide. ID-205. 2013.
- R. Burris, K. D. Bullock, L. Anderson, J.W. Lehmkuhler, M. Arnold, R. Smith, and D. Shepherd. 2012. Beef Integrated Resource Management Calendars. AGR-CAL.
- Jeffrey W. Lehmkuhler and W. Roy Burris. Distillers Grain Coproducts for Beef Cattle. ASC-186. 2011.
- Jeff Lehmkuhler, Roy Burris, Michelle Arnold, Ray Smith and Garry Lacefield. Managing Legume-Induced Bloat in Cattle. ID-186. 2011.
- Smith, R., G. Lacefield, R. Burris, D. Ditsch, B. Coleman, J. Lehmkuhler, and J. Henning. Rotational Grazing. ID-143. 2011.
- S. Higgins, S. Wrightman, and J. Lehmkuhler. Strategic Winter Feeding of Cattle Using a Rotational Grazing Structure. ID-188. 2011.
- R. Burris, K. D. Bullock, L. Anderson, J.W. Lehmkuhler, M. Arnold, R. Smith, and D. Shepherd. 2011. Beef Integrated Resource Management Calendars. AGR-CAL.

Educational Videos

- Bale Grazing. 2016. View at: <https://youtu.be/1AzktSfF4N8>
- Mid-South Stocker Virtual Farm Tour. Bob Hall's Backgrounding Operation. 2015. View at <https://youtu.be/N4FK20YFfdU> Full production of video.
- Mid-South Stocker Virtual Farm Tour. Kevin Laurent Stocker Operation. 2015. View at <https://youtu.be/mhKjpC12gmY> Full production of video.
- Cattle Handling and Care Certification. 2014.
- Mid-South Stocker Virtual Farm Tour. 2014. Kim Muir 4 C Cattle Operation. Full production of video. Available upon request.
- Cattle Handling and Care Certification. (2014) K. D. Bullock, K. Laurent, R. Burris, M. Arnold, J. Lehmkuhler, L. Anderson, P. Prater and B. Paul.
- Mid-South Stocker Virtual Farm Tour. Cooper Brothers Backgrounding Operation. 2013. View at <http://video.ca.uky.edu/videos/video/842/>. Developed interview content, shot list, and assisted with editing.
- Mid-South Stocker Virtual Farm Tour. Charles Miller Backgrounding Operation. 2013. View at <http://youtu.be/lqh2r3UKCXI>. Developed interview content, shot list, and assisted with editing.
- High Density Grazing. 2012. Co-host discussion on high density grazing management for beef cattle. View at <http://youtu.be/hJzph50BRQc>.
- Kentucky Master Stocker Video Series. 2012. Edited and produced a series of 8 videos capturing the instructors' presentations. (DVD's available upon request)
- Mid-South Stocker Virtual Farm Tour. Harper Cattle Company. 2012. Full production of video. Available upon request.
- Master Grazer Video Series. 2011/2012. Presenter for sessions related to livestock management. (DVD's available upon request)
- Cattle Genomics and Ultrasound. YouTube Video (2012). K. D. Bullock
- Mid-South Stocker Virtual Farm Tour. Benny Gilbert Stocker Cattle Operation. 2011. View at <http://video.ca.uky.edu/videos/video/64/>. Developed interview content and shot list for video.
- Mid-South Stocker Virtual Farm Tour. Roy Reichenbach Backgrounding Operation. 2011. View at <http://video.ca.uky.edu/videos/video/62/>. Developed interview content and shot list for video.
- Mid-South Stocker Virtual Farm Tour. Troy Ellis Cow-calf Operation. 2011. View at <http://video.ca.uky.edu/videos/video/61/>. Developed interview content and shot list for video.

Educational Presentations

- Utilizing Genetics and Handling Techniques for Improved Cattle Care. IACUC Training Module – 1.1.15 (January 2015)
- Genetic Defects in Beef Cattle. IACUC Training Module – 2.1.13 (November 2013)

Decision Support Tools

- Tub Energy Estimator Tool. J Lehmkuhler. 2013. Using information from product tag, an energy estimate is calculated to determine if product will meet beef cow needs, cost comparison to alternative energy/protein source.
- Mineral Product Comparison Tool. J Lehmkuhler. 2011. Allows individual to enter mineral tag specifications and compare up to three mineral products.
- Creep Feeding Decision Tool. J Lehmkuhler. 2011. Used by developer to illustrate and answer questions related to creep feeding of nursing beef calves.

- Beef Cow Forage Supplement Tool. K. Laurent, J. Lehmkuhler and R. Burris. It is a web based application that utilizes forage analysis information to estimate forage intake and supplementation rates for beef cows on free choice forage based diets.

Proceedings

- Bullock, K. D., D. Brown and L. Keenan. 2017. The Power of Economic Selection Indices to Make Genetic Change in Profitability. Proceedings Beef Improvement Federation 49th Research Symposium and Annual Meeting. pp 73.

Refereed Journal Articles

- Cerny, K. E., Garrett, A. J. Walton, L. H. Anderson, P. Bridges. 2015. Form of supplemental selenium fed to cycling cows affects systemic concentrations of progesterone, but not estradiol. *Theriogenology*. 85:800-806.
- Cerny, K., E. Garrett, A. J. Walton, L. H. Anderson, P. Bridges. 2015. A transcriptomal analysis of bovine oviductal epithelial cells collected during the follicular phase versus the luteal phase of the estrous cycle. *Repro. Bio. Endo.* 13:84. DOI 10.1186/s12958-015-0077-1.

Abstracts

- Bullock, K. D., B. R. Crites, W. R. Burris, J. Lehmkuhler, L. Anderson, M. Arnold, K. Laurent, B. Knight, B. Thompson and P. Prater. 2017. Effectiveness of a Certification Program to Facilitate Practice Change in Cattle Handling and Care. *J. Anim. Sci.* Vol 95 E-Suppl.
- Crites, B. R., G. Conway, E. S. Vanzant, K. D. Bullock, J. W. Lehmkuhler, W. R. Burris, and L. Anderson. 2017. Relationships of Production Practices for Producers Participating in the UK Beef IRM Farm Program. *J. Anim. Sci.* Vol 95 E-Suppl.
- Crites, B. R., G. Conway, E. S. Vanzant, K. D. Bullock, J. W. Lehmkuhler, W. R. Burris, and L. Anderson. 2017. Comparison of Production Practices for Producers Participating in the UK Beef IRM Farm Program and USDA NAHMS Survey Data. *J. Anim. Sci.* Vol 95 E-Suppl.
- Bullock, K. D., L. Anderson, J. Lehmkuhler, R. Burris. 2013. Misconceptions That Lead to Straightbreeding in Commercial Beef Cattle Operations. *J. Anim. Sci.* Vol 91 E-Suppl 1
- Anderson, L. H., K. D. Bullock, J. D. Rhinehart, J. W. Lehmkuhler, W. R. Burris. 2013. The Kentucky Beef Leadership Program: Empowering Industry Leaders to Shape Educational Programming. *J. Anim. Sci.* Vol 91 E-Suppl 1
- Rhinehart, J. D., L.H. Anderson, F.N. Shrick, A. Fisher, A.M. Arnett, R. Burris and M. DeJarnette. 2012. Does altering the timing of insemination with gender sorted bovine semen affect pregnancy rates. Paper 72.
- Anderson, L. H., K. D. Bullock, J. D. Rhinehart, J. W. Lehmkuhler, W. R. Burris. 2011. Using Estrus Synchronization and AI to improve market value of calves. *J. Anim. Sci.* Vol 88 Suppl 3
- Burris, R., L. Anderson, D. Bullock, J. Lehmkuhler and J. Randolph. 2011. Forage/management systems for beef cow calf production. *J. Anim. Sci.* Vol 88 Suppl 3
- Rhinehart, J. D., A.M. Arnett, L.H. Anderson, W.D. Whittier, J.E. Larson, W.R. Burris, J.B. Elmore, D.T. Dean and J.M. DeJarnette. 2011. Conception rates of sex-sorted semen in beef heifers and cows. *ASAS – So. Section.* Paper 93.

Dairy Extension Publications

DAIReNET Publications

- Amaral-Phillips, D.M. 2017. Understanding Metritis in Dairy Cows.
- Amaral-Phillips, D.M. 2017. Dairy Calf and Heifer Management Practices Impact Future Production.
- Kelly, K. and D.M. Amaral-Phillips. 2017. Weaning Calves from an Automatic Feeder.
- Amaral-Phillips, D.M. 2016. Using Your Feed Resources, Labor, and Dollars Wisely.
- Amaral-Phillips, D.M. 2016. Targeting Dairy Feeding Programs for Less Feed Waste or Shrink.
- Amaral-Phillips, D.M. 2016. Considerations when Planning Dairy Calf and Heifer Facilities.
- Amaral-Phillips, D.M. 2015. Bunker Silo and Drive-Over Silage-Pile Management.
- Weatherly, Meagan and D.M. Amaral-Phillips. 2015. Dairy Cattle Water Consumption Management.
- Amaral-Phillips, D.M. 2015. Top Ways to Tweak Dairy Nutritional Management to Improve Profitability: Part 2.
- Amaral-Phillips, D.M. 2015. Top Ways to Tweak Dairy Nutritional Management to Improve Profitability: Part 1.
- Amaral-Phillips, D.M. 2014. Managing Labor Responsible for Feeding the Lactating Dairy Herd.
- Amaral-Phillips, D.M. 2014. What are Your Dairy Cows Telling You about Their Nutrition Program?
- Amaral-Phillips, D.M. 2014. Subclinical Hypocalcemia, or Milk Fever, in Dairy Cows- Why All the Fuss?
- Amaral-Phillips, D.M. 2013. Management of Fresh Dairy Cows Critical for a Dairy's Profitability.
- Amaral-Phillips, D.M. 2013. Managing a Grazing System for a Milking Dairy Herd.
- Amaral-Phillips, D.M. 2013. Dairy Feeding and Management Considerations during Heat Stress.
- Amaral-Phillips, D.M. 2013. Management Practices before Calving Help Prevent Fresh Dairy Cows from Becoming "Losers".
- Amaral-Phillips, D.M. 2012. Early Identification of Sick Dairy Calves Important to Their Survival and Future Milk Production.
- Amaral-Phillips, D.M. 2012. Checklist for the Top 5 Priorities for Fall/Winter Dairy Feeding Programs.
- Amaral-Phillips, D.M. 2012. Strategies to Deal with Volatility and Increased Dairy Feed Costs.

Fact Sheets

- Sterrett, A., D.M. Amaral-Phillips, J. Bewley, and M. Arnold. 2014. A fresh cow health monitoring system (ID-218).
- Lehmkuhler, J., R. Burris, and D.M. Amaral-Phillips. 2014. Mineral and protein blocks and tubs for beef cattle (ASC-215).
- Bewley, J. and D.M. Amaral-Phillips. 2013. Using DHIA Records for somatic cell count management (ID-212).
- Amaral-Phillips, D.M. 2012. Can Rolling Herd Averages Help You Manage Your Dairy Operation?
- Amaral-Phillips, D.M. 2012. Early Detection of Potential Nutrition and Management Problems in Dairy Herds Using DHI-Monthly Milk Production.
- Amaral-Phillips, D.M. 2012. Using your DHI Data to Evaluate your Feeding Program Interpreting Standardized 150 Day Milk.
- Amaral-Phillips, D.M. 2012. Using Peak and Summit Milk to Evaluate Your Dairy's Management Programs.

Other Extension Publications

- Bewley, J.M. 2016. Are You Getting the Most Out of Your Fans? Kentucky Dairy Notes (July).
- Wadsworth, B.A. and J.M. Bewley. 2016. Heat Stress is a Hot Topic. Kentucky Dairy Notes (May).
- Lee, A.R. and J.M. Bewley. 2016. What Can We Learn about Managing Metritis? (April).
- Nolan, D.T. and J.M. Bewley. 2016. Management Practices Associated with Milk Quality (January).
- Borchers, M.R., K.A. Dolecheck, and J.M. Bewley. 2015. Five New Developments in Precision Dairy. Kentucky Dairy Notes. (December).
- Borchers, M.R. and J.M. Bewley. 2015. The effects of stress on transition cow and calf health. Kentucky Dairy Notes (December).
- Eckelkamp, E. A. and J.M. Bewley. 2015. Keeping up with ketosis. in Dairy Notes. Kentucky Dairy Notes (December).
- Tsai, I.C. and J.M. Bewley. 2015. The Cause and Detection of Lameness in Dairy Cows. Kentucky Dairy Notes (December).
- Dolecheck, K.A. and J.M. Bewley. 2015. How much are you losing from extra days open? Kentucky Dairy Notes. (November).
- Thompson, A.C. and J.M. Bewley. 2015. Managing and controlling digital dermatitis. Kentucky Dairy Notes. (November).
- Stone, A.E. and J.M. Bewley. 2015. Maintaining Animal Health in Organic Dairy Herds. Kentucky Dairy Notes. (November).
- Thompson, A.C. and J.M. Bewley. 2015. Understanding digital dermatitis. Kentucky Dairy Notes. (October).
- Dolecheck, K.A. and J.M. Bewley. 2015. Dairy Around the World. Kentucky Dairy Notes. (October).
- Borchers, M.R. and J.M. Bewley. 2015. Promoting dairy cattle health through the transition period and into early lactation. Kentucky Dairy Notes (July).
- Eckelkamp, E. A. and J.M. Bewley. 2015. Heating it up with heat stress. Kentucky Dairy Notes (May).
- 16. Wadsworth, B.A. and J.M. Bewley. 2015. Calves: the future of our industry. Kentucky Dairy Notes (May).
- Wadsworth, B.A., A.E. Stone, L.M. Mayo, I.C. Tsai, and J.M. Bewley. 2015 Methods of Precisely Managing Precision Dairy Farming Technologies On-Farm. Kentucky Dairy Notes (May).
- Mayo, L.M. and J.M. Bewley. 2015. Improving the Science Behind More Reliable Dairy Cattle Performance Predictions. Kentucky Dairy Notes (April).
- Nolan, D.T. and J.M. Bewley. 2015. Hot sheet dashboard user guide. Kentucky Dairy Notes (March).
- Nolan, D.T. and J.M. Bewley. 2015. The assessment of dairy farm profitability under a variety of management techniques. Kentucky Dairy Notes (February).
- Weatherly, M.E. and J.M. Bewley. 2015. Feeding behavior and cow welfare. Kentucky Dairy Notes (February).
- Dolecheck, K.A. and J.M. Bewley. 2015. “Fresh” Forage Research. Kentucky Dairy Notes. January.

Refereed Journal Articles

- Liang, D., L.M. Arnold, C.J. Stowe, R.J. Harmon, and J.M. Bewley. 2016. Estimating U.S. clinical dairy disease costs with a stochastic simulation model. *J. Dairy Sci.* (Accepted)
- Dolecheck, K.A., G. Heersche, Jr., and J.M. Bewley. 2016. Retention pay-off based cost of days open regression equations: Application in a user-friendly decision support tool for investment analysis of automated estrus detection technologies. *J. Dairy Sci.* Article in Press.

- Klefot, J. M., J. L. Murphy, K. D. Donohue, B. F. O'Hara, M. E. Lhamon, and J. M. Bewley. 2016. Development of a noninvasive system for monitoring dairy cattle sleep. *Journal of Dairy Science* 99(10):8477-8485.
- Shelley, A., D. Lau, A.E. Stone, and J.M. Bewley. 2016. Short communication: Measuring feed volume and weight by machine vision. *J Dairy Sci.* 99(1):386-391.
- Eckelkamp, E. A., J. L. Taraba, K. A. Akers, R. J. Harmon, and J.M. Bewley. 2016. Sand bedded freestall and compost bedded pack effects on cow hygiene, locomotion, and mastitis indicators. *Livest. Sci.* 190:48-57.
- Eckelkamp, E. A., J. L. Taraba, K. A. Akers, R. J. Harmon, and J.M. Bewley. 2016. Understanding compost bedded pack barns: Interactions among environmental factors, bedding characteristics, and udder health. *Livest. Sci.* 190:35-42.
- Dolecheck, K.A., W.J. Silvia, G. Heersche, Jr., C.L. Wood, K.J. McQuerry, and J.M. Bewley. 2016. A comparison of timed artificial insemination and automated activity monitoring with hormone intervention in three commercial dairy herds. *J Dairy Sci.* 99(2):1506-14.
- Borchers, M.R., Y.M. Chang, I.C. Tsai, B.A. Wadsworth, and J.M. Bewley. 2016. A validation of technologies monitoring dairy cow feeding, ruminating, and lying behaviors. *J. Dairy Sci.* 99.7458-7466.
- Dolecheck, K.A., W.J. Silvia, G. Heersche Jr, Y.M. Chang, D.L. Ray, A.E. Stone, B.A. Wadsworth, and J.M. Bewley. 2015. Behavioral and physiological changes around estrus events identified using multiple automated monitoring technologies. *J. Dairy Sci.* 98:8723-8731.
- Lowe, J.L., A.E. Stone, K.A. Akers, J.D. Clark, and J.M. Bewley. 2015. Effect of alley-floor scraping frequency on *Escherichia coli*, *Klebsiella* species, environmental *Streptococcus* species, and coliform counts. *The Professional Animal Scientist* 31(3):284-289.
- Wadsworth, B.A., A.E. Stone, J.D. Clark, D.L. Ray, and J.M. Bewley. 2015. Stall cleanliness and stall temperature of two different freestall bases. *J. Dairy Sci.* 98 (6): 4206-4210.
- Borchers, M. R. and J. M. Bewley. 2015. An assessment of producer precision dairy farming technology use, prepurchase considerations, and usefulness. *J. Dairy Sci.* 98(6):4198-4205.
- Smith, A.C., C.L. Wood, K.J. McQuerry, and J.M. Bewley. 2014. Effect of a tea tree oil and organic acid footbath solution on digital dermatitis in dairy cattle. *J. Dairy Sci.* 97: 2498-2501.
- Black, R.A., J.L. Taraba, G.B. Day, F.A. Damasceno, M.C. Newman, K.A. Akers, C.L. Wood, K.J. McQuerry, and J.M. Bewley. 2014. The relationship between compost bedded pack performance and management and bacterial concentrations. *J. Dairy Sci.* 97: 2669-2679.
- Halachmi I, M.Klopjic, P.Polak, D.J.Roberts, and J.M. Bewley. 2013. Assessment of dairy cattle body condition score using thermal imaging. *Computers and Electronics in Agriculture.* 99: 35-40.
- Eckelkamp, E.A., C. N. Gravatte, C. O. Coombs, and J.M. Bewley. 2013. Case Study: characterization of lying behavior in dairy cows transitioning from a freestall barn with pasture access to a compost bedded pack barn. *Professional Animal Scientist.* 30:109-113
- Black, R.A., J.L. Taraba, G.B. Day, F. A. Damasceno, and J.M. Bewley. 2013. Compost bedded pack dairy barn management, performance, and producer satisfaction. *J. Dairy Sci.* 96: 8060-8074.
- Liang, D., C.L. Wood, K.J. McQuerry, D.L Ray, J.D Clark, and J.M Bewley. 2013. Influence of breed, milk production, season, and ambient temperature on dairy cow reticulorumen temperature. *J. Dairy Sci.* 96: 5072-5081.
- Sterrett, A.E. and J.M. Bewley. 2013. Characterization of management practices used by low somatic cell count Kentucky dairy herds. *Professional Animal Scientist.* 29: 359-366.
- Smith, A.C., C.O. Coombs, and J.M. Bewley. 2013. Management practices employed by top Kentucky milk production herds. *Professional Animal Scientist.* 29: 367-371.
- Smith, S.M., E.A. Chaney, and J.M. Bewley. 2013. Short Communication: Planning Considerations for On-Farm Dairy Processing Enterprises. *J. Dairy Sci.* 96: 4519-4522.
- Sterrett, A.E., C.L. Wood, K.J. McQuerry, J.M. Bewley. 2013. Changes in teat end

hyperkeratosis after installation of an individual quarter pulsation milking system. *J. Dairy Sci.* 96: 4041-4046.

- Russell, R.A. and J.M. Bewley. 2013. Characterization of Kentucky dairy producer decision making behavior. *J. Dairy Sci.* 96: 4751-4758

Equine Extension Publications

Fact Sheets

- Help! My Horse Roars! What Is Laryngeal Hemiplegia? Fernanda Camargo. ASC-226, 2016.
- Equine Metabolic Syndrome: Is My Horse Just Fat, or Is He Sick? Fernanda Camargo and Amanda Adams. ID-239, 2016.
- Hosting a Horse Show. Fernanda Camargo and Amy Lawyer, 4AF-06MA, 2014
- Stereotypic Behavior in Horses: Weaving, Stall Walking, and Cribbing. Fernanda C Camargo, ASC 212, 2014.
- Selecting Feeds for Horses. Laurie Lawrence and Fernanda Camargo, ASC 205, 2013.
- Feeding the Broodmare. Laurie Lawrence and Fernanda Camargo. Fact Sheet ASC-185, 2013.
- Feeding the Broodmare. Laurie Lawrence and Fernanda Camargo. Fact Sheet ASC-185, 2012.
- Help! My Horse is Too Thin. Fernanda Camargo, Laurie Lawrence and Bob Coleman. Fact Sheet ASC-188, 2012.
- Help! My Horse is Too Fat. Fernanda Camargo, Laurie Lawrence and Bob Coleman. Fact Sheet ASC-187, 2012.
- Equine Viral Arteritis. Fernanda Camargo, Amy Lawyer and Peter Timoney. Fact Sheet ID-197, 2011.
- Preventing Barn Fire: Tips for Horse Owners. Fernanda C. Camargo and Essie Rogers. Fact Sheet ASC-184, 2011.
- Horses and Rain. Fernanda C. Camargo. Fact Sheet ASC-183, 2011.
- Equine Infectious Anemia. Fernanda C. Camargo. Fact Sheet ASC-181, 2011.
- Colic in Horses. Fernanda C. Camargo. I revised and updated this publication. Fact Sheet ASC-128, 2011.
- Methods of Identification for Horses. Fernanda C. Camargo. I revised and updated this publication. Fact Sheet ASC-146, 2011.

Other Extension Publications

- Safe Return to Riding (2016): Saddle Up Safely brochure. I am part of the committee responsible for creating the content and doing the final review. For this publication I wrote the section "Returning after a long absence from horse riding"
- Trailering your Horse Safely (2014): Saddle Up Safely brochure. I am part of the committee responsible for creating the content and doing the final review. For this brochure I was also responsible for "creating the scene" for many of the photos used.
- Travel to a New Environment (2014): Saddle Up Safely brochure. I am part of the committee responsible for creating the content and doing the final review.
- Featured on Horse Illustrated Magazine in November 2013 with my personal horse Mattie, QNR Rhythym N' Blues.
- Barn Safety (2013): Saddle Up Safely brochure. I am part of the committee responsible for creating the content and doing the final review.
- Contributing author of "Cost of Horse ownership" by Nancy Loving, DVM. *The Horse Magazine*, 2012.
- Pekarchik, K., Camargo, F.C. Evaluating your Horse's Body Condition, *Bluegrass Equine Digest*, April 2011, pp. 9-11, *The Horse Magazine*.
- Pekarchik, K., Camargo, F.C. Planning for the State 4-H Horse Show, *Agents Exclusive Newsletter*, June 2011.

- A slippery situation: selecting the best oil for a horse's diet, by Jen Roytz. Expert, provided content. <http://www.paulickreport.com/horse-care-category/nutrition/a-slippery-situation-selecting-the-best-oil-for-a-horses-diet/>

Book Chapters

- R.M. Dwyer "Biosecurity in the Breeding Shed" J. Lavoie (ed) Blackwell's Five-Minute Veterinary Consult: Equine, 3rd edition.. John Wiley & Sons, Inc., Hoboken, NJ, in press.

Educational Videos

- Safe Blanketing
- Safe: Trailer check
- Safe: English Tack check
- Safe: Turning horses out
- Safe: Horse Related Concussions
- Safe: Cross tying horses
- Safe: Fitting a rope halter
- Safe: Fitting a bridle
- Safe: fitting a leather halter
- Safe: How to bridle a horse
- Safe: How to tie a horse
- Helping your horse lose weight
- Helping your horse gain weight
- Safe: Western tack check
- Safe: Loading and unloading your horse from trailer
- Safe: Tying a horse inside trailer
- Safe: Hay nets and bags in trailers

Smartphone App

- Healthy Horse App available to horse owners to estimate their horse's current and ideal body weight. This was done in collaboration with the University of Minnesota.

Refereed Journal Articles

- Camargo, F. Horse Species Symposium: Recent advances in the microbiome and physiology of the hindgut of the horse and dog, *Journal of Animal Sciences* 94(6):2245-6, June 2016
- Gombeski Jr., W., Camargo, F., Wiemers, H., Jehlik, C., Barger, P., Mead, J. Preventing horse related injuries by watching out for other humans. *International Journal of Travel and Tourism*, 19:11-16, 2017

Abstracts

- Camargo, F., Han, D., Mattacola, C., Erlandson, E., Stowe, J., Gombeski Jr., W. Saddle Up Safely Guidelines for Return to Horse-Related Activities After Concussion. *5th International Consensus Conference on Concussion in Sport, Berlin, Germany*, October 2016.
- Camargo, F., Gombeski Jr., W., Barger, O., Jehlick, C., Wiemers, H., Lawyer, K.A., Mead, J. Prevention of Horse-Related Injuries: Where Education Efforts Should Be Focused. *Equine Science Society*, oral presentation, 2015.
- Camargo, FC; Lawyer, KA; Willis, CM; Bott, R. Comparative Analysis of State 4-H Horse Programs. American Society of Animal Science – Midwest Section, March 2014, Des Moines, IA.

Food Science Extension Publications

Fact Sheets

- Halich, G., J. Lehmkuhler, G. Rentfrow, F. Martz, R. Smith, and L. Meyer. 2016. Producer's guide to pasture-based beef finishing (reprint). ID-224.
- Vijayakumar, P.P., M. Newman, and G. Rentfrow. 2016. Foodborne Illness. ASC-227.
- Rentfrow, G. and S. Suman, 2014, How to make a country ham, UK Extension Publications ASC-213.
- Hutchens, T, G. Rentfrow, and K. Andres†. 2011. Marketing goat and lamb meat to Hispanic retail outlets. UK Extension Publications ASC-182.

Other Extension Publications

- Mikel B., M.C. Newman and Juan Silva. 2012. Servicios de Asesoramiento Agrícolas Orientados al Mercado: El Sistema de Universidades Agro Mecánicas de los EUA (Market Oriented Advisory Services: The U.S. Landgrant System). FAO Regional Meeting. Santa Cruz, Bolivia.
- Newman, M.C. and Mikel B. 2012. Utilizing HACCP principles in food processing. USAID/Iraq.

Book Chapter

- Hanson, D.J., G. Rentfrow, M.W. Schilling and W.B. Mikel. Ripened meat products, US products – Country Ham. 2104. Handbook of Fermented Meat Products, 2nd Ed. Wiley-Blackwell, F. Toldra, Editor.

Invited Paper

- Rentfrow, G., S.P. Suman, and R.T. Chaplin*. 2013. Salt penetration in dry cured hams. The National Provisioner. www.provisioneronline.com/articles/print/98699-salt-penetration-in-dry-cured-hams.
- Rentfrow, G., S.P. Suman, and R.T. Chaplin*. 2012. Technology of dry cured ham production; Science enhancing art. Anim. Front. 2(4):26-31.

Refereed Journal Articles

- Tomasz, L., G Rentfrow, and Y.L. Xiong. 2017. Polyphosphate and myofibrillar protein extract promote transglutaminase-mediated enhancements of rheological and textural properties of PSE pork meat batters. *Meat Science*, accepted, in-press.
- A. Higdon, M. Newman, R. Dwyer. Strengthening Community Agrosecurity Preparedness Instructor Guide (360 pages) and Participant Guide (310 pages). Reviewed and approved by US Department of Homeland Security. 2015.
- Suman, S.P., Hunt, M.C. Nair, M.N., and Rentfrow, G. 2014. Improving beef color stability: Practical strategies and underlying mechanisms. *Meat Sci* 98:490-504.
- Suman, S.P., Rentfrow, G., Nair, M.N., and Joseph, P. 2014. Proteomic of muscle and species specificity in meat color stability. *J. Anim. Sci.* 92:875-882.
- Canto, A.C.V.S., Suman, S.P., Nair M.N., Li, S., Rentfrow, G., Beach, C.M., Silva, T.J.P., Wheeler, T.L., Shackelford, S.D., Grayson, A., McKeith, R.O., and King, D.A., 2014. Differential abundance of sarcoplasmic proteome explains animal effect on beef Longissimus lumborum color stability. *Meat Sci*. Accepted in September 2014.
- Jiang, J., Y.L. Xiong, M.C. Newman, and G. Rentfrow. 2012. Structure-modifying alkaline and acidic pH-shifting processes promote film formation of soy proteins. *Food Chemistry*.
- Suman, S.P., P. Joseph, K.M. McClelland*, S. Li, G. Rentfrow, Y.L. Xiong. 2012. Ginger extract improves tenderness of beef whole-muscle Biceps femoris. *Fleischwirtschaft International*. 27(2012):57-61.

- Ma, Y.L., M.D. Lindemann, G.L. Cromwell, R.B. Cox*, and G. Rentfrow. 2012. Evaluation of trace mineral source and pre-slaughter deletion of those minerals on performance, carcass characteristics, and pork quality in pigs. *J. Anim. Sci.* 90:1-9.
- Wang, Y., Y.L. Xiong, M.C. Newman, and G. Rentfrow. 2012. Oxidation promotes cross-linking but impairs film-forming properties of whey protein. *J. Food Eng.*
- McClelland, K.M.*, G. Rentfrow, G.L. Cromwell, M.D. Lindemann, and M.J. Azain. 2012. Effects of corn distillers dried grains with solubles on quality traits of pork. *J. Anim. Sci.*
- Mikel B. and M.C. Newman. 2012. Meat Plant Sanitation. National Pork Board and the American Meat Science Association.
- Newman, M.C. and Mikel B. 2012. Pre-shipment Record Review Options for Small Processors. National Pork Board and the American Meat Science Association.
- Mikel B. and M.C. Newman. 2012. Global Perspective to Reducing Food Waste from Spoilage. American Meat Science Association RMC Proceedings. Fargo, ND.

Proceedings

- Canto, A. C. V. C. S., Suman S.P., Nair, M.N., Li, S., Rentfrow, G., Beach, C.M., Silva, T.J.P., Wheeler, T.L., Shackelford, S.D., Grayson, A., McKeith, R.O., and King, D.A. Proteome basis of animal effect on color stability of beef Longissimus lumborum steaks. In proceedings of 60th International Congress of Meat Science and Technology, August 2014, Punta Del Este, Uruguay. Paper # 163.

Educational Videos

- Gutless Field Dressing and Deer Carcass Fabrication, 2017, filmed with Ag Communications and the Kentucky Department of Fish and Wildlife, being edited.
- Lamb Carcass Fabrication, 2014, www.youtube.com/watch?v=2zV81-XQivU as of 8/21/2017 67,980 views.
- Pork Carcass Fabrication, 2014, <http://www.youtube.com/watch?v=7sVVqx8vvA0> as of 8/21/2017 100,585 views.
- How to make a country ham, 2014, <http://www.youtube.com/watch?v=qcwu6K4crHc> as of 8/21/2017 436,163 views.
- Beef Retail Fabrication, 2013, <http://www.youtube.com/watch?v=-PBGvoEFE74> as of 8/21/2017 410,865 views.

Poultry Extension Publications

Fact Sheets

- 4AJ-02PO – Kentucky 4-H chicken and turkey barbecue contests. A. Pescatore and J. Jacob.
- 4AJ-03PO – Kentucky 4-H Poultry: Barbecue contests. A. Pescatore and J. Jacob.
- 4AJ-04PO – Kentucky 4-H Poultry: Poultry judging contests. A. Pescatore and J. Jacob.
- 4AJ-06PO – Kentucky 4-H Poultry: Grading ready-to-cook poultry. A. Pescatore and J. Jacob.
- 4AJ-07PO – Kentucky 4-H Poultry: Evaluating egg-laying hens. A. Pescatore and J. Jacob.
- 4AJ-08PO – Kentucky 4-H Poultry: Giving oral reasons. A. Pescatore and J. Jacob.
- 4AJ-09PO – Kentucky 4-H Poultry: Egg preparation demonstration . A. Pescatore and J. Jacob.
- 4AJ-05PO - Poultry Judging: Grading Eggs. A. Pescatore and J. Jacob.
- ASC-189 - Making a Hoop Pen for Pasture Poultry. A. Pescatore and J. Jacob.
- ASC-190 - Selecting the Right Chicken Breed. A. Pescatore and J. Jacob.
- ASC-191 - How Much Will My Chickens Eat? A. Pescatore and J. Jacob.
- ASC-192 - Why Have My Hens Stopped Laying? A. Pescatore and J. Jacob.
- ASC-193 - Poultry Producer Liability. A. Pescatore and J. Jacob.
- ASC-194 - Poultry Production Troubleshooting. A. Pescatore and J. Jacob.
- ASC-195 - Development of the Chick. A. Pescatore and J. Jacob.

- 4AJ-05PO - Poultry Judging: Grading Eggs. A. Pescatore and J. Jacob.
- ASC-196 - Selecting the Right Breed of Goose. A. Pescatore and J. Jacob.
- ASC-197 - Selecting the Right Turkey Variety. A. Pescatore and J. Jacob.
- ASC-198 - Selecting the Right Breed of Duck. A. Pescatore and J. Jacob.
- ASC-199 - Avian Male Reproductive System. A. Pescatore and J. Jacob.
- ASC-200 - Avian Respiratory System. A. Pescatore and J. Jacob.
- ASC-201 - Avian Female Reproductive System. A. Pescatore and J. Jacob.
- ASC-202 - Avian Skeletal System. A. Pescatore and J. Jacob.
- ASC-203 - Avian Digestive System. A. Pescatore and J. Jacob.
- ASC-204 - Avian Muscular System. A. Pescatore and J. Jacob.
- ASC-206 - Common External Parasites of Poultry. A. Pescatore and J. Jacob.
- ASC-209 - Raising Guinea Fowl. A. Pescatore and J. Jacob.
- ASC-210 - Processing Chickens. A. Pescatore and J. Jacob.
- Pescatore, Anthony, Ricky Yeargan, and Andrea Husband. Understanding the differences between various types of flu. KY EDEN-JSK 301. Revised 2016
- Pescatore, Anthony, Ricky Yeargan, and Andrea Husband. Bird Flu- Biosecurity and Prevention. KY EDEN-JSK 313. Revised 2016
- Pescatore, Anthony, Ricky Yeargan, and Andrea Husband. Bird Flu- Information for hunters and taxidermist. KY EDEN-JSK 312. Revised 2016
- Pescatore, Anthony, Ricky Yeargan, and Andrea Husband. Bird Flu- Identification and Reporting. KY EDEN-JSK 314. Revised 2016
- Pescatore, Anthony, Ricky Yeargan, and Andrea Husband. Bird Flu- Considerations for pet and non-farm animals. KY EDEN-JSK 310. Revised 2016
- Pescatore, Anthony, Ricky Yeargan, and Andrea Husband. Bird Flu- Cleaning and Disinfection. KY EDEN-JSK 311. Revised 2016

Other Extension Publications

- Pescatore, A. J. Bird Management. IN Kentucky's Mobile Processing Unit Training and Use Manual. Ky's Mobile Processing Unit Management Team.
- Pescatore, A. J. Feed Withdrawal IN Kentucky's Mobile Processing Unit Training and Use Manual. Ky's Mobile Processing Unit Management Team.
- Pescatore, A. J. Evisceration and Inspection IN Kentucky's Mobile Processing Unit Training and Use Manual. Ky's Processing Unit Management Team.
- Poultry Producer Manual and archived copies of newsletter "Cheeps and Chirps" are published on our University of Kentucky website Poultryenergy.com.

Book Chapters

- Jacqueline Jacob and Anthony Pescatore 2012. Gut health and organic acids, antimicrobial peptides and botanicals as natural feed additives. Organic Meat Production and Processing. S. C, Ricke, E.J. Van Loo, M.G. Johnson, and C. A. O'Bryan. eds. Wiley-Blackwell. 351-378.
- Jacqueline Jacob and Anthony Pescatore 2012. Prebiotics. Organic Meat Production and Processing. S. C, Ricke, E.J. Van Loo, M.G. Johnson, and C. A. O'Bryan. eds. Wiley-Blackwell. 379-406.

Refereed Journal Articles

- Jacob, Jacqueline Jacob and Anthony Pescatore. 2017. Glucans and the poultry immune system. American Journal of Immunology. 13(1):45-49. <https://doi:10.3844/ajisp.2017.45.45.49>
- Adedokun, S.A., A. J. Pescatore, M. J. Ford, J. P. Jacob, and A. Helmbrecht. 2017. Examining the effect of dietary electrolyte balance, energy source, and length of feeding of nitrogen-free diets on ileal endogenous amino acid losses in broilers. Poultry Science. <https://doi.org/10.3382/ps/pex159>

- Mwangi, S, J. Timmons, T. Ao, M. Paul, L. Macalintal, A. Pescatore, A. Cantor, M. Ford, K. A. Dawson. 2017. Effect of zinc imprinting and replacing inorganic zinc with organic zinc on early performance of broiler chicks. *Poultry Science*, Volume 96, Issue 4, 1 April 2017, Pages 861–868, <https://doi.org/10.3382/ps/pew312>
- Mwangi, samuel; Timmons, Jennifer; Ao, Tuoying; Paul, Marquisha; Macalintal, Lizza; Pescatore, Anthony; Cantor, Austin H.; Dawson, Karl A. 2017. Effect of manganese imprinting and replacing inorganic manganese with organic manganese on performance of male broiler chicks. *Poultry Science*, Volume 96, In Press.
- Ao, T, L. M. Macalintal, M. A. Paul, A. J. Pescatore, A. H. Cantor, M. J. Ford,
- B. Timmons, and K. A. Dawson, 2015. Effects of supplementing microalgae in laying hen diets on productive performance, fatty-acid profile, and oxidative stability of eggs. *J. Appl. Poult. Res.* 00:1–7. <http://dx.doi.org/10.3382/japr/pfv042>
- Brennan, K.M., R S Samuel, D E Graunard, T Ao, R Xiao, A H Cantor, A J Pescatore. 2013. Organic Trace Mineral Levels in the First 96-H Post-Hatch Impact Growth Performance and Intestinal Gene Expression in Broiler Chicks. *Biological trace element research.* 09/2013; DOI:10.1007/s12011-013-9813-6
- Steffanie V. Burk, Mary G. Rossano, William J. Silvia, Eric S. Vanzant, Anthony J. Pescatore, and Robert J. Harmon. 2013. Factors Associated with Course Withdrawal and Final Course Grade in an Introductory Animal Science Course. *NACTA Journal* 57.2: 16-23
- Xiao , R., R. F. Power, D. Mallonee , K. Routt , L. Spangler , A. J. Pescatore, A. H. Cantor, T. Ao, J. L. Pierce, and K. A. Dawson. 2012. Effects of yeast cell wall-derived mannan-oligosacchrides on jejuna gene expression in young broiler chickens. *Poultry Sci.* 91: 1660-1669.
- Quant, A.D., A.J. Pescatore, A.H. Cantor, M.J. Ford, J.M. Urine and J.L. Pierce. 2012. Effects of selenium yeast (Sel-Plex) and vitamin E concentration on tissue selenium concentration of developing broiler breeder pullets. *World's Poultry Sci Journal (Supplement 1)* 159-161.
- Jacob, J., and A.J. Pescatore. 2012. Using barley in poultry diets - A review. *J. Appl. Poultry Res.* 21.21. 915-940
- Ao, T., J.L. Pierce, A.J. Pescatore, A.H. Cantor, K.A. Dawson, M.J. Ford and M. Paul. 2011. Effects of feeding different concentrations and forms of zinc on the performance and tissue mineral status of broiler chicks. *Brit. Poultry Sci.* 52(4):466-471.
- Brennan, K.M. ,C.A. Crowdus, A.H. Cantor, A.J. Pescatore, J.L. Barger, K. Horgan,R. Xiao, R.F. Power, K.A. Dawson. 2011. Effects of organic and inorganic dietary selenium supplementation on gene expression profiles in oviduct tissue from broiler-breeder hens. *Anim. Repro. Sci.* doi:10.1016/j.anireprosci.2011.02.027.

Sheep Extension Publications

Fact Sheets

- D.G. Ely and D.K. Aaron. 2017. Body Condition Scoring Ewes. ASC-228.
- D.K. Aaron. 2014. Crossbreeding Considerations in Sheep. ASC-224.
- D.K. Aaron. 2014. Inbreeding in Sheep. ASC-223.
- D.K. Aaron. 2014. Sheep Breeding: Heritability, EBVs, EPDs and the NSIP. ASC-222.
- D.K. Aaron. 2014. Keeping and Using Flock Performance Records. ASC-221.
- D.K. Aaron. 2014. Basic Sheep Genetics. ASC-220.
- D.G. Ely and D.K. Aaron. 2014. An Introduction to Sheep. ASC-219.
- D.G. Ely and E. Fink. 2014. Is Creep Feeding Lambs a Profitable Undertaking?. ASC-214.

Swine Extension Publications

Other Extension Publications

- Coffey, R.D. 2014. Porcine Epidemic Diarrhea Virus (PEDV) and its Potential Impact on Youth Swine Projects.

- Coffey, R.D. 2014. 2014 Ownership, Possession, and Care Rules for Kentucky 4-H/FFA Youth Breeding, Market, and Dairy Animal Projects.
- Coffey, R.D. 2014. 2014 Guidelines for Validating 4-H/FFA Market Steers, Market Heifers, Market Lambs, Market Hogs, and Market Goats in Kentucky.
- Coffey, R. 2014. 2014 Resource Packet for Kentucky 4-H Livestock Skillathon Contest.
- Coffey, R.D. 2013. 2013 Ownership, Possession, and Care Rules for Kentucky 4-H/FFA Youth Breeding, Market, and Dairy Animal Projects.
- Coffey, R.D. and J. P'Pool. 2013. 2013 Guidelines for Validating 4-H/FFA Market Steers, Market Heifers, Market Lambs, Market Hogs, and Market Goats in Kentucky.
- Coffey, R. and J. P'Pool. 2013. 2013 Resource Packet for Kentucky 4-H Livestock Skillathon Contest.
- Coffey, R.D. 2012. Kentucky 4-H Livestock/Horse Volunteer Certification Program Guidelines.
- Coffey, R.D. 2012. 2012 Ownership, Possession, and Care Rules for Kentucky 4-H/FFA Youth Breeding, Market, and Dairy Animal Projects.
- Coffey, R.D. 2012. 2012 Guidelines for Validating 4-H/FFA Market Steers, Market Heifers, Market Lambs, Market Hogs, and Market Goats in Kentucky.
- Coffey, R. and J. P'Pool. 2012. 2012 Resource Packet for Kentucky 4-H Livestock Skillathon Contest.
- Coffey, R.D. 2011. 2011 Ownership, Possession, and Care Rules for Kentucky 4-H/FFA Youth Breeding, Market, and Dairy Animal Projects.
- Coffey, R.D. 2011. 2011 Guidelines for Validating 4-H/FFA Market Steers, Market Heifers, Market Lambs, Market Hogs, and Market Goats in Kentucky.
- Coffey, R. and J. P'Pool. 2011. 2011 Resource Packet for Kentucky 4-H Livestock Skillathon Contest.

Annual Reports

- R. Coffey. 2016. The Kentucky Agricultural Experiment Station 128th Annual Report. *Responsible for compiling all research efforts for faculty and staff from Department of Animal and Food Sciences for the report.*
- R. Coffey. 2015. The Kentucky Agricultural Experiment Station 127th Annual Report. *Responsible for compiling all research efforts for faculty and staff from Department of Animal and Food Sciences for the report.*
- R. Coffey. 2014. The Kentucky Agricultural Experiment Station 126th Annual Report. *Responsible for compiling all research efforts for faculty and staff from UKREC for the report.*
- R. Coffey. 2013. The Kentucky Agricultural Experiment Station 125th Annual Report. *Responsible for compiling all research efforts for faculty and staff from UKREC for the report.*

Electronic Resource

- KY 4-H LIVESTOCK VOLUNTEER CERTIFICATION RESOURCE MANUALS USB FLASH DRIVE (2013) – a flash drive that is programmed with a user friendly interface to allow Certified Volunteer Leaders to easily access electronic versions of lesson plans and learning resources in each of the seven curriculum manuals (Beef Cattle, Sheep, Swine, Goat, Dairy Cattle, Country Ham, and All-Species).

Web Sites

- UK RESEARCH AND EDUCATION CENTER WEB SITE (2013) – a complete redesign of the center's web site [<http://wkrec.ca.uky.edu/>].
- ANIMAL AND FOOD SCIENCES 4-H AND YOUTH WEB SITE (2012) – a complete redesign of the departmental 4-H and youth web site. New site contains information on Calendar of

Events, Livestock Projects (beef, goats, sheep, swine), Market Animal Validation Program, Ownership-Possession-Care Guidelines for Livestock Projects, Livestock Judging, Livestock Skillathon, KY 4-H Livestock Volunteer Certification Program, Publications, and Policies-Rules-Guidelines [<http://afs4hyouth.ca.uky.edu/>].

Proceedings

- Bolster, C.H., R.D. Coffey, S. Coleman, P. Goodman, S.F. Higgins, T. Horvath, B. Lee, C. Renfro, E.L. Ritchey, R. Smallwood, J. Sanders, S. Melhope, and K. Woodrich. 2013. Development and Testing of a Revised Phosphorus Index for Kentucky. Kentucky Water Resources Research Institute Symposium. Lexington, KY.

Appendix KK

Statistical Contacts for
AFS Extension Faculty
and Staff

APPENDIX KK - Statistical Contacts for AFS Extension Faculty and Staff

Statistical Contacts: Animal and Food Sciences																			
Number Employees Reporting	Faculty	Staff	Days Reported	Days Multi-State	Total Contacts	Female	Male	Youth	Volunteers	Indirect	Total Contacts	White	Black	Asian/Pacific Islander	American Indian or Alaska Native	Other	Could not be determined	Hispanic	
FY2017	20	14	6	4,036.30	887.30	62,899	24,937	37,962	11,670	6,259	2,322,165	62,899	44,245	1,001	293	9	2,145	15,206	2,455
FY2016	22	16	6	4,186.70	776.70	71,501	27,202	44,299	11,553	5,886	2,315,645	71,501	56,657	1,270	414	17	98	13,045	829
FY2015	15	10	5	3,081.25	574.00	52,767	15,914	36,853	8,413	1,357	1,666,736	52,767	40,292	964	474	5	1	11,031	375
FY2014	18	12	6	4,411.50	412.00	71,347	23,371	47,976	13,746	3,605	790,043	71,347	55,194	1,133	283	3	107	14,627	433
FY2013*	18	12	6	4,012.50	500.50	93,980	41,726	52,254	26,480	7,193	344,313	93,980	81,469	1,330	447	5	125	10,604	865
FY2012	18	12	6	3,728.50	211.50	78,832	14,606	64,226	18,377			78,832	58,294	1,179	730	6	18,021	602	
FY2011	21	13	8	4,723.50	0.00	115,997	18,437	97,560	17,233			115,997	63,916	909	201	1	50,615	355	
Totals:				28,180.25	3,362.00	547,323	166,193	381,130	107,472	24,300	7,438,902	547,323	400,067	7,786	2,842	46	71,112	64,513	5,914

Appendix LL

Impact Statements for AFS Extension Faculty and Staff

APPENDIX LL

Impact Statements for Animal and Food Science Extension Faculty and Staff

Fiscal Year 2011 (24 Total Statements)

Title

DAIReXNET- National Dairy Extension Web Resources
Dairy Extension Programs Related to Nutrition and Management
Master Grazer
Compost Bedded Pack Barns in Kentucky
Extension Programming in Kentucky to Address Somatic Cell
Count Challenges
Freestall Barn Renovations
Precision Dairy Farming Applied Research and Outreach
Beef Genetics Improvement Plan
National Beef Cattle Evaluation Consortium
Kentucky Equine Youth Festival
Adobe Connect Sheep and Goat Educational Program
Kentucky Cheese Making School
Vegetation Management through Goat Management
Small and Backyard Poultry Flocks
Dairy Farm Business Management, Genetics and
DHI Dairy Records
Kentucky 4-H All-Star Livestock Judging Team
Expansion of Processing Options for Small Producers
4-H Country Ham Project
4-H State Meats Judging Contest
Food Defense/Security
Food Systems Innovation Center
Hazard Analysis Critical Control Points (HACCP)
University of Kentucky Meat Cutting School

Extension Professional

Amaral-Phillips, Donna M.
Amaral-Phillips, Donna M.
Amaral-Phillips, Donna M.
Bewley, Jeffrey M.
Bewley, Jeffrey M.
Bewley, Jeffrey M.
Bullock, Darrh
Bullock, Darrh
Camargo, Fernanda C
Hutchens, Terry K.
Hutchens, Terry K.
Hutchens, Terry K.
Jacobs, Jacquie

McAllister, Alan J.
P'Pool, Jason R.
Pescatore, Anthony J.
Rentfrow, Gregg
Rentfrow, Gregg
Rentfrow, Gregg
Rentfrow, Gregg
Rentfrow, Gregg
Rentfrow, Gregg
Rentfrow, Gregg

Fiscal Year 2012 (13 Total Statements)

Title

DAIReXNET—National Dairy Extension Web Resource
Dairy Extension Programs
Master Grazer Educational Program-State Perspective
Basic Horse Handling Workshop and Clinic
Horse Volunteer Certification Program
Kentucky 4-H Horse Program
Kentucky 4-H Volunteer Forum: Horse Track
Horse College
Inaugural Equine Field Day in Western Kentucky
Small and Backyard Poultry Website
Kentucky Master Stocker Program
Kentucky 4-H All-Star Livestock Judging Team
Use of Distiller's Dried Grain with Solubles in Laying Hen Diets

Extension Professional

Amaral-Phillips, Donna M.
Amaral-Phillips, Donna M.
Amaral-Phillips, Donna M.
Camargo, Fernanda C.
Camargo, Fernanda C.
Camargo, Fernanda C.
Camargo, Fernanda C.
Camargo, Fernanda C.
Coleman, Robert C.
Coleman, Robert C.
Jacob, Jacquie
Lehmkuhler, Jeff
P'Pool, Jaron R.
Pescatore, Anthony J.

Fiscal Year 2013 (13 Total Statements)

Title

M.I.L.K. (Market Incentive Leadership for Kentucky) Counts
Horses Body Condition Scoring
Development and Evaluation of Within-Facility Swine
Manure Composting
PQA Plus Program
Wranglers Equine Day
Involvement with the Kentucky FFA program
Addressing the Needs of the Growing Number of
Urban Homes Raising Chickens
UK Beef Cow Forage Supplement Tool
Comparison of Coproduct Feed Blend for Beef Calves
Insecticide Tags for Fly Control on Beef Cattle
Mid-South Stocker Conference
Success of the Kentucky 4-H All-Star Livestock Judging Team
Kentucky's Mobile Processing Unit for
Small Livestock Species (MPU)

Extension Professional

Bewley, Jeffrey M.
Camargo, Fernanda C.

Coffey, Richard D.
Coffey, Richard D.
Coleman, Robert J.
Heersche, George

Jacob, Jacqueline P.
Laurent, Kevin M.
Lehmkuhler, Jeffrey W.
Lehmkuhler, Jeffrey W.
Lehmkuhler, Jeffrey W.
P'Pool, Jason R.

Pescatore, Anthony J.

Fiscal Year 2014 (13 Total Statements)

Title

Compost Bedded Pack Barn Extension and
Research Programming
Cattle Handling and Care Certification Program
Kentucky 4-H Horse Program
Kentucky 4-H Volunteer Forum – Horse Track
Show Horse Unable to Maintain Weight
The healthy horse app
Western Kentucky Field Day
County 4-H Chicken Barbecue Camps
eXtension Material for Small and Backyard Poultry Flocks
KY Beef Quality Assurance Program
Kentucky Master Stocker
Mid-South Stocker Conference
Training for General Practice Veterinarians on Avian Species

Extension Professional

Bewley, Jeffrey M.
Bullock, Kevin D.
Camargo, Fernanda C.
Camargo, Fernanda C.
Camargo, Fernanda C.
Coleman, Robert J.
Coleman, Robert J.
Jacob, Jacqueline P.
Jacob, Jacqueline P.
Laurent, Kevin M.
Lehmkuhler, Jeffrey W.
Lehmkuhler, Jeffrey W.
Pescatore, Anthony J.

Fiscal Year 2015 (27 Total Statements)

Title

DAIReXNET – Multi-State Online Resource for
Quality Information
Impact of the Center of KY Dairy Shortcourse
Master Grazer-Graze 300 Educational Program
Changing Genetics To Meet the Environment
Controlling the Calving Season
Enhancing Reproductive Performance
Enhancing Reproductive Performance

Extension Professional

Amaral-Phillips, Donna M.
Amaral-Phillips, Donna M.
Amaral-Phillips, Donna M.
Anderson, Leslie H.
Anderson, Leslie H.
Anderson, Leslie H.
Anderson, Leslie H.

Enhancing Reproductive Performance
 Long-Term Impact of Estrus Synchronization and AI
 Long-Term Impact of Estrus Synchronization and AI
 Kentucky State 4-H Livestock Contest
 Kentucky State 4-H Skillathon Contest
 Top 12 week 2015
 Healthy Horse in the APP
 Horse College on Lync
 Spencer County 4-H and FFA Dairy Evaluation
 Collaboration with County Agents in Poultry Programing
 Reaching a Nationwide Audience with eXtension Webinars
 Integrating Crop Ground into the Grazing System
 Beef Efficiency Conference
 Managing Beef Cattle in Confinement Conference
 Profitable and Sustainable Poultry Production on Small
 and Medium Sized Farms
 Spicy Fat Cat
 The Chop Shop
 UK Butcher Shop
 Food Safety Regulations for Small Business in Kentucky
 Helping Food Businesses Sell Canned Food Products
 According to Federal Regulations

Anderson, Leslie H.
 Anderson, Leslie H.
 Anderson, Leslie H.
 Austin, Steven L.
 Austin, Steven L.
 Austin, Steven L.
 Austin, Steven L.
 Coleman, Robert J.
 Coleman, Robert J.
 Heersche, George
 Jacob, Jacqueline P.
 Jacob, Jacqueline P.
 Laurent, Kevin M.
 Lehmkuhler, Jeffrey W.
 Lehmkuhler, Jeffrey W.

 Pescatore, Anthony J.
 Rentfrow, Gregg K.
 Rentfrow, Gregg K.
 Rentfrow, Gregg K.
 Vijayakumar, Paul Priyesh

 Vijayakumar, Paul Priyesh

Fiscal Year 2016 (47 Total Statements)

Title

DAIReXNET – National Extension Program Impact
 Specialist Programs in Addition to Clientele
 Dairy Family Dynamics Critical in Successful
 Dairy Farm Business
 Changing Genetics to Match the Environment
 Eastern Kentucky IRM Program Helps Cattlemen Establish
 a Controlled Calving Season
 Eastern Kentucky IRM Program Helps Cattlemen Reduce
 the Length of the Calving Season
 Eastern Kentucky IRM Program Stimulates Dramatic
 Changes in Productivity for Cattleman
 Long-Term Impact of Estrus Synchronization
 and AI in Beef Cow-Calf Operations
 Livestock Judging Reaches Far Beyond Looking Animals
 Southeast Quality Milk Initiative
 Beef Cattle Handling and Care
 Extension Educational Program Utilizing
 UK Students as Educators
 Pasture to Plate Program
 Reproductive Management Program
 Master Cattlemen Program

Extension Professional

Amaral-Phillips, Donna M.

 Amaral-Phillips, Donna M.
 Anderson, Leslie H.

 Anderson, Leslie H.

 Anderson, Leslie H.

 Anderson, Leslie H.
 Austin, Steven L.
 Bewley, Jeffrey M.
 Bullock, Darrh

 Bullock, Darrh
 Bullock, Darrh
 Bullock, Darrh
 Burris, Walter R.

Kentucky 4H Volunteer Forum – Horse Track	Camargo, Fernanda C.
Horse Judging Clinic	Camargo, Fernanda C.
Kentucky 4-H Horse Program	Camargo, Fernanda C.
Beginning Farmer and Diversification Through Entrepreneurship Loan (DEAL) Program	Coleman, Robert J.
Healthy Horse App	Coleman, Robert J.
Small Ruminant Profit Schools	Ely, Donald G.
Assist a Research Facility in Canada	Heersche, George
Cooperation between 4-H and FFA in Dairy Judging	Heersche, George
Saving a Valuable Cow	Heersche, George
4-H Chicken Barbecue	Jacob, Jacqueline P.
Ask –an-Expert	Jacob, Jacqueline P.
eXtension’s Small and Backyard Flocks	Jacob, Jacqueline P.
Using Balanced Rations in Beef Cattle Nutrition	Laurent, Kevin M.
2016 Horse Judging Clinic	Lawyer, Katherine A.
Kentucky Beef Efficiency Conference	Lehmkuhler, Jeffrey W.
Mid-South Stocker Conference Continues to Provide Economic Benefits to Stocker Industry	Lehmkuhler, Jeffrey W.
Warm-Season Annual Forages Fill a Gap	Lehmkuhler, Jeffrey W.
DAIREXNET-National Extension Resource with Broad Reach and Use	McGill, Nancy L.
FSIC Assists Kentucky’s Food Industry	Newman, Melissa C.
Highly Pathogenic Avian Influenza (HPAI) Forum and Preparedness Meeting	Pescatore, Anthony J.
4-H Country Ham Project	Rentfrow, Gregg K.
Adult Country Ham Contest	Rentfrow, Gregg K.
All About Meats	Rentfrow, Gregg K.
Delaware State University Mobile Processing Unit	Rentfrow, Gregg K.
Pork Processing Workshop – UK Meat Cutting School	Rentfrow, Gregg K.
Trackside Butcher Shoppe	Rentfrow, Gregg K.
Dare to Dairy	Tucker, Larissa L.
Better Process Control School for Small to Medium Sized Food Processors and Food Companies	Vijayakumar, Paul Priyesh
Certifying Food Processors in HACCP, a Cost Effective Food Safety Systems	Vijayakumar, Paul Priyesh
FDA’s Food Safety Modernization Act Preventive Controls Qualified Individual Certificates	Vijayakumar, Paul Priyesh
GAP Audit and FSMA Overview Training Program for Growers and Extension Agents	Vijayakumar, Paul Priyesh
Helping Food Businesses Sell Thermally Processed Canned Food Products	Vijayakumar, Paul Priyesh
Process Based Food Safety Certification Programs: Hazard Analysis Critical Control Points	Vijayakumar, Paul Priyesh

Fiscal Year 2017 (46 Total Statements)

Title

Center of Kentucky Dairy Showcase	Extension Professional Amaral-Phillips, Donna M.
Long-Term Impact of Using Estrus Synchronization and AI in Beef Cow-Calf Operations	Anderson, Leslie H.
Matching Genetics to Marketing System Increases Profitability	Anderson, Leslie H.
Relationships Between Producer Characteristics and Production Practices	Anderson, Leslie H.
Shortening the Calving Season Dramatically Increases Beef Cow-Calf Productivity I	Anderson, Leslie H.
Shortening the Calving Season Dramatically Increases Beef Cow-Calf Productivity II	Anderson, Leslie H.
The UK IRM Farm Program Stimulates Dramatic Changes in Productivity for Cattlemen	Anderson, Leslie H.
All American at the National Livestock Judging Contest	Austin, Steven L.
Kentucky 4-H Skillathon Team Wins National Contest	Austin, Steven L.
Scholarships awarded	Austin, Steven L.
Skillathon Growth	Austin, Steven L.
To Make the Best Better	Austin, Steven L.
Southeast Quality Milk-Adair County	Bewley, Jeffrey M.
Applied Master Cattlemen Program – Advancements in Bull Selection	Bullock, Darrh
Cattle Genetic Improvement Program	Bullock, Darrh
Master Cattleman Program – Genetic Improvement	Bullock, Darrh
Equine Wellness Clinics	Camargo, Fernanda C.
Farm and Facility Design	Coleman, Robert J.
The Healthy Horse App	Coleman, Robert J.
Equine Biosecurity	Dwyer, Roberta M.
State-level Animal Disaster Response	Dwyer, Roberta M.
From Wool to Hair	Ely, Donald G.
4-H and FFA Cooperation	Heersche, George
eXtension Poultry-related Webinars	Jacob, Jacqueline P.
Cover Crop Grazing Demonstration and Workshop	Laurent, Kevin M.
Horse Educational Videos	Lawyer, Katherine A.
Horse Wellness Clinics	Lawyer, Katherine A.
Kentucky Beef Efficiency Conference	Lehmkuhler, Jeffrey W.
Pasture Nitrogen Fertilizer	Lehmkuhler, Jeffrey W.
DAIREXNET-Reach	McGill, Nancy L.
Disaster preparedness for pets, livestock, captive wildlife and Laboratory Animals	Newman, Melissa C.
Food Safety in RTE meats	Newman, Melissa C.
Injecting Science Based Information into Emotion Driven Consumer Decisions	Pescatore, Anthony J.
Country Ham - Adult	Rentfrow, Gregg K.
Deer Hunter Safety	Rentfrow, Gregg K.
Kentucky Association of Meat Processors	Rentfrow, Gregg K.

Pasture to Plate – End Product	Rentfrow, Gregg K.
Pasture to Plate – End Product for FCS agents	Rentfrow, Gregg K.
UK Meat Cutting School – Cutting Demonstrations	Rentfrow, Gregg K.
UK Meat Cutting School – Maine & New Hampshire	Rentfrow, Gregg K.
Dairy U: Know Before You Show Clinic	Tucker, Larissa L.
Better Process Control School Certification for Kentucky Processors	Vijayakumar, Paul Priyesh
Certifying Food Processors in HACCP, a Cost Effective Food Safety System	Vijayakumar, Paul Priyesh
FMSA Training and Certification for Regulators from Kentucky Department of Public Health	Vijayakumar, Paul Priyesh
Helping Food Businesses Sell Thermally Processed Canned Food Products	Vijayakumar, Paul Priyesh

DEPARTMENT OF ANIMAL AND FOOD SCIENCES

College of Agriculture, Food and Environment
University of Kentucky

Periodic Departmental Review
Conducted-October 15-18, 2017

Final Report
Submitted – November 3, 2017

Programs Reviewed:

Bachelor of Science in Animal Sciences
Bachelor of Science in Food Science
Master of Science in Animal and Food Sciences
Doctoral Degree in Animal and Food Sciences

Review Committee:

Dr. Darrell Johnson, Committee Chair – Executive Director UK
Division of Regulatory Services
Mr. Jim Akers, Alumnus, Chief Operating Officer of Bluegrass Stockyards
and General Manager of Bluegrass Regional Marketplace
Mr. Rob Amburgey, Bath County Extension Agent
for Agriculture and Natural Resources
Dr. Brad Anderson, Professor and former Department Chair
Pharmaceutical Sciences Department, UK College of Pharmacy
Dr. David Gerrard, Department Head and Professor
Department of Animal and Poultry Sciences, Virginia Tech
Dr. Kristen Johnson, Interim Chair and Professor
Department of Animal Sciences, Washington State University
Ms. Amy Lawyer, Equine Extension Associate
Department of Animal and Food Sciences, University of Kentucky
Mr. Derek Nolan, Ph.D. Candidate
Department of Animal and Food Sciences, University of Kentucky
Dr. Surendranath Suman, Professor of Meat Science
Department of Animal and Food Sciences, University of Kentucky

I. Review Process

1. Members of the review team were provided with the Animal and Food Sciences self-study document (http://administration.ca.uky.edu/files/afs_self-study_document_with_appendices_2017.pdf).
2. The review team met with Dr. Richard Coffey, Chair of the Animal and Food Sciences Department (AFS), for dinner on Sunday, October 15, 2017.
3. On Monday, October 16, the committee met with Dean Nancy Cox and the Assistant Dean for Academic Administration Lisa Collins to receive their charge. The charge to the committee was to:
 - a. Examine the self-study report;
 - b. Confirm the validity of the report's conclusions based on interviews with appropriate parties;
 - c. Engage in additional information seeking, as necessary;
 - d. Identify additional strengths and recommendations for quality enhancement; and
 - e. Prepare a written report that briefly describes the committee's process and provides a data-driven rationale for each strength and recommendation identified.
4. The committee met with the Associate Deans for Research, Extension, Instruction and Administration to gather information for our review.
5. Tours of on-campus and farm facilities related to the department were provided. Farm staff from both the local farms and the Research and Education Center at Princeton met with the committee during these tours.
6. The committee met with faculty, staff, undergraduate and graduate students. In addition, they had a dinner meeting with department stakeholders.
7. On the final day of the site-visit, the committee met with directors of undergraduate and graduate studies, academic coordinators, philanthropy staff and additional staff. A conference call was scheduled with county extension agents but none were available, but the committee reviewed results from a survey to which they had responded earlier.
8. A preliminary report was presented to the deans to close the visit on October 18, 2017.
9. The full site visit agenda is attached to this report.

II. External Review Committee Observations

1. Administrative Leadership

- a. Strengths
 - i. Highly respected and effective leadership exists at both the department and college levels.

- ii. Appointing an associate department chair has helped with operational efficiency.
- iii. A business officer from the college being designated for the department has improved business procedures.
- iv. On the college level, philanthropy went from 5-7 million to 26 million with the addition of a philanthropy director.
- b. Challenges, opportunities, and areas for improvement
 - i. Many faculty and staff in the equine science and management group are unclear of the role of the new Director of Equine Programs and want to remain part of Animal and Food Sciences. A clarification of organizational structure and reporting lines is also in order.
 - ii. There is a need to establish benchmarks against peer institutions to assess how the department compares currently, and determine areas with greatest capacity for improvement.
 - iii. A need for more support in managing grants was expressed.

2. Research Programs

- a. Strengths
 - i. Some state of the art animal research facilities (swine, sheep, and beef)
 - ii. Highly impactful research interactions with the USDA Agricultural Research Service (ARS) Forages Laboratory and personnel.
 - iii. Good cross disciplinary collaborations within the department (including the superfund research effort)
 - iv. Important asset in the Princeton research station.
 - v. Dedicated and talented support staff at the farms and in the labs.
- b. Challenges, opportunities, and areas for improvement
 - i. Department has maintained a strong research program despite a net reduction in research full-time equivalent (FTE) of 1.61 since the last review. Additional faculty having the potential to develop strong research programs should be recruited as funds allow.
 - ii. As discussed further in the facilities section of this report, limitations at the dairy facility, equine farm unit, and in the research labs make it difficult to recruit and retain new faculty.
 - iii. Beef research at Princeton needs to maintain its presence as the unit transforms into the Grain and Forage Center of Excellence.
 - iv. Additional support to research faculty is needed for managing grants.

- v. Some stakeholders expressed concerns over the amount of money that goes towards university overhead (facilities and administrative costs) from research grants.

3. Extension Programs

a. Strengths

- i. The Department has a strong animal science extension program.
- ii. Current administration has elevated the role of food science extension. Food Science Extension appears to have a great working relationship with industry.
- iii. County extension personnel indicated a good working relationship with the state specialists.
- iv. Stakeholders are appreciative of the role AFS extension has played in bettering their lives.

b. Challenges, opportunities, and areas for improvement

- i. Reductions in faculty numbers have required extension personnel to take on additional teaching responsibilities since the last review. This plus budget constraints that have reduced extension faculty lines have reduced the FTE level devoted to extension work.
- ii. Funding at both the state and federal levels for extension continue to decline. Agriculture Development Funds have been very beneficial to continued programming, but may not be around forever. Extension specialists should be encouraged to seek sustainable funding, keeping in mind that stakeholders need to feel they are receiving impartial information.
- iii. Stakeholders and specialists are especially concerned over the loss of the swine extension position (Dr. Coffey's position), the impending loss of a beef specialist position (Dr. Burris retirement), and the need to have a small ruminant extension position when Dr. Ely retires. The department is encouraged to place a high priority on identifying highly qualified faculty to fill these vacancies to ensure the long-term viability of the positions.

4. Academic Programs

a. Strengths

- i. Excellent undergraduate program and academic coordinators.
- ii. The undergraduate and graduate students we met were high caliber and very engaging. They were very positive about the college and the family atmosphere in the department.
- iii. Graduate student numbers have been maintained despite research FTE decline.
- iv. Undergraduate student retention and graduation rates are good.

- v. Undergraduate enrollment has increased 67% since the last review.
 - vi. Excellent scholarship opportunities for undergraduates.
 - vii. Department is home to the only nationally accredited food science program in the state of Kentucky.
 - viii. Excellent opportunities for extracurricular agriculture related activities.
- b. Challenges, opportunities, and areas for improvement
- i. Increasing enrollment is making it difficult to provide adequate classroom and laboratory space.
 - ii. Availability of hands on experiences for students is limited by the travel distance to C. Oran Little Research Center and the university course fee cap. The maximum course fees AFS may charge are insufficient to keep up with increasing laboratory and transportation costs.
 - iii. An on-campus multi-use livestock teaching/event facility would greatly enhance the program.
 - iv. The department needs to determine the facility and resource needs to create a dynamic and sustainable undergraduate and graduate food science program.
 - v. The department needs to look at ways to enhance undergraduate and graduate experiential learning. This was strongly supported by stakeholders.
 - vi. Graduate students expressed a desire to have more teaching opportunities and more class offerings outside of nutrition (e.g., grant writing and current issues in agriculture).
 - vii. Distance learning is an area that needs further study. This could offer an income stream and be beneficial to extension agents seeking continuing education.

5. Facilities

- a. Strengths
- i. Beef, sheep and swine units at the C. Oran Little research facility are excellent.
 - ii. State of the art feed mill contributes to the needs of the college.
 - iii. Research facilities at Princeton contribute to the college in a part of the state that is a significant distance from the main campus.
 - iv. Excellent new bedded pack barn at the dairy, excellent milking equipment and other technology to monitor the dairy herd.
- b. Challenges, opportunities and areas for improvement
- i. While the dairy has excellent milking equipment, the parlor is severely outdated, exhibiting 1965 technologies, and needs to be

replaced or modernized. Animal handling facilities also need to be improved for both animal and worker safety. Safety (for people and animals) was mentioned in several meetings and this issue needs immediate attention.

- ii. There are also needs to improve/expand the equine unit and swine teaching barn.
- iii. Concern was expressed by staff and stakeholders over maintenance of the units. There needs to be a maintenance plan developed now so that showcase facilities remain points of pride for the department and the college.
- iv. We would be remiss if we did not acknowledge the limiting nature of the building in which the department resides. The facilities are a detriment to faculty and staff productivity, as well as undergraduate and graduate recruiting. The building design also affects the culture of the department and does not promote communication, collaboration, and intellectual interactions. For example, temperature control of labs and offices affect research functionality and personal comfort. For the UK Animal and Food Sciences Department to remain competitive among animal science departments in the future, attention must be paid to the Garrigus building.
 1. There is a need for larger teaching labs to accommodate larger classes.
 2. The deteriorating conditions of the building likely disadvantage UK in its efforts to recruit new faculty and students who are considering other programs with more modern facilities.
 3. Although there are significant opportunities for growth in the food science program, progress is limited by the current facilities. In particular, a pilot lab for manufacturing/food processing has been cited by the faculty as a critical need.
 4. Safety issues and damage to instrumentation from leaks may become increasingly problematic as the air handling systems, HVAC, and plumbing systems further deteriorate.

III. Executive Summary and Review Committee Suggestions

The University of Kentucky and College of Agriculture, Food and Environment should be proud of the faculty, staff, and students of the Department of Animal and Food Sciences and their

accomplishments. The dedicated faculty and staff strive for excellence in all their work and are committed to the land grant mission. We believe significant strengths of the department include:

- Highly respected and effective leadership team, both at the department and college levels
- Dynamic, highly qualified, and collegial faculty across all three missions. Mutual respect appears to be the norm for this group
- High quality office staff dedicated to the department and their people
- Dedicated staff support (technical, academic, and extension)
- High caliber undergraduate and graduate students
- Excellent undergraduate program and academic coordinators
- Highly impactful research interactions with the USDA ARS Forages Laboratory personnel and obvious cross disciplinary collaborations within AFS (including the Superfund)
- Some state of the art animal facilities (swine, sheep and beef)
- Great ‘opportunity’ and asset in the Superfund Program
- Industry partnerships, excellent relationships with a passionate and committed stakeholder group
- Important asset in the Princeton research station. The presence of AFS in Western Kentucky, the unique research resources, and the importance of the work conducted there to the beef industry are strengths
- Extensive and high-quality youth programming that facilitates recruiting of high quality undergraduates

While the aforementioned reflects well on the department and the University of Kentucky, below are a few suggestions the review committee believes may help the department move the next level of excellence. They include in no particular order:

1. Establish a long-term faculty hiring plan that grows the research capabilities of the department.

Opportunities:

- a. increases exposure
- b. potential linkages with medical school
- c. positioning for federal funding

Challenges:

- a. resistance to change traditions
- b. perception of diluting historical positions

2. Prioritize the hiring and retention of beef, swine and small ruminant extension specialist positions.

Opportunities:

- a. continuity of long-lasting, quality programs
- b. stakeholder buy-in
- c. important agronomic commodities
- d. excellent facilities (outlying stations and local facilities)

Challenges:

- a. faculty line availability
- b. competition for emerging areas of interest
- c. identifying a uniquely qualified applicant; particularly for the small ruminant

position

3. Develop appropriate benchmarking against peer institutions.

Opportunities:

- a. Improve faculty and administration understanding of comparative performance
- b. provision of objective data to argue for additional resources
- c. increased efficiency

Challenges:

- a. time commitments
- b. faculty push-back
- c. difficulty sourcing data
- d. inputs may differ across universities

4. Engage college administration to define and communicate an optimal structure that will allow the equine program to reach its full potential.

Opportunities:

- a. greater efficiency of resources
- b. greater exposure
- c. increased growth
- d. decreased anxiety among elements of the program

Challenges:

- c. political issues and competition for resources
- d. additional agendas and biases

5. Develop strategies and faculty incentives to expand the creation and delivery of multi-media and on-line content across all missions.

Opportunities:

- a. increase departmental, college, and faculty member revenues
- b. alleviate bottle-necks in curricular offerings
- c. provide flexibility in course offerings
- d. promote creativity and eliminate significant frustrations among the faculty wanting to add more technology to the educational process
- e. enhance educational opportunities for off-campus personnel
- f. could bolster continuing education

Challenges:

- a. time
- b. additional resources
- c. staffing pressures

6. Identify the physical and programmatic needs required to replace Garrigus building and construct an on-campus multi-use livestock teaching/event facility.

Opportunities:

- a. help attract and retain quality faculty
- b. attract high caliber undergraduates
- c. increase faculty output
- d. enhance stakeholder excitement
- e. improve faculty and staff work-life evaluations

Challenges:

- a. university priorities

7. Develop a mechanism and timeline to improve/expand off-campus facilities, specifically the milking parlor, equine unit, and swine teaching barn.

Opportunities:

- a. improve student safety
- b. enhance ability to attract and retain quality faculty
- c. increase faculty output
- d. enhance stakeholder engagement
- e. improve faculty and staff work-life evaluations

Challenges:

- a. university and college priorities
- b. location limitations

8. Develop a mechanism for continued off-campus facility, maintenance, repairs, and renovations, and sustaining budgets through fluctuating agriculture markets.

Opportunities:

- a. increase undergraduate and graduate student safety
- b. minimize surprise expenditures and shortfalls
- c. increase quality and lifetime of facilities and equipment
- d. improve program quality
- e. provide greater flexibility in funding
- f. provide continuity in facilities repairs and updates

Challenges:

- a. State and Federal budgeting cycles
- b. university accounting structure and compliance issues
- c. university and state regulations
- d. confounded responsibilities with facilities management

9. Define the facility and resource needs to create a dynamic and sustainable undergraduate and graduate food science program in the department.

Opportunities:

- a. expand interest in the food science degrees
- b. improve the quality of education
- c. attract high quality faculty and graduate students

Challenges:

- a. dilution of resources
- b. number of students served

10. Engage extension specialists to explore sustainable funding models for program support.

Opportunities:

- a. increase departmental outputs
- b. ensure extramural continuity
- c. create additional partnerships

Challenges:

- a. faculty push-back
- b. perceived conflict of interest by stakeholders
- c. tradition

11. Enhance undergraduate and graduate experiential learning.

Opportunities:

- a. increased quality of education
- b. increased instructional capacity
- c. more opportunities for students
- d. animal well-being, industry, and global issues
- e. increased stakeholder interactions

Challenges:

- a. staffing challenges
- b. facilities
- c. impact on research

IV. Committee site-visit agenda



College of Agriculture, Food and Environment
 Department of Animal and Food Sciences
 Periodic Program Review
 Site Visit Agenda
 October 15-18, 2017

Date: October 14, 2017
 Pre-event: Saturday

Noon– 11:35 pm	Dr. Kris Johnson arrives at Bluegrass Airport at 11:35 pm. Hotel shuttle transports Dr. Kris Johnson from airport to Campbell House Inn.
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Date: October 15,
 Day 2017

Noon – 5:00 pm	Dr. Gerrard travels by personal vehicle to the Campbell House Inn.
6:30 – 8:00 pm	Review Committee has dinner and introductions at the Campbell House Inn at 1375 S Broadway, Lexington, KY 40504 Group is joined by Department Chair, Dr. Richard Coffey.

Date: October 16, 2017
 Day: Monday (Dress for farm tours, disposable rubber boots)

7:00 – 8:00 am	Breakfast on own (external guests dine at Campbell House Inn and charge meal to their rooms)
8:00 – 8:30 am	Committee Chair, Dr. Darrell Johnson, transports external guests to campus from Campbell House Inn
8:30 – 9:30 am	Meeting with College of Agriculture, Food and Environment Dean Nancy Cox and Assistant Dean for Academic Administration Lisa Collins. Committee receives their charge from Dean Cox and Dr. Collins reviews rules and procedures. AIC N24-B1
9:30 – 10:15 am	Meeting with Associate Deans in AIC N24-B1 Dr. Rick Bennett, Research Dr. Larry Grabau, Instruction Dr. Gary Palmer, Extension Dr. Steve Workman, Administration
10:15 – 11:00 am	Committee travels to Wethington Building by university bus and meets with Dr. Bernhard Hennig for tour of UK Superfund Research Center
11:00 – 11:15 am	Committee and Dr. Coffey travel by university bus to North Farm
11:15 – 11:45 am	Tour of AFS horse unit led by Dr. Coffey
11:45 – 1:00 pm	Break and lunch with North Farm AFS staff at Veterinary Sciences Stallion Barn (Drs. Coffey and Suman recused)
1:00 – 2:00 pm	Tour of poultry and dairy units led by Dr. Coffey
2:00 – 2:30 pm	Transport committee and Dr. Coffey to Little Research Center (LRC) in Woodford County
2:30 – 2:45 pm	Break
2:45 – 3:30 pm	Meeting with LRC and Princeton farm staff at sheep unit conference room. Snacks are provided. (Drs. Coffey and Suman recused)

3:30 – 4:00 pm	Presentation by Princeton personnel Dr. Roy Burris, Kevin Laurent, and Blair Knight at sheep unit conference room
4:00 – 5:15 pm	Tour of LRC farm (beef, swine, and sheep units) led by Dr. Coffey
5:15 – 5:45 pm	Transport committee and Dr. Coffey to campus by university bus
5:45 – 6:00 pm	Committee travels to Portofino restaurant at 249 E Main St, Lexington, KY 40507 by personal vehicles. External guests ride with designated local committee members.
6:00 – 7:30 pm	Working session and dinner at Portofino restaurant (wine cellar) for all committee members
7:30– 8:00 pm	Dr. Darrell Johnson transports external guests to Campbell House Inn

Date:	October 17,
Day	2017

7:00 – 8:00 am	Breakfast on own (external guests dine at Campbell House Inn and charge meal to their rooms)
8:00 – 8:30 am	Dr. Darrell Johnson transports external guests to campus from Campbell House Inn
8:30 – 9:30 am	Meeting with extension title faculty, AIC N24-B
9:30 – 10:30 am	Meeting with faculty (regular, research, and lecturer title series), AIC N24-B
10:30 – 12:00 pm	Campus departmental facilities tour (Dr. Coffey will meet committee at AIC N24-B and escort to USDA Agricultural Research Service Forage-Animal Production Research Unit in Ag North, followed by the Garrigus Building)
12:00 – 12:45 pm	Lunch with departmental undergraduate students, AIC N24-B (Dr. Suman recused)
12:45 – 1:00 pm	Break
1:00 – 1:45 pm	Meeting with departmental faculty (faculty in all title series who were not able to participate in one of the prior faculty meetings), AIC N24-B

1:45 – 2:30 pm	Meeting with technical staff (lab technicians, research analysts, research specialists, etc.), AIC N24-B (Dr. Suman recused)
2:30 – 3:30 pm	Meeting with postdocs, visiting scholars, and graduate students, AIC N24-B (Dr. Suman recused)
3:30 – 4:00 pm	Committee travels to Fayette County Extension Office at 1140 Harry Sykes Way, Lexington, KY 40504 by personal vehicles. Park in lot behind building and enter back door. Designated committee member transports external guests.
4:00 – 6:00 pm	Meeting and dinner with stakeholders at Fayette County Extension Office, room 1-2
6:00 – 7:00 pm	Working session for all committee members at Fayette County Extension Office. Committee submits Columbia Steakhouse orders for lunch tomorrow.
7:00 – 7:30 pm	Dr. Darrell Johnson transports external guests to the Campbell House Inn

Date:	October 18,
Day	2017

7:00 – 7:30 am	Dr. Darrell Johnson transports external guests to campus from the Campbell House Inn
7:30 – 8:15 am	Working breakfast with review committee, AIC N24-B1
8:15 – 8:30 am	Meeting with Director of Philanthropy, Pamela Gray, AIC N24-B1
8:30 – 9:15 am	Meeting with departmental support staff (business office staff, staff support associates, IT support, etc.), AIC N24-B1 (Dr. Suman recused)
9:15 – 10:15 am	Meeting with DGS, DUSs, and Academic Coordinators, AIC N24-B1
10:15 – 11:00 am	Meeting with departmental professional staff (extension associates/specialists, etc.), AIC N24-B1 (Dr. Suman recused)
11:00 – 11:30 am	Break and walk to Barnhart 249

11:30 – 12:30 pm	Conference call meeting with Extension agents, Barnhart 249
12:30 – 3:00 pm	Lunch and working session for committee, Barnhart 249. Lunch delivered from Columbia Steakhouse. Marcia Hicks joins group for philanthropy discussion.
3:00 – 3:30 pm	Break
3:30 – 4:30 pm	Committee presents preliminary findings to Dean and Associate Deans of the College of Agriculture, Food and Environment, Barnhart 249
4:30 pm	<p>Selected local committee member transports external guests to Campbell House Inn.</p> <p>Dr. Gerrard departs by personal vehicle October 19.</p> <p>Designated local committee member transports Dr. Kris Johnson to Bluegrass airport at 2:00 pm October 19 for a 3:40 pm departure.</p>

UK Program Review Implementation Plan

This **required** form is described as Appendix A in AR II-I.0.6.

College/Unit: Animal and Food Sciences

Date: 3-29-2018

Recommendation/ Suggestion	Source I/E/H*	Accept/ Reject**	Unit Response (resulting goal or objective)	Actions (including needed resources)	Time Line
1. Establish a long-term faculty-hiring plan that grows the research capabilities of the department.	E	A	<p>We agree it is important to have established priorities that guide faculty hires to grow the research capabilities of the department, but we believe these priorities should include how we ensure future faculty hires best meet the needs of the department across all of our mission areas (research, teaching, and outreach).</p> <p>We will establish priorities that guide faculty hires to meet emerging research opportunities, instructional needs, and outreach programming needs of clientele.</p>	<p>Department leadership in conjunction with the Advisory Council or an appointed subcommittee will develop a priority plan to present to faculty for their consideration and approval.</p> <p>The approved plan will be discussed annually in a Faculty Meeting to update.</p> <p>Work with CAFE Office of Philanthropy and Alumni to secure funding for endowed faculty positions.</p>	1 year and ongoing
2. Prioritize the hiring and retention of beef, swine and small ruminant extension specialist positions.	E	A	<p>The department concurs with the Review Committee that these three positions are important and should be priorities. However, we feel this recommendation should be combined with item 1 above and that the department should establish priorities that guide how positions across all mission areas are filled when they become vacant. Actions and Time Line are merged with those of recommendation 1. Please see item 1 above for additional details.</p>	Please see 1 above.	Please see 1 above

Recommendation/ Suggestion	Source I/E/H*	Accept/ Reject**	Unit Response (resulting goal or objective)	Actions (including needed resources)	Time Line
3. Develop appropriate benchmarking against peer institutions.	E	A	<p>We concur that benchmarking data has value for comparative purposes and for identifying areas for needed investment.</p> <p>Appropriate benchmarks will be developed.</p>	<p>Determine our appropriate benchmark land grant universities.</p> <p>Determine the appropriate measures to use for comparison.</p> <p>Data will be analyzed annually and presented/discussed in a faculty meeting.</p>	2 years
4. Engage college administration to define and communicate an optimal structure that will allow the equine program to reach its full potential.	E	A	<p>Because of the critical role AFS plays in the undergraduate EQM degree program, we recognize the importance of working with CAFE administration in developing plans that allow both the ASC and EQM undergraduate degree programs to thrive and reach their full potential.</p>	<p>Engage CAFE administration to develop a plan that ensures adequate instructional FTEs are available to meet the teaching, advising, and academic enrichment experience needs of both the ASC and EQM undergraduate degree programs.</p> <p>Work with CAFE administration and the Office of Philanthropy and Alumni to secure funding to expand both the teaching and research infrastructure at the AFS Horse Unit so that the growing needs for teaching do not hinder the research program.</p>	Ongoing

Recommendation/ Suggestion	Source I/E/H*	Accept/ Reject**	Unit Response (resulting goal or objective)	Actions (including needed resources)	Time Line
5. Develop strategies and faculty incentives to expand the creation and delivery of multi-media and on-line content across all missions.	E	A	<p>We agree and recognize the need for expanding the development and delivery of various multimedia and online content across all of our mission areas.</p> <p>Increase multimedia and online content available to youth and adult extension clientele.</p> <p>Determine feasibility of developing and offering summer undergraduate course offerings and an online MS degree program (perhaps one that is done in collaboration with the state's regional universities).</p>	<p>Work with CAFE administration and the Office of Philanthropy and Alumni to secure funding to hire additional technical support staff to assist with departmental multimedia and online content (web site, webinars, social media, etc.).</p> <p>Engage Curriculum Committees to determine needs and feasibility of developing online courses.</p> <p>Work with CELT to learn what assistance and resources are available to help with developing online courses.</p> <p>Explore opportunities for partnering with regional universities and the department's faculty member at Princeton in distance-education course offerings.</p> <p>Develop incentives for faculty that develop online courses.</p>	1-5 years

Recommendation/ Suggestion	Source I/E/H*	Accept/ Reject**	Unit Response (resulting goal or objective)	Actions (including needed resources)	Time Line
6. Identify the physical and programmatic needs required to replace the Garrigus building and construct an on-campus multi-use livestock teaching/event facility.	E	A	<p>The department and college have already identified many of the physical needs that limit teaching and research (college survey of research lab space, review of classroom needs, etc.). In addition, it is also clearly recognized that an on-campus facility that would allow animals to be brought on campus would greatly facilitate instructional laboratories, outreach activities, and allow multi-department use.</p> <p>Construct a new building that would house both AFS and Equine Programs to facilitate interactions between these collaborative groups.</p> <p>Construct an on-campus livestock teaching pavilion that could be used by multiple departments.</p> <p>Identify underutilized space in WPG to repurpose for short-term use until a new building is constructed.</p>	<p>Begin developing building concept plans that will meet the physical and programmatic needs of the department.</p> <p>Work with CAFE administration and the Office of Philanthropy and Alumni to secure funding for a new AFS building and on-campus livestock teaching arena.</p> <p>Work with CAFE administration and the Office of Philanthropy and Alumni to include these in the upcoming UK and CAFE fund raising campaign.</p>	Ongoing
7. Develop a mechanism and timeline to improve/expand off-campus facilities, specifically the milking parlor, equine unit, and swine teaching barn.	E	A	<p>The department has identified some specific needs at its off-campus Animal Units that would address current needs and enhance the teaching, research, and outreach activities. However, due to the need to ensure that any new facilities or expansions on existing facilities come with recurring funds for maintenance, repairs and renovations, we feel this recommendation should be combined with item 8 below. The Actions and Time Line have been merged with recommendation 8. Please see item 8 below for specific details related to this recommendation.</p>	Please see 8 below.	Please see 8 below

Recommendation/ Suggestion	Source I/E/H*	Accept/ Reject**	Unit Response (resulting goal or objective)	Actions (including needed resources)	Time Line
8. Develop a mechanism for continued off-campus facility, maintenance, repairs, and renovations, and sustaining budgets through fluctuating agriculture markets.	E	A	<p>The department concurs that there is a great need for developing a plan that addresses farm facility maintenance, repairs and renovations on existing off-campus Animal Unit facilities and any new facilities that are constructed at our off-campus Animal Units.</p> <p>Include in plans for moving the Dairy and Poultry Units recurring funds for ongoing maintenance, repairs, and future renovations.</p> <p>Construct new research facilities at Equine Unit.</p> <p>Perform needed repairs to ventilation exhaust stacks at Swine Unit.</p> <p>Implement a budget strategy that provides stability in operating the off-campus Animal Units.</p>	<p>Develop a prioritized list for new off-campus Animal Unit facilities and needed maintenance and repairs.</p> <p>Work with CAFE administration and the Office of Philanthropy and Alumni to include these in the upcoming UK and CAFE fund raising campaign.</p> <p>Work with CAFE administration and the Office of Philanthropy and Alumni to ensure any new facilities come with recurring funds for operation and maintenance.</p> <p>Work with CAFE administration and Animal Unit supervisors and managers to develop a budget strategy that provides stability and sustainability. This should include strategies that maximize efficiencies and income.</p>	Ongoing and as funds become available
9. Define the facility and resource needs to create a dynamic and sustainable undergraduate and graduate food science program in the department.	E	A	<p>The Food Science undergraduate instruction and graduate training programs offer opportunities for growth. A functional and well-equipped food processing plant and enhanced teaching laboratories are needed to provide adequate training for both undergraduate and graduate students.</p> <p>Develop a functional and well-equipped food processing plant.</p> <p>Develop well-equipped teaching labs.</p> <p>Offer multiple undergraduate and graduate full tuition scholarships.</p> <p>Develop a plan for awarding scholarships at the department level.</p>	<p>Work with the Office of Student Success to develop a plan for greater involvement of Food Science faculty in the awarding of scholarships.</p> <p>Work with CAFE Office of Philanthropy and Alumni to secure funding and (or) state-of-the-art equipment to develop a food processing plant and adequate teaching laboratories.</p> <p>Work with CAFE Office of Philanthropy and Alumni to secure funding for undergraduate and graduate full tuition scholarships, and funding for graduate student stipends.</p>	Ongoing and as funds become available

Recommendation/ Suggestion	Source I/E/H*	Accept/ Reject**	Unit Response (resulting goal or objective)	Actions (including needed resources)	Time Line
10. Engage extension specialists to explore sustainable funding models for program support.	E	A	<p>With declining state and federal funding, identifying alternative and sustainable funding models will be critical. Collaborating with other departments both within and outside of CAFE, as well as with commodity organizations, governmental agencies, and other industry support groups in delivering adult and youth programming will be essential going forward.</p> <p>Implement funding models that provide personnel, travel, and program sustainability.</p>	<p>Work with extension specialists to identify and evaluate funding models used at other land grant institutions to fund programs.</p> <p>Work with extension specialists to develop a strategy that provides for ongoing evaluation of programs offered to clientele to ensure clientele needs are being met.</p> <p>Encourage extension faculty to work with research faculty to develop AFRI-funded integrated grants (i.e., extension/research and research/extension grants).</p> <p>Work with CAFE Office of Philanthropy and Alumni to secure funding for support personnel (i.e., Extension Associates) and programs.</p> <p>Work with CAFE administration to explore the feasibility of counties providing financial support for some extension travel and programming.</p>	Ongoing

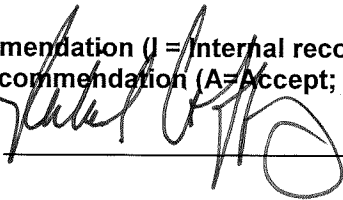
Recommendation/ Suggestion	Source I/E/H*	Accept/ Reject**	Unit Response (resulting goal or objective)	Actions (including needed resources)	Time Line
11. Enhance undergraduate and graduate experiential learning.	E	A	<p>As fewer students come from farming and animal production backgrounds, the need for providing hands-on, experiential learning opportunities as a part of the educational process has grown dramatically. Additionally, the college has added the requirement for all students having an “academic enrichment experience” to help fill this need.</p> <p>Implement a diverse experiential learning program for both undergraduate and graduate students.</p> <p>Hire a staff position (with appropriate academic qualifications) to provide oversight and leadership for undergraduate academic enrichment experiences.</p>	<p>Work with Curriculum Committee, Graduate Activities Committee, and faculty to develop a menu of academic enrichment experiences that will be of most benefit to our undergraduate and graduate students.</p> <p>Work with research and teaching faculty to develop a process for increasing undergraduate classroom and lab teaching opportunities for graduate students.</p> <p>Work with CAFE administration and the Office of Philanthropy and Alumni to secure funding for an Academic Enrichment Experience Coordinator position.</p>	Ongoing and as funds become available

Recommendation/ Suggestion	Source I/E/H	Accept/ Reject**	Unit Response (resulting goal or objective)	Actions (including needed resources)	Time Line
12. Increase funds available for undergraduate ASC scholarships, graduate student stipends, and graduate student tuition.	I	A	<p>Limits on the number and amount of scholarships available to graduating seniors with interests in pursuing Animal Science as a major makes it difficult for us to compete with regional universities in recruiting many Kentucky students. Additionally, decreasing departmental funds available for graduate student stipends and tuition has placed tremendous pressure on faculty to supplement (or fully fund) funds for graduate student training. Decreasing competitive federal funding levels further exacerbate this problem.</p> <p>Increase graduate student stipends to levels comparable with our benchmark institutions.</p> <p>Increase number of full tuition scholarships the department offers to undergraduate ASC students.</p> <p>Develop a plan for awarding scholarships at the department level.</p>	<p>Work with the Office of Student Success to develop a plan for greater involvement of Animal Science faculty in the awarding of scholarships.</p> <p>Work with CAFE Office of Philanthropy and Alumni to secure funding for graduate full tuition scholarships, and funding to increase both the number and amount of graduate student stipends.</p>	Ongoing and as funds become available

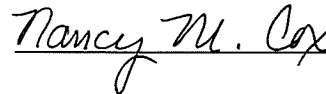
* Source of Recommendation (I = Internal recommendation; E = External Review Committee recommendation; H = Unit Head recommendation)

** Accept/Reject Recommendation (A=Accept; R=Reject)

Unit Head Signature: _____



Unit Head Supervisor Signature: _____



Date: _____

3-29-18