Academic Program Review
For the Period 2012-2019
Review Held Autumn 2020

Department of Animal Sciences

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1 Executive Summary

The Department of Animal Sciences in the College of Food, Agricultural, and Environmental Sciences (CFAES) at the Ohio State University is home to 31 faculty and 64 staff members as well as approximately 650 undergraduate students majoring in Animal Sciences and Meat Science who seek a BS in Agriculture or a BS in Nutrition. The Department also educates approximately 40 graduate students. The undergraduate program in Animal Sciences is one of the most robust in the nation and serves the largest undergraduate population among the nine academic departments in the CFAES. In addition to degree-seeking students, the Department serves the Ohio animal/livestock industry which in 2018, accounted for over $6.5 billion in estimated economic impact and employs nearly 50,000 Ohio citizens.

Our departmental mission is to discover and communicate knowledge about animals and their products, including their role and impact on society and the environment. The department has over a century of history dating back to 1902 and the formation of the Department of Animal Husbandry. In 1995, the current structure of the Department of Animal Sciences was created by the merger of the animal, dairy, and poultry science departments.

The Department is firmly established in conventional aspects of food and fiber production across its teaching, research, and outreach endeavors. Nutrition is a discipline of strength for

the Department, with emphasis on all major ruminant and non-ruminant food animal species. Tissue biology is the second area of excellence with programs in meat science and reproductive/mammary biology that have achieved national and international stature. More recently, the department has invested in microbial ecology, biomass utilization, and human/animal interaction as areas of interest to our students and stakeholders.

Faculty and staff in the Department are housed primarily in three academic buildings – the Animal Sciences building and Plumb Hall on the Columbus campus and Gerlaugh Hall on the Wooster campus. Animals units are located at five sites on the Columbus campus (poultry, dairy, equine, swine and beef), four sites on the Wooster campus (poultry, dairy, sheep, beef) as well as three sites managed at the College level (Eastern Agricultural Research Station – beef and sheep; Jackson Agricultural Research Station – beef and sheep; Western Agricultural Research Station – swine).

2 Animal Sciences in Ohio

The animal/livestock industry in Ohio represents significant strength and economic impact which establishes the importance of well-qualified individuals to support the workforce. “Ohio's agricultural and food production cluster with restaurants and bars directly account for…1 in 8 jobs in Ohio (DiCarolis, et al., 2017)”. This strength is further demonstrated in Table 1. Over $6.5 billion in estimated economic impact and nearly 50,000 jobs are created by livestock commodities alone. This is only further bolstered by Ohio’s rankings in US livestock production for 2018. Ohio holds six of the top 25th percentile rankings in major US livestock production categories as shown in Table 2.

Table 1: Ohio's Contribution to the US Livestock Industry (USDA NASS, 2017), (Ohio Livestock Association, 2018)

Commodity	Estimated Economic Impact	Farms in Ohio (estimated)	Jobs Created
Cattle & Calves	$1.45 billion	19,588	n/a
Dairy	$2.35 billion	2,400	14,400
Swine	$576.8 million	3,951	11,495
Poultry & Eggs	$3.3 billion	7,409	19,619
Sheep & lambs	Over $25 million	3,400	>3,000
Equine (Economics, 2017)	$1.4 billion	n/a	n/a

Table 2: Ohio rank in US livestock production, 2018. (USDA NASS, 2018), (Turner & Morris, 2019)

Commodity	Rank
Swiss cheese production	1st
Milk production	11th
Egg production	3rd
Turkey production	10th
Hogs and pigs	8th
Sheep and lamb	12th
Wool production	14th
Cattle and calves	16th
Equine (Economics, 2017)	6th

Food processing is also an important industry in Ohio, partly due to the state's location. Ohio's borders are within 600 miles of almost 60% of the US population as well as a large portion of Canada's population. According to the 2016 data from the US Census Bureau, Ohio accounts for 4.74% of the nation's general food processing capacity. Ohio's share of national food processing production in dairy products (milk, butter, cheese, and ice cream) is 4.9% (ranked 6th in the nation) and in slaughtering/processing is 2.2% (ranked 18th in the nation, up from 22nd in 2010). Within Ohio, dairy products represent 10% of food processing and beverage production. Between 2008 and 2018, the total export value of animal products that Ohio produced has increased from $444.9 million to $668 million, placing Ohio as the 18th highest exporter in the US which is up from 19th in 2008. Though this is just one rank increase, the total value of the exports represents a significant increase of $223.1 million in 10 years' time. Ohio has also increased in ranking for total US agricultural export value between 2008 to 2018 from 12th to 11th with a total value increase of $284.1 million.

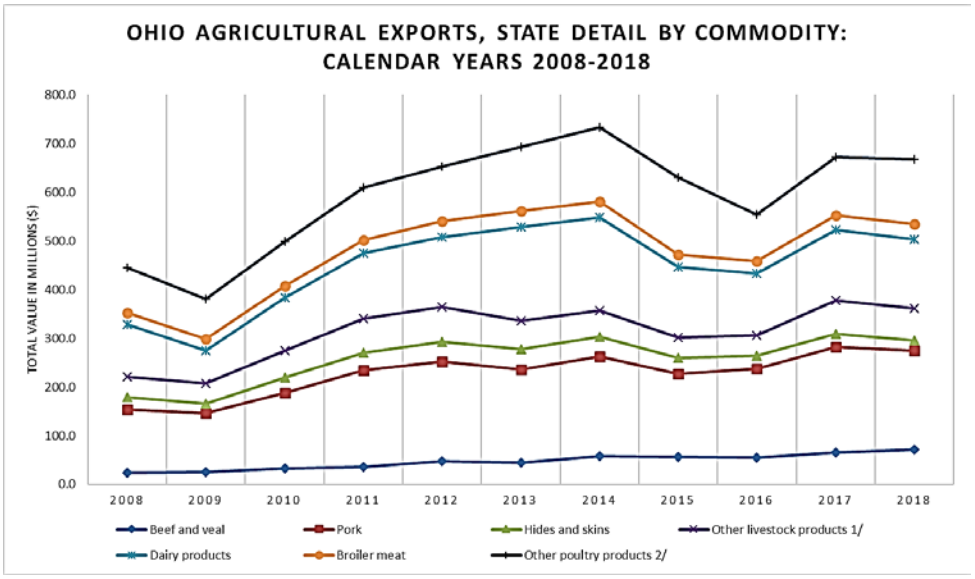


Figure 1: Ohio Agricultural Exports by Commodity, 2008-2018 (USDA ERS, 2019)[1]

Domesticated animals also play a vital role in providing companionship, recreation, and services to the state's 11.7M inhabitants, most of whom reside in urban centers. "The annual APPA [American Pet Products Association] report on pet spending found that overall spending in the U.S. pet industry increased 4.4% from 2017 to 2018 to $72.56 billion. (AVMA, 2019)" In 2018, the greatest expense for pets was food, followed by veterinary care and supplies and over-the-counter medicines (American Pet Products Association, 2019). These upward trends demonstrate the need for the continued development of well-trained animal scientists that can fill the jobs of veterinarians, nutritionists, researchers, and more. The Department of Animal Sciences is investing time and resources to meet these needs with the addition of CHAIRE (Center for Human-Animal Interactions Research and Education), as well as cultivating partnerships with the College of Veterinary Medicine.

[1] 1/ Includes other nonpoultry meats, animal fat, live farm animals, and other animal parts. 2/ Includes turkey meat, eggs, and other fowl products

3 Overview of the Department of Animal Sciences

The Department of Animal Sciences is one of nine academic units within the College of Food, Agricultural, and Environmental Sciences (CFAES) at The Ohio State University. It has a history made rich by time, change, and human resources that have always included talented faculty and staff, outstanding students, and devoted alumni.

The Department of Animal Sciences focuses on advancing animal sciences for the betterment of animals and humans through research, teaching, and outreach endeavors. The department is the leading provider of animal science education and outreach in the state of Ohio. Having formed strategic alliances with The Ohio State University College of Veterinary Medicine, Department of Human Nutrition in the College of Education and Human Ecology, the Animal Welfare Science Centre in Australia, and with other universities and institutions both in the United States and abroad - the department is consistently collaborating with other academic, industry, and government professionals and scientists across the world. As a result, our faculty conduct cutting-edge research that has widespread implications for both traditional and emerging agriculture, along with animal and human health, behavior, and welfare. Areas of our research foci include:

- Growth, development, and meat science
- Breeding, genetics, & reproduction
- Mammary biology & milk quality
- Animal welfare & behavior
- Nutrition & microbiology
- Waste management & biofuels
- Human-Animal interactions

The department's species foci include:

- Cattle (beef and dairy)
- Equine
- Poultry
- Small Ruminants (sheep and goats)
- Swine
- Companion animals

The department excels at integrating disciplines while pursuing our mission of discovering and communicating knowledge about animals and their products by taking multidisciplinary and interdisciplinary approaches.

3.1 History

The Department of Animal Sciences traces its beginning to a livestock and poultry course of study that became the Department of Animal Husbandry in 1902 in the College of Agriculture (Reese, 2010). The original emphasis was on teaching because livestock research was conducted at the Ohio Agricultural Experiment Station in Wooster. In 1920, the Poultry Husbandry Department was formed. In 1947, a separate Dairy Department was created, taking

on the name Dairy Science Department in 1950. In 1951, the Department of Animal Husbandry was changed to the Department of Animal Science, and along with it came more emphasis on research. The Ohio Agricultural Experiment Station became the Ohio Agricultural Research and Development Center (OARDC) in 1965, and it was merged with The Ohio State University in 1981. An important reference point for the purpose of this review occurred in 1995. At that time, the animal, dairy, and poultry science departments were merged into the current Department of Animal Sciences. Consolidation of programs at this scale has created many challenges and opportunities for faculty, staff, students, and alumni of the combined units and has made it important to periodically review the Department's mission and vision for the future.

3.2 University Mission & Vision

3.2.1 Mission

The university is dedicated to:

- Creating and discovering knowledge to improve the well-being of our state, regional, national, and global communities;
- Educating students through a comprehensive array of distinguished academic programs;
- Preparing a diverse student body to be leaders and engaged citizens;
- Fostering a culture of engagement and service.

We understand that diversity and inclusion are essential components of our excellence.

3.2.2 Vision

The Ohio State University is the model 21st-century public, land grant, research, urban, community engaged institution.

3.3 Department Mission

Our mission is to discover and communicate knowledge about animals and their products, including their role and impact on society and the environment. The delivery of this mission is directed to the students of The Ohio State University, the scientific community, stakeholders of the Department (as shown in Figure 2), and others who are interested in animals used for food and fiber production, recreation, and companion purposes.

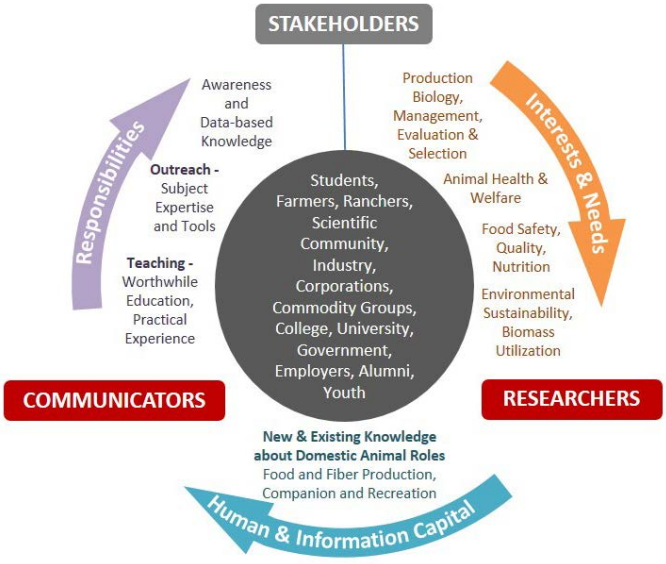


Figure 2: Department of Animal Science Stakeholders (ANSCI Vision and Mission, 2020)

3.4 Department Vision

We will be recognized as the premier provider in Ohio, and one of the top academic units in the nation, for undergraduate education in animal sciences. The Department will also be identified

nationally and internationally as an outstanding academic unit for graduate education in animal sciences. We will facilitate the development of students to become leaders and responsible world citizens with a knowledge base that includes an understanding of the economic, environmental, and social implications of animal production for food, fiber, recreation, and companionship. The Department will have a reputation in Ohio, nationally, and internationally for being a leader in developing and disseminating new knowledge in the biological sciences for producing food, companion, and service animals. The Department will be trans-disciplinary in its approach and responsive to current societal issues such as animal health, food safety, biomass utilization, and environmental sustainability.

3.5 Department Funding

Animal Sciences' annual operating budget primarily comes from three sources: Ohio State General Funds (GF), OARDC (research), and OSUE (Extension). These resources are managed by different personnel in different budget centers at the College level, which means that fiscal agendas and operating procedures must be well coordinated to achieve desired outcomes. The Department's combined budget from these sources exceeded $10.4M in 2019 (Figure 3a). These resources were supplemented by approximately $1.2 million in current-use funds consisting of endowment interest, development funds, and gifts (Figure 3b).

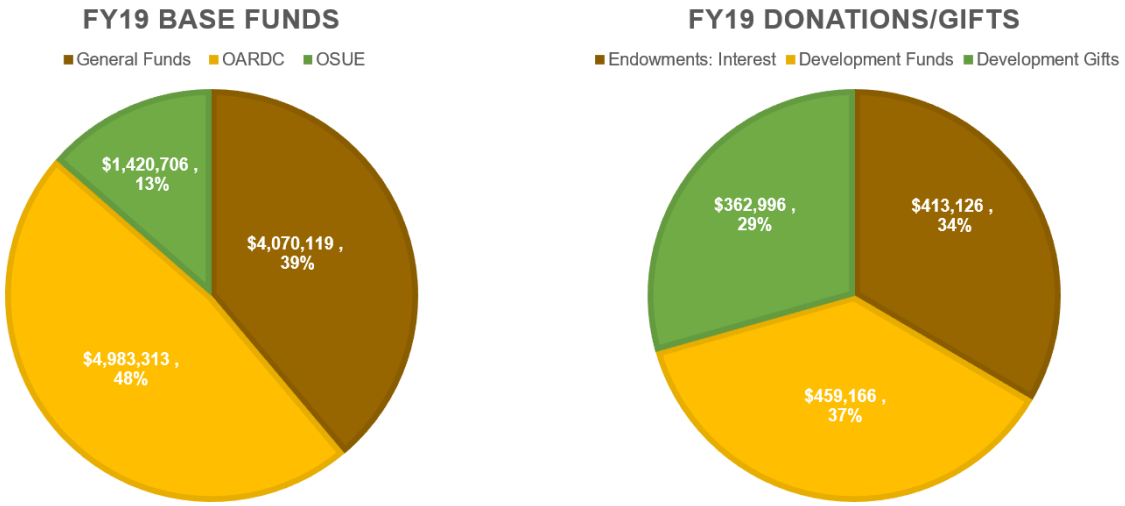


Figure 3: (a) Department 2019 budget (Research: OARDC, Extension: OSUE). (b) Current use funds for 2019.

Figure 4 represents the changes in the departmental budget from FY2012 to FY2019. As shown in Figure 1, there have been some significant changes over the past eight years. One of the key shifts in the graph is a result of the financial process in which faculty and staff salaries are paid. Previously, CFAES directly paid the salaries, but as of FY15 (General Funds) and FY17 (OARDC & Extension), CFAES now provides block funding to support the salaries of each department. Also, other considerations to shifts in the general fund include graduation rates, students and majors, and study abroad participation. It can be seen that the general fund has been increasing as the Department increases credit hours taught from FY15 to FY16.

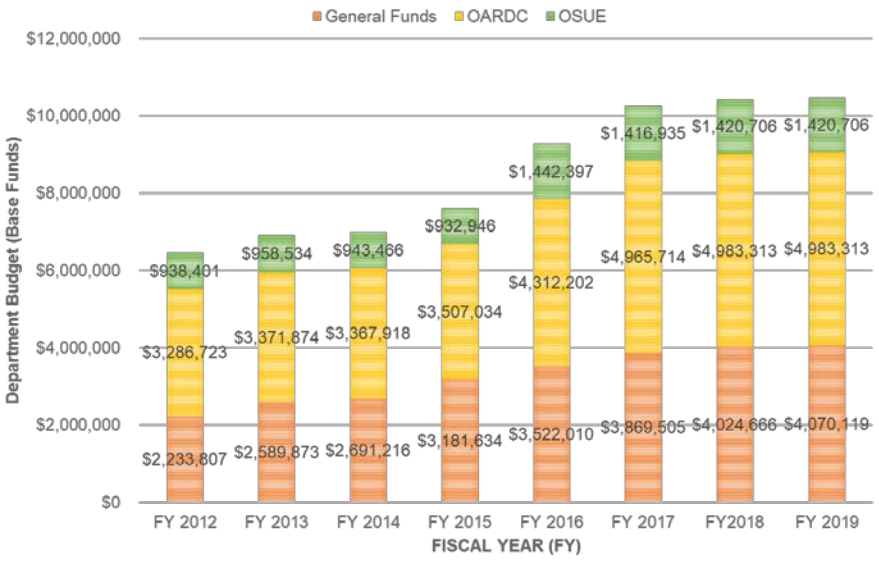


Figure 4: Animal Science Department Budget FY2012-FY2019

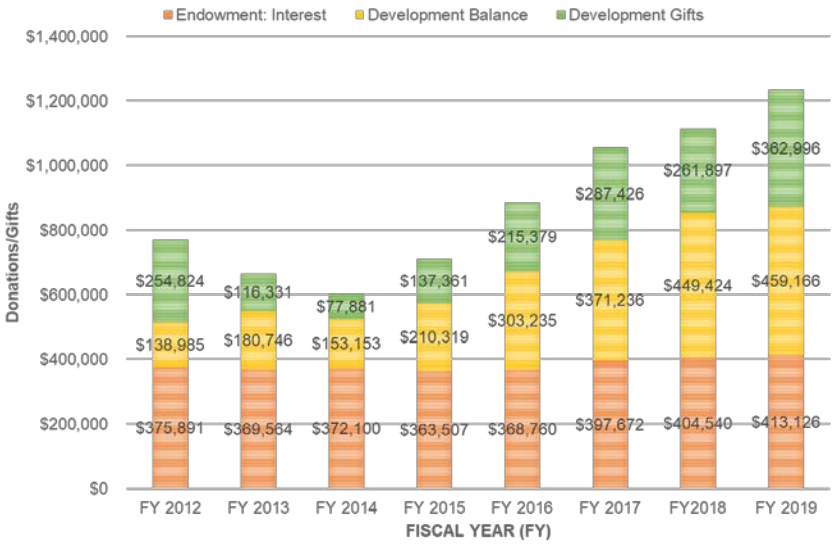


Figure 5: Current Use Funds FY2012-FY2019

Figure 5[2] represents the changes over the past eight years related to advancement funds within the department. As of 12/5/2019, there are a total of 102 current use restricted funds. This includes 32 development funds and 70 endowment funds. Another key factor to note which is depicted in Figure 5 is that the endowment interest remains relatively stable over the years even with the changes and fluctuations in the market. As the costs to conduct programs in a large comprehensive University have continued to increase over time (and state support has remained constant or decreased in some instances) the University, CFAES and the Department have all increased development efforts to help

[2] Endowment interest – earned from principal endowment investments, Development gift – new donations for the year, Development balance – carryover funds.

supplement expenses and offer new programs via corporate and private dollars. These gifts ebb and flow, but the general direction has been positive.

3.6 Programs

The Department is firmly established in conventional aspects of food and fiber production across its teaching, research, and outreach endeavors. Nutrition is a discipline of strength for the department, with emphasis on all major ruminant and non-ruminant food animal species. Tissue biology is the second area of excellence with programs in meat science and reproductive/mammary biology that have achieved national and international stature. More recently, the department has invested in microbial ecology, biomass utilization and human/animal interaction as areas of interest to our students and stakeholders.

Changing student and stakeholder demographics have caused the department to commit more resources to non-agricultural animals in companion and recreational roles, especially in teaching and outreach. The department has developed a course cluster in human-animal interactions, significantly bolstered its resources related to equine studies, and introduced a University general education course to address societal concerns about how animals are being managed to address human dietary needs. Current (Spring 2020) redesign of the University General Education curriculum involves the submission of thematic pathway proposals – and several of our faculty are submitting an “Animals and Society” theme. In addition, the department has been at the forefront of the development of a new University-wide center named the Center for Human-Animal Interaction Research and Education (CHAIRE). The Center is co-chaired by two Animal Science faculty and focuses on 1) Welfare and behavior, 2) Conservation, 3) Zooeyia (the positive health benefits on people interacting with animals), and 4) Social and companionship benefits of animals.

The department is also strengthening relationships with the Food Animal Health Research Program (FAHRP). This program was previously housed with the College of Veterinary Medicine but efforts are underway to house it as a Center called the Center for Food Animal Health (CFAH) under the CFAES. Center faculty will likely have their tenure home with the Department of Animal Sciences and graduate students will also be a component of the Animal Sciences. The Animal Sciences Department embraces international activities across all elements of its programs. It leads the CFAES in study abroad participation (in terms of the number of programs offered and student participation) and is a partner in the Australian Animal Welfare Sciences Centre. This partnership has resulted in trans-disciplinary research and outreach activities and has also provided access to internationally renowned scientists working in the area of animal welfare.

3.7 Reputation and Ranking

There are no broadly accepted measures of departmental reputation and ranking. However, The Ohio State University does subscribe to a service called “Academic Analytics”. Academic Analytics provides a number of useful metrics that can be compared from approximately

270,000 faculty members employed by over 400 U.S. Ph.D. granting institutions, with a database that includes 50,000 scientific journals. Data presented utilize that database and includes 28 Departmental faculty. The database coverage period is as follows: Articles: 2015-2018; Citations: 2014-2018; Conference Proceedings: 2015-2018; Books: 2009-2018; Grants: 2014-2018; Awards: No Limit.

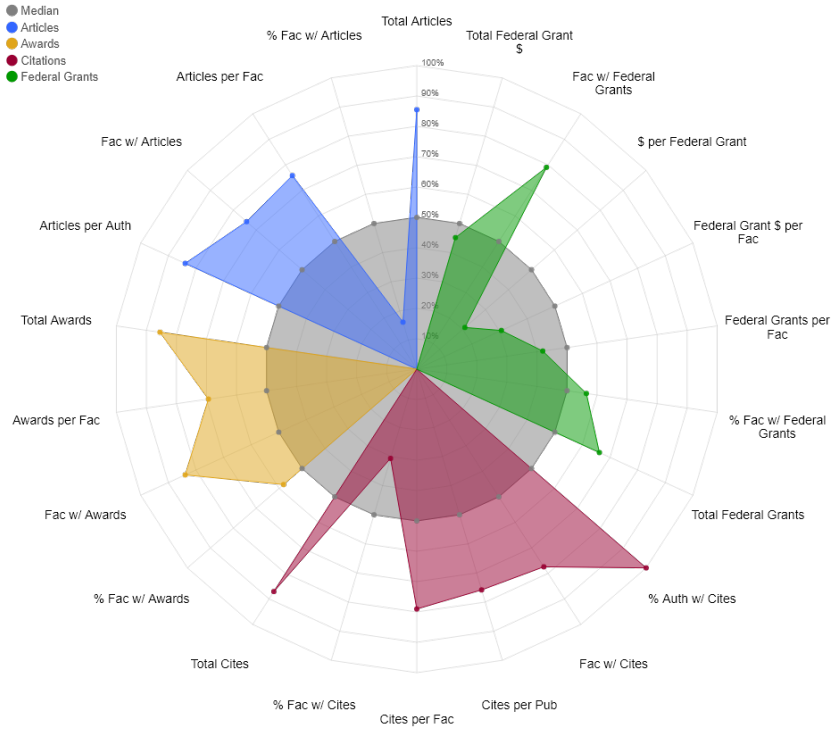


Figure 6: Productivity Radar, produced by Academic Analytics. Comparison of Ohio State University Dept. of Animal Sciences relative to database median: Journal Articles, Awards, Citations, and Federal Grants. This is a comparison of 39 Ohio State faculty against 1287. (As of December, 2019)

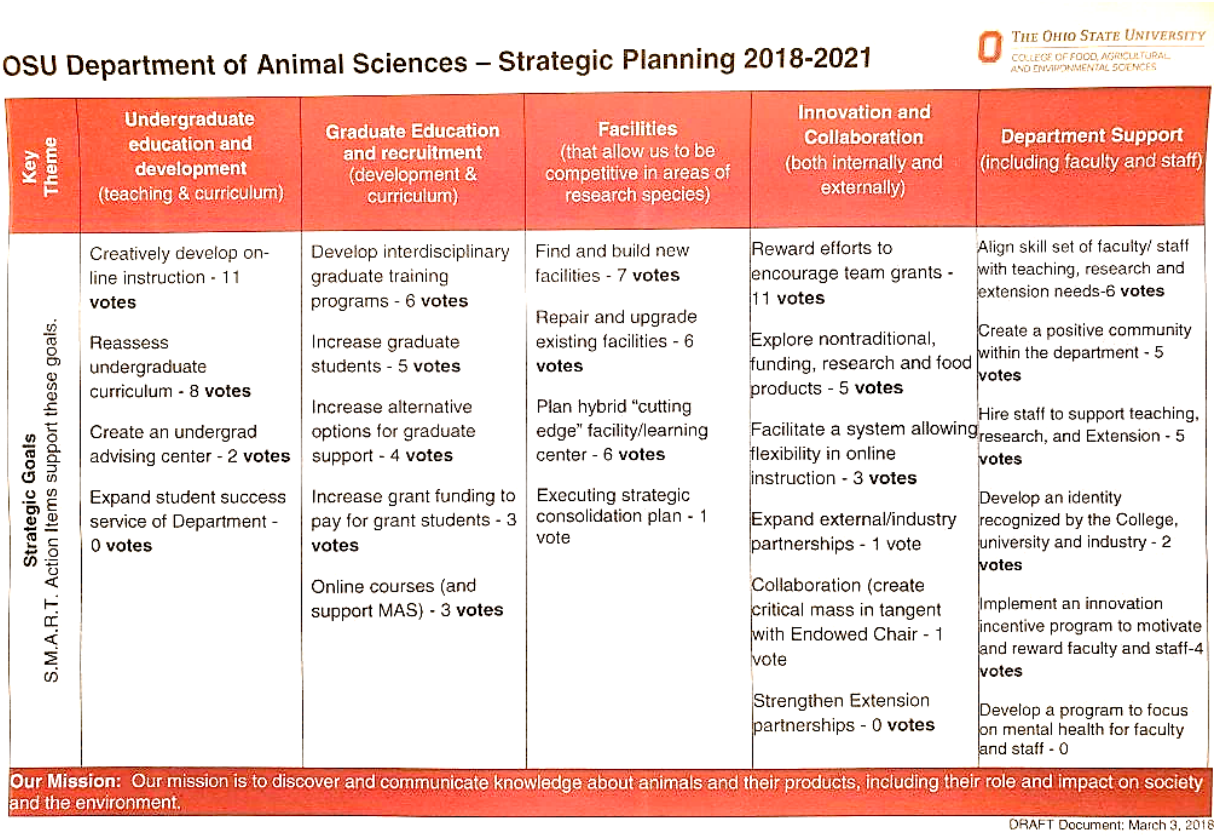
Figure 6 compares the Oho State Animal Sciences Department on several metrics related to Journal Articles, Awards, Citations, and Federal Grants. The gray "circle" is the 50% median amongst the 61 departments included in the database. Citing several of the metrics - Ohio State ranks significantly above the average on journal articles/faculty members, total awards, awards per faculty member, citations per faculty member, total federal grants, and faculty members with federal grants. As a strong research entity, the Department needs to continue emphasis on seeking federal funding.

Another measure of ranking can be found in Appendix 1, which measures articles per faculty member. In this ranking of 61 departments, Ohio State ranks 16th.

3.8 Strategic Plan

The Unit engaged in an abbreviated strategic direction exercise shortly after John Foltz started as Department Chair in 2017. This process identified several key focal points across the areas of Undergraduate education and development, Graduate education and recruitment, Facilities, Innovation and Collaboration, and Department Support, as demonstrated in Figure 7.

Follow-up to this exercise has resulted in 1) additional efforts to develop online curriculum; 2) planned curriculum revision – post University revisions to the Ohio State General Education Curriculum; 3) facilities – the planned construction of a new Multi-Species Animal Learning Center (MALC) located at Waterman Farm; Waterman Dairy - significant facility remodeling (enclosing free stalls, new ventilation, new manure handling system, indoor group housing for calves and installation of robotic milking, feeding and manure handling); merging of Krauss Dairy and ATI dairies in Wooster; merging of and moving of Case Road Sheep flock to Wooster and upgrading of Wooster sheep facilities; 4) The hiring of two new staff to assist with instruction.



OSU Department of Animal Sciences – Strategic Planning 2018-2021

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL AND ENVIRONMENTAL SCIENCES

Key Theme	Undergraduate education and development (teaching & curriculum)	Graduate Education and recruitment (development & curriculum)	Facilities (that allow us to be competitive in areas of research species)	Innovation and Collaboration (both internally and externally)	Department Support (including faculty and staff)
Strategic Goals S.M.A.R.T. Action Items support these goals.	Creatively develop on-line instruction - 11 **votes** Reassess undergraduate curriculum - 8 **votes** Create an undergrad advising center - 2 **votes** Expand student success service of Department - 0 **votes**	Develop interdisciplinary graduate training programs - 6 **votes** Increase graduate students - 5 **votes** Increase alternative options for graduate support - 4 **votes** Increase grant funding to pay for grant students - 3 **votes** Online courses (and support MAS) - 3 **votes**	Find and build new facilities - 7 **votes** Repair and upgrade existing facilities - 6 **votes** Plan hybrid "cutting edge" facility/learning center - 6 **votes** Executing strategic consolidation plan - 1 vote	Reward efforts to encourage team grants - 11 **votes** Explore nontraditional, funding, research and food products - 5 **votes** Facilitate a system allowing flexibility in online instruction - 3 **votes** Expand external/industry partnerships - 1 vote Collaboration (create critical mass in tangent with Endowed Chair - 1 vote Strengthen Extension partnerships - 0 **votes**	Align skill set of faculty/ staff with teaching, research and extension needs-6 **votes** Create a positive community within the department - 5 **votes** Hire staff to support teaching, research, and Extension - 5 **votes** Develop an identity recognized by the College, university and industry - 2 **votes** Implement an innovation incentive program to motivate and reward faculty and staff-4 **votes** Develop a program to focus on mental health for faculty and staff - 0

Our Mission: Our mission is to discover and communicate knowledge about animals and their products, including their role and impact on society and the environment.

DRAFT Document: March 3, 2018

Figure 7: Animal Sciences Department Strategic Planning document, March, 2018.

The mission of the unit is well-aligned with the current CFAES Strategic Alignment (Figure 8). The department has increased its focus on sustainability and will continue to put more effort into this area. This includes research on bio digestion and waste management (Ezeji, C. Lee,Yu), reduction of nutrient loss in manure (Firkins, C. Lee, Moraes, Wenner). One health is also a key area of interest in the department: this includes research on gut health (Bielke, Jacobi), antibiotic alternatives (Jacobi and a proposed new hire in nutritional immunology); and human

impact of farm microorganisms (Yu). Focus on research, teaching and outreach in the Rural-Urban interface area involve issues related to animal welfare and the department's involvement in the Center for Human Animal Interaction Research and Education (Parker, George, Moeller, Cole). In addition, addressing the rural-urban interface will be the key to our planned Multi-Species Animal Learning Center, the focus of which will be teaching and outreach in the animal sciences. Finally, the department holds up its robust graduate education program as a strong contributor to the area of Leadership – preparing the next generation of scientists and leaders.

Figure 8: CFAES Strategic Alignment Draft, 10/21/19.

4 Faculty & Staff

As of October 31, 2019, 31 faculty members and 64 staff are located in Columbus, Wooster, and elsewhere (Table 3). Classroom teaching takes place primarily in Columbus with the support of virtually all Departmental faculty members and a number of support staff and adjuncts, while research is carried out in both Columbus and Wooster. Extension faculty and staff are also based in both Columbus and Wooster. The Department enjoys the support of over 57 individuals with an adjunct, courtesy, emeritus, associated faculty appointments and also embraces contributions from its retired faculty and staff.

Table 3: Animal Sciences personnel numbers

Personnel	Columbus	Wooster	Elsewhere
Faculty	22	9	
(Faculty with Extension Appt.)	8	1	
Emeritus Faculty	18	14	
Adjunct Faculty	8	5	
Courtesy Faculty	6	2	2
Staff	28	30	1
Post-Doctoral Researchers	3		

4.1 Faculty Size

There are currently 26 regular, tenure-track faculty members and 5 Clinical track faculty members with salaries funded through the Department of Animal Sciences. The breakdown of the 31 FTE includes 13.95 from Ohio State General Funds, 12.24 from OARDC, and 4.81 from OSUE (Ohio State University Extension) this is shown in Figure 9.

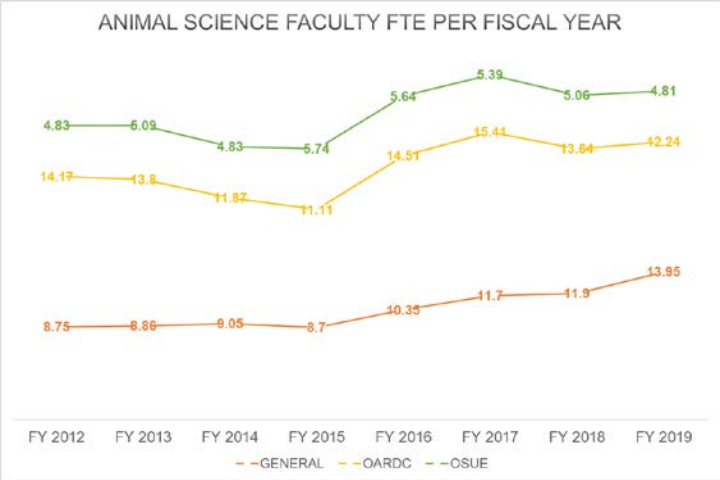


Figure 9: Animal Science Faculty FTE Per Fiscal Year

4.2 Faculty Demographics and Diversity

Since our last internal self-study, the Department has begun to see a changeover within its faculty and demographics. During the last study, the majority of the department held the rank of Professor and 75% were aged 50 or older. As was expected and pointed out at the time, the department has gone through turnover which now creates a different outlook within the faculty. Currently, the faculty is 60% ranked as Assistant (12) or Associate (5) Professors, which outnumbers the Professors (14). In addition, though the average age of the faculty is currently 51, 42% of the faculty are now <=50 years of age. These trends are depicted in Figure 10.

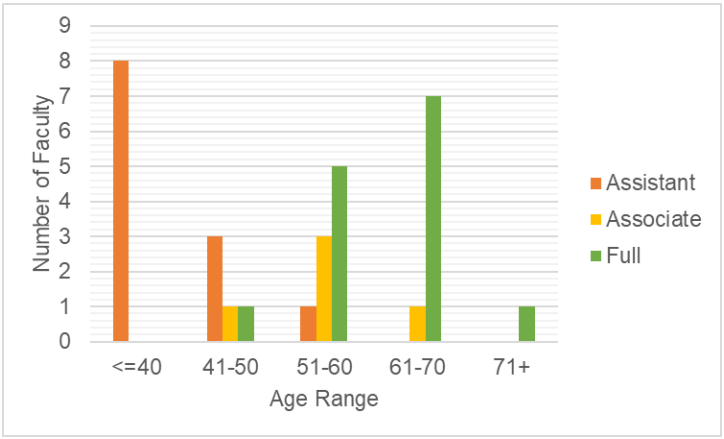


Figure 10: Age Distribution of Faculty (As of 2019)

Faculty diversity has also increased significantly over the past several years. Female faculty members (including clinical faculty and instructors) now number 9, or 27% of the Animal Sciences faculty. Hispanic faculty now number 4, or 10.3% of the faculty.

In addition, Table 4 outlines the diversity in the discipline and species specialization held within the department. The left side of the table represents species specialization in gray highlights, red highlights indicate specialization as it relates to Extension. The right side of the table indicates the specialization area. It can also be seen that there is the equivalent of 13.7 FTE dedicated to teaching, 12.02 FTE dedicated to research and 3.78 FTE dedicated to Extension.

Table 4: Faculty research and Extension focus areas and target species (valid as of Dec. 2019)

Beef	Dairy	Meat Sci	Poulty	Sheep	Swine	Other	Faculty	Assist	Assoc	Prof	FTE	T	R	E	Genetics	Environment	Microbiology	Nutrition	Physiology	Tissue	Behavior	Animal Health
							Bielke, L	x			1.00	0.20	0.80							Meat Science		
							Boyles, S			x	1.00	0.20		0.80				Forage Utilization			Animal Handling	
							Chiavegato, M	x			0.50		0.50			Grazing Management						
						Equine	Cole, K		x		1.00	0.20		0.80			Immune Response		Immune Response			
							Cressman, M	x			1.00	1.00								Meat Science		
							Davis, M			x	1.00	0.50	0.50		Feed Utilization							
							Eastridge, M			x	1.00		0.20	0.80				Feed, Milk Composition				
							Enger, B	x			1.00	0.20	0.80				Mastitis		Mammary	Mammary		
							Ezeji, T		x		1.00	0.10	0.90			Bioctalyst Development	Fermentation					
							Firkins, J			x	1.00	0.30	0.70				Nutrition	Feed Utilization				
							Garcia, L	x			1.00	0.80		0.20						Meat Science		
							GuerraGarcia, A	x			1.00	1.00							Reproduction			
							George, K	x			1.00	1.00				Human dimension/cultural effects						
							Jacobi, S	x			1.00	0.30	0.70				Immune Response	Nutrient Metabolism				
							Kinder, J			x	1.00	1.00							Reproduction			
							Knipe, C	x			0.50		0.12	0.38						Processing		
							Lee, C	x			1.00	0.20	0.80			Nutrient management		Feed Utilization				
							Lee, K			x	1.00	0.30	0.70		Fat/Muscle Development			Tissue Development		Fat/Muscle		
							Moeller, S			x	1.00	0.50		0.50	Muscle/Fat Developoment						Animal Handling	
							Moraes, Luis	x			1.00	0.50	0.50			Nutrient modeling		Dairy systems				
						Fish	Ottobre, J			x	1.00	0.80	0.20						Reproduction			
							Parker, E		x		0.50	0.50				Environmental health	Feed safety	Feed safety			Animal welfare	Animal Health
							Parker, T		x		1.00	0.30	0.70			Grazing management		Metabolism	Stress physiology	Muscle/Blood	Cattle welfare	Parastie management
							Peffer, P			x	1.00	1.00						Lipid Metabolism				
							Pope, W			x	1.00	1.00				Intensive Grazing			Reproduction			
							Relling, A	x			1.00	0.20	0.80					Feed Utilization		Growth		
							Velleman, S			x	1.00	0.20	0.80						Extracellular Matrix Bio	Muscle		
							Weiss, W			x	1.00		0.70	0.30		Feed/Nutrition		Feed Utilization				
							Wenner, B	x			1.00	1.00					Nutrition	Feed Utilization				
						Fish	Wick, M		x		1.00	0.40	0.60							Meat Science/Fat/Muscle		
							Yu, Z			x	1.00		1.00			BioMass Util. Gastrointest						

3

[3] Faculty research is general not species specific.

4.3 Faculty Quality and Reputation

A variety of indicators can be used to gauge faculty quality and reputation. As already noted, most faculty members in Animal Sciences are engaged with classroom teaching at both undergraduate and graduate levels. The university provides a standardized assessment of teaching through its Student Evaluation of Instruction (SEI) instrument, which is required in all courses taught by junior faculty members pursuing tenure and/or promotion and expected by the Department and College of all instructors in all courses. The SEI provides an overall rating (scale of 1-5) for each instructor and compares this rating to groups selected from across the College and University according to course electivity and size. Data from the last nine academic years show overall ratings for instructors from Animal Sciences that are consistently higher than comparison groups from the College and University (Table 5). While these data do not differentiate the teaching efforts of faculty and staff, they clearly indicate that the overall quality of teaching in the Department is above average.

Table 5: Means and standard deviations for overall ratings from Student Evaluations of Instruction for courses taught by instructors from Animal Sciences with respect to comparison groups in the CFAES and University.[4]

Academic Year	Department		College		University	
	SEI Avg.	SD Avg.	SEI Avg.	SD Avg.	SEI Avg.	SD Avg.
2010-2011	4.54	0.62	4.29	0.77	4.31	0.75
2011-2012	4.32	0.71	4.32	0.71	4.29	0.74
2012-2013	4.49	0.71	4.32	0.76	4.34	0.73
2013-2014	4.57	0.53	4.37	0.69	4.33	0.72
2014-2015	4.58	0.55	4.39	0.71	4.34	0.73
2016-2017	4.62	0.46	4.38	0.69	4.36	0.72
2017-2018	4.43	0.73	4.38	0.73	4.35	0.73
2018-2019	4.56	0.59	4.43	0.69	4.37	0.81

Other common metrics for assessing faculty quality and reputation include awards, professional leadership to societies and editorial boards, and publication impacts. Over the past seven years, the Animal Sciences faculty have received over 40 honors/awards for excellence in teaching, research, outreach, and service at local, regional, and national levels (Table 6).

Table 6: Number of awards received by faculty in the last seven years. (Complete list in Appendix 2)*

Years	**College/University**				**State/Regional**				**National/International**			
	T	R	E	S	T	R	E	S	T	R	E	S
2012-2018	8	2	0	3	0		1	1	2	14	1	9

*T = teaching/advising, R = research, E = Extension/outreach, S = service incl. administration

[4] Means and standard deviations are based on all of the courses in the instructor's college from the previous four quarters (AY10-11 & AY11-12) or the previous three semesters (AY12-13 to present) that are in the same Comparison Group as the course being evaluated. Comparison Groups are determined according to the course electivity and size. Item10 refers to the "overall" rating of the instructor, on a scale of 5 (Excellent) to 1 (Poor). The University averages of Item10 means and standard deviations were computed for all SEI reports.

Between 2012 to 2019, Faculty within the Department have contributed nearly 560 publications as shown in Table 7. This work was released in numerous journals, most of which were national or international in scope with *Journal of Animal Science* (52 publications), *Journal of Dairy Science* (87 publications), and *Poultry Science* (61 publications) being the most popular outlets. A full breakdown of the top ten journals can be found in Appendix 4.

Journal editorial service has also been a long-standing tradition in the Department. Seven current faculty members have served one or more appointments on the editorial boards or as Editors of *Frontier in Microbiology, Journal of Dairy Science,* and *Poultry Science* just to name a few. One faculty member has had a long-term appointment as co-Editor-in-Chief of *Animal Reproduction Science* and was recently promoted to Editor-in-Chief in 2017. A complete list of faculty editorial services is included in Appendix 3.

Table 7: Faculty Publications for the Department of Animal Sciences

	2012	2013	2014	2015	2016	2017	2018	2019
Total Publications	45	53	58	64	84	96	85	74
Publications/Research FTE	4	4	5	5	7	8	7	6
Publications/FTE	2	2	2	2	3	3	3	3

FTE calculations are based on 2019 Department FTE = 29.5, Research allocated FTE = 12.05.

To further increase the quality of the Faculty and Staff within the Department, the Department has taken advantage of the University Discovery Theme effort, initiated in 2014. This program assists the department by covering 50% of the faculty member's salary. There are currently eight broad themes, including one entitled "Food and Agricultural Transformation". The Animal Sciences department has hired two faculty under this initiative: Tony Parker (sustainable livestock systems) and Marilia Chiavegato (Agroecosystems Management - shared position with the Department of Horticulture and Crop Sciences). The department has also partnered with the Department of Food, Agricultural and Biological Engineering to put together a faculty position in Precision Livestock. We recently posted and interviewed for this position, and had a failed search. The Department plans to repost this position.

The Ohio State University initiated an innovative Teaching Support Program (TSP) in the fall of 2018. The program, offered through the University Institute for Teaching and Learning (UITL), is a voluntary professional development program to provide additional support for teaching faculty and their work in the classroom. The program is available to tenure-track faculty, clinical faculty, and lecturers. The program features three parts:

- The Teaching Practices Inventory, a self-directed survey asking faculty members to analyze their own course learning goals, assignments, testing and other criteria to provide a baseline for faculty members as their teaching practices evolve.
- Teaching@Ohio State, a series of online modules focused on key elements of effective teaching and a supporting UITL Reading List. The goal is to equip faculty with tools to explore new approaches in the classroom.
- A five-year pilot instructional redesign program asks faculty members to rethink how they teach courses and use the redesign to evaluate the impact and effectiveness of their teaching.

Each of the parts of the program features a monetary incentive to boost the pay of the faculty who volunteer. Faculty can earn base-salary increases of between $400 and $1,200 to complete each part of the program. As of 1/1/20, 20 Animal Sciences faculty have initiated this learning, and 11 have completed all parts of it.

Another significant change to the Animal Sciences department structure occurred in 2018 when the department made the transition from faculty-supervised animal operations to a full-time animal operations director. Julie Morris was hired into this newly created position, which provides overall focus and direction for the department's livestock units. All of the farm managers now report to Julie, allowing for better direction and oversight of facilities and coordination of repairs, remodels, and new projects.

Another new administrative approach has been the creation of a Departmental Administrative group, which meets weekly with the Department chair. This group is comprised of the Department Chair, the 2 Associate Chairs, the Director of Animal Operations, and the Administrative Office manager.

The Animal Sciences department has increased the number of professors of professional practice (clinical) appointments in the past decade. The department currently has 4 professional practice faculty members or 12% of the faculty (the Department's Pattern of Administration allows clinical faculty to comprise no more than 20% of the total tenure track faculty).

4.4 Faculty Recruitment and Retention

Faculty salaries in the Department of Animal Sciences are competitive for the majority of ranks within the CFAES as shown in Figure 11. According to benchmark[5] data shown in Figure 12, the Department is above average for Assistant (1.08%) and Associate (29.45%) ranks but below average for Professor (-12.33%) rank. This is an improvement over the last self-study in which the Department was lagging behind on all ranks by nearly 10%.

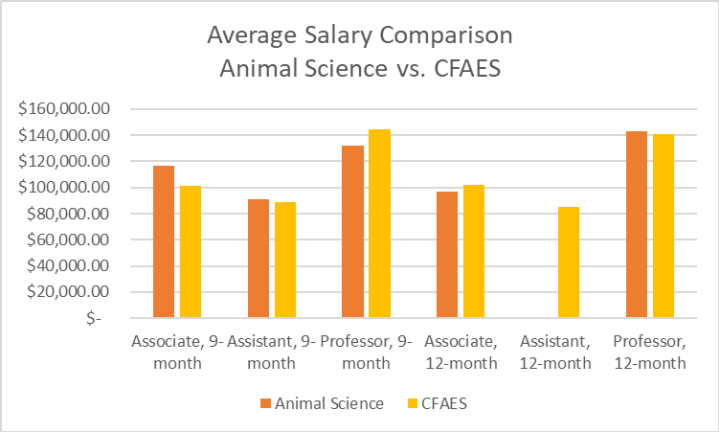


Figure 11: 2018-2019 Department of Animal Sciences faculty salary comparison within CFAES

[5] Benchmark Universities include; Arizona, Florida, Illinois, Maryland, Minnesota, Penn State, and Wisconsin.

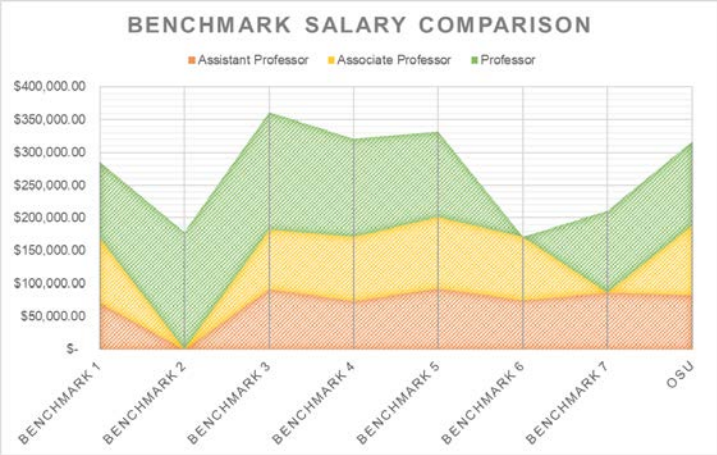


Figure 12: 2018-2019 salary comparison with benchmark institutions

From 2012-2019, there have been 18 departures from the Department of Animal Sciences. Of these, half were retirements and half were resignations. Filling new positions left vacant by departures is not necessarily the same as replacing positions. The Department attempts to look at changes in need as well as different and novel capabilities offered by new hires. A complete list of faculty changes over the last seven years can be found in Appendix 5.

4.5 Career Support and Intellectual Life of the Unit

The intellectual well-being of the unit is heavily dependent upon the existence of engaged faculty members who are constantly seeking to expand their knowledge of the animal sciences and to promote the Department as a place for active learning. The Department supports the careers of its faculty members by encouraging special assignments (SAs) and Faculty Professional Leave (FPL) proposals that emphasize intellectual growth and development of new skill sets. SAs provide the possibility of a one-semester reduction in regular responsibilities at full pay to permit faculty to focus effort on a defined project approved by the Department and College. The FPL program is open to tenured faculty with at least seven years of service at Ohio State and can involve one or more semesters of leave; 1 semester at 100% of base salary or more than 1 semester at 67% of base salary. Over the past five years, three faculty members have completed faculty professional leave assignments focused on different topics, but none have taken full international sabbaticals. In addition, the department fully supports faculty participation in the Teaching Support Program (TSP) discussed in more detail earlier in this study. Another point to note is that Animal Sciences faculty regularly support visiting scientists in their labs, and this has made a strong contribution to the intellectual life of the department.

4.6 Staff

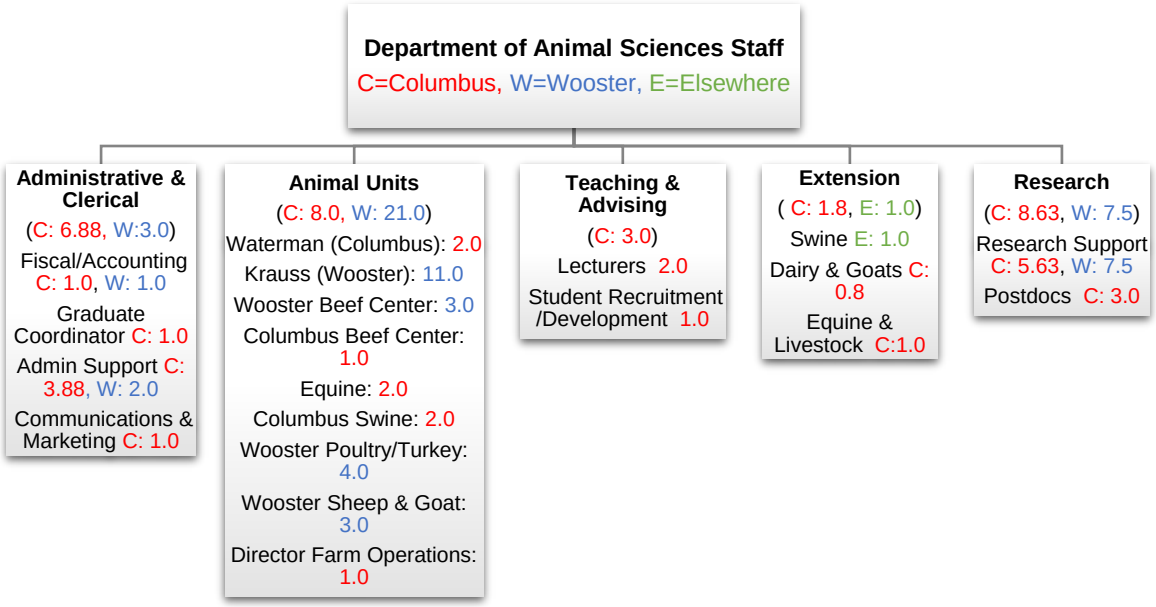


Figure 13: Department of Animal Sciences staff, FTE as of October 31, 2019

Staff members in the Department support all aspects of Department administration and animal unit function as well as teaching, research, and Extension programs (Figure 13).
The staff demographics show that the majority of the staff are female and/or identify as white (Table 8). This is a slight shift compared to the prior self-study in which the genders were nearly equally split.

Table 8: Staff Gender and race demographics

Male	Female	White	Hispanic	Asian	Undisclosed
27	37	54	4	4	2

Another shift in the demographics in comparison to the prior self-study is represented in the staff age and years of continuous service. In the 2011 study, staff ages were almost evenly divided over four decades from the 20's to the 50's. However, the distribution of the staff now leans heavily to <=30 in age with nearly 38% of the staff being in this category (Figure 14, A.). This is directly correlated with the shift in the majority of the staff having <=10 years of service, roughly 66% (Figure 14, B.).

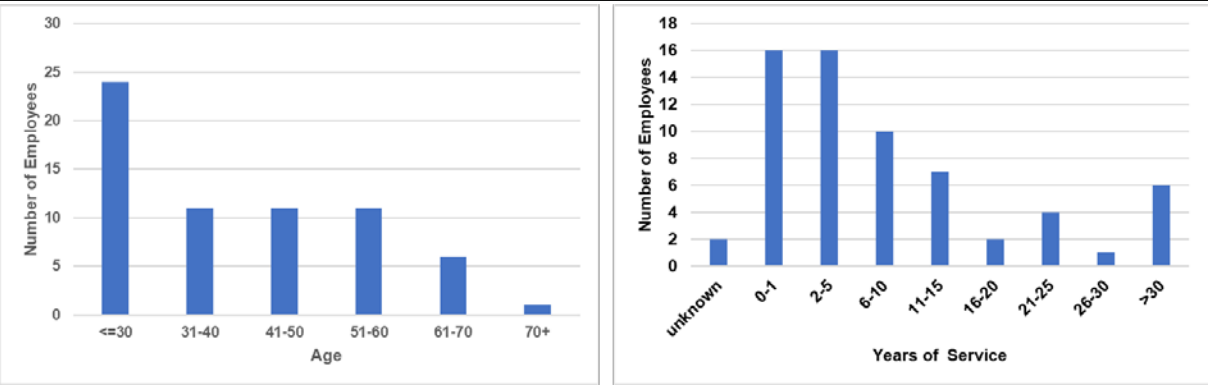


Figure 14: (a) Staff description by age. (b) Staff description by years of service to Ohio State (unknown: start date was not recorded in the human resource database used).

4.7 Response to Recommendations in 2011 Self-Study (Faculty)

Recommendation 1) A strong mentoring program needs to be established with 2-3 senior faculty serving as mentors for each assistant professor. These can be appointed by mutual agreement between the department chair and the assistant professor. **Response:** Each assistant professor has been assigned a mentoring committee of 2-3 senior faculty. They meet with these pre-tenure faculty several times/year to provide suggestions and guidance. Some committees have been more effective than others, but the result has been generally positive.

Recommendation 2) A college and departmental orientation program should be established for all new faculty to better acquaint them with the resources available, expectations and how to operate within the college and departmental cultures. This is especially important for new faculty at OARDC in Wooster. **Response:** We have established that this is a valuable suggestion, and are moving forward to institute an orientation timeline within the department and a new faculty handbook that includes copies of the Pattern of Administration and Appointment, Promotion, and Tenure document. All new faculty are invited to a college orientation program and are automatically enrolled in the Teaching@Ohio State program.

Recommendation 3) The department is fortunate to have a grants manager who can be strong support for faculty when submitting grants. **Response:** The person in this position left shortly after the previous self-study and was not replaced. The College has discouraged departmental people in this role; however, we are investigating posting a science writer/grant writer position, which would be a broader position, but have the needed skills and fill this role. The office of research in the College has also expanded its services in grant submitting since the last review.

5 Research

The Department's research programs represent a broad view of animal agriculture and animal roles in society. Faculty members are constantly challenged to grow their scholarly expertise while responding to the changing needs of stakeholders. This evolution requires frequent assessments of the research funding environment and opportunities to continue sustainable and relevant research as federal and other resources become more competitive. Parallel evaluations are required at the Department level concerning how best to meet emerging programmatic challenges such as animal welfare and environmental quality.

5.1 Research Foci and the CFAES Grand Challenges

As mentioned earlier in this study, the College is currently undergoing a strategic alignment process in which a series of college-wide priorities, grand challenges, and values are being created. The current draft (Figure 8) reflects the grand challenges as; 1) Sustainability, 2) One health, 3) Rural-urban interface, and 4) Leadership. The descriptions of each are as follows;

1. Sustainability – simultaneously ensuring viable agriculture production, food security and safety, and environmental and ecosystem sustainability.
2. One health – studying the intersection or interaction among human, animal, and environmental health.
3. Rural-urban interface – exploring the tensions and opportunities created in the communities, industries, policies, economies, and communications between rural and urban residents.
4. Leadership – preparing the next generation of scientists and leaders.

The Department has been consistent with the leadership of the college with the College, industry, and it's stakeholders by focusing its research efforts on addressing the grand challenges of the CFAES. Sustainability has been addressed by understanding the impact of climate change on animal production systems, improving the efficiency of animal production, identifying critical control points in the food supply chain that can be manipulated to reduce the use of antibiotics and anthelmintics, and improving nutrient/manure management of animal production systems. The faculty also investigate improving the growth and development of livestock and the use of biomedical models to investigate the genetic manipulation of carcass traits and muscle function.

5.2 Inter- and Trans-disciplinary Research

Faculty within the department are involved in interdisciplinary research. The INFACT initiative has encouraged the participation of faculty across the university to develop research programs that address the CFAES grand challenges. The department has two faculty tied to INFACT – Dr. Tony Parker and Dr. Marilla Chivagato. The Department also supports the Center for Human and Animal Interaction Research and Education (CHAIRE). The Center has been operating for two years and currently has vibrant research and education programs that are divided into four main focus areas: Animal Welfare and Behavior, Companionship, Conservation, and Zooeyia. The center currently has projects that involve the disciplines of veterinary Science, social work, nursing, environmental science, animal science and industry. It is envisioned that the CHAIRE will develop into a university-based center of excellence for Human and Animal Interaction. The Department also participates in an interdisciplinary Ph.D. program through Ohio State University Nutrition (OSUN), covered in more detail in section 7.7.

5.3 International Research

Faculty members within the Department are active in pursuing international collaborations through research, teaching, scholarly presentations, and study abroad activities. During the period between 2011-2019, our Faculty has engaged with at least 29 countries in pursuit of research opportunities and scholarly presentations. If you include, teaching and study abroad, over 40 countries have been engaged. A full detailed list of the international activities conducted by our faculty can be found in Appendix 6. The Department also continues its collaboration with

the Animal Welfare Science Center at Melbourne University (Australia) as well as the precision animal agriculture group at the Central Queensland University (Australia).

5.4 Research Funding

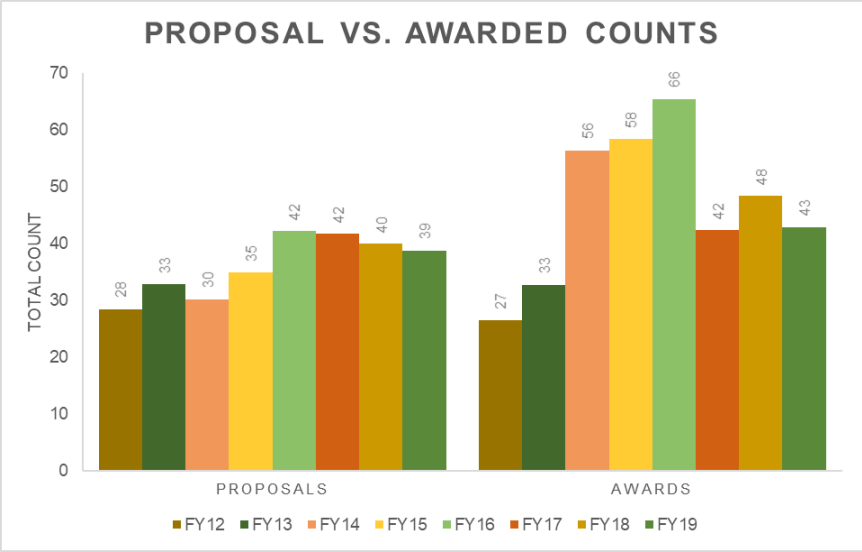


Figure 15: Proposal vs. Award Counts by Year

Research funding within the Department is variable from year to year based on active projects, grant submissions, and awarded grants. The total number of proposals submitted per year between 2012 to 2019, has remained relatively stable with a low of 28 in 2012 and a high of 42 in 2012 as well as 2013. With these proposals, the Department has been successful at maintaining a high percentage of awards which is demonstrated in Figure 15. The top sponsors of awarded grants are shown in Figure 16 for FY18.

Though the University and College prefers a higher percentage of F&A recovery, the data shows that our Department is almost consistent in receiving less than the requested F&A percentage requested (shown in Figure 18). This could be attributed to many factors but one may be that the funders are less likely to fund F&A rather than the direct portion. The F&A percentage is overlaid in Figure 17[6] which represents the actual expenses in comparison to the F&A recovery for each FY between 2012-2019.

Top Sponsors of Awarded Grants (FY18)

Name:		Amount	% Distribution
1.) Zinpro Corporation	$	291,634.50	24%
2.) DSM Nutritional Products, Inc	$	284,149.00	23%
3.) National Institute of Food & Agriculture	$	204,965.00	17%
4.) Kemin Industries Inc	$	74,750.00	6%
5.) SmithBucklin	$	67,122.46	6%
Remaining Sponsors	$	294,099.31	24%

Figure 16: Top Sponsors of Awarded Grants

[6] Years represented (FY12, FY17, & FY18) in which the awards were higher than the proposals reflect a lag period from the time the proposal is submitted to the period when awards are funded.

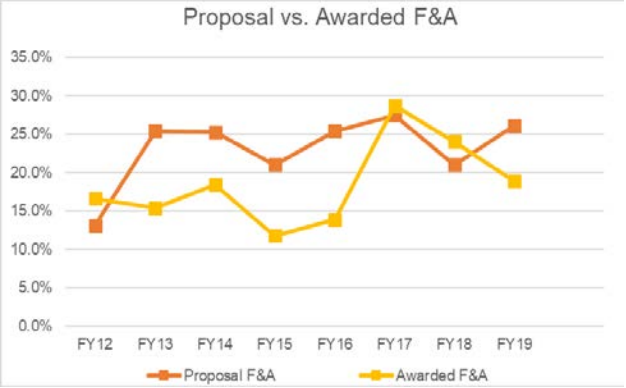


Figure 18: Proposal vs. Awarded F&A

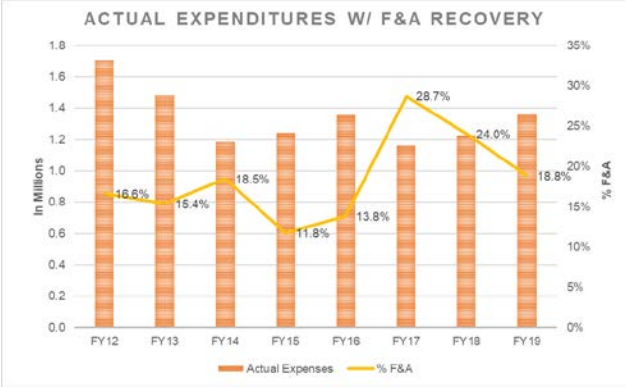


Figure 17: Actual Expenditures w/ F&A Recovery

The Department also participates in SEEDS: The Ohio Agricultural Research Development Center (OADRC) Research Enhancement Competitive Grants Program, which is an opportunity to apply for seed money to develop the necessary preliminary data for a strong grant application or matching funds to leverage external funding. Figure 19 represents the new SEEDS projects by year in the Department**.**

	2012	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019**
Faculty	5	4	3	2	6	5	4	3
Undergraduate	3	0	1	1	1	2	1	1
Graduate	2	2	3	2	1	1	3	2

** As of 10/21/2019*

Figure 19: Count of new SEEDS projects by year in the Department

5.5 Response to Recommendations in 2011 Self-Study (Research)

Recommendation 1) In today's research environment, the major thing that will take this department into an elite position is success in the grant process. To achieve this, the departmental culture will have to shift to interdisciplinary teamwork rather than individual effort. Researchers will need to develop collaborations not just within the department and Ohio State, but with institutions outside of Ohio. **Response:** The department has made some progress in this area, as junior faculty are reaching out to other departments and other institutions more so than in the past and by the Department participation in the Discovery Theme program. The development of the Center for Food Animal Health may also encourage interdisciplinary research.

6 Students and Educational Programs

The Department seeks to recruit and train students to not only become functional members of society but also leaders of the next generation of citizens, agriculturists, and scientists dedicated to the betterment of humankind through the wise use and stewardship of animal resources.

6.1 Faculty and Staff Resources Dedicated to Teaching

In the last measured academic year (AY) (2018-2019), the Department employed 13.7 teaching FTE. Figure 20 measures courses with fixed credit hours[7].

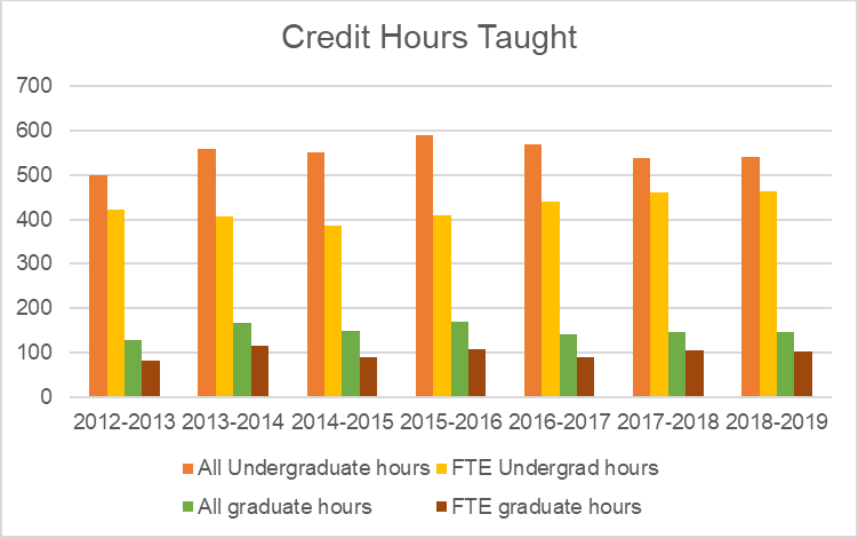


Figure 20: Credit Hours Taught by Academic Year

In order to sustain the quality of instruction and personal advising expected by the faculty and CFAES administration, the Department has become increasingly reliant on support from staff and adjunct faculty. The nature of this support is summarized in Table 9. Many of the classes provided by staff are professional practice courses involving hands-on training or management techniques; however, adjuncts and staff also bring expertise to the classroom that is not currently available from within the regular faculty ranks. In addition to formal teaching and advising, several staff members have an essential role in managing student programs and activities. Their efforts include logistical support and coordination for the Animal Sciences Graduate Program, the Undergraduate Student Success Center, and all of the Department's undergraduate clubs. These individuals have a major impact on the quality of the student experience within the Department of Animal Sciences.

[7] Not included are independent studies or field experience courses with variable credit hours per student taking them. Individuals excluded from FTE include staff whose primary purpose is not teaching and faculty members from other departments who only co-teach or teach one course within the department. The chart begins with AY 2012, this is the first full-year Ohio State offered all courses in semesters.

Table 9: Support from Staff and Adjunct Faculty

Support Group Staff No.	Course/Activity	Highest Degree
4	Undergraduate Academic Advising	MS, MS, MS, PhD-DVM
1	Undergraduate Recruitment	MS
1	Dairy Judging Team	BS
1	Livestock Judging Team	BS
2	Buckeye Dairy Club	BS, MS
1	Saddle and Sirloin	BS
1	Pre-Vet Club	PhD-DVM
1	ANIMSCI 1100 (.5 Cr)	MS
2	ANIMSCI 2000 Animal Handling (3 Cr)	BS, DVM
1	ANIMSCI 2200.03 Animal Systems (2 Cr)	PhD-DVM
2	ANIMSCI 2301 Equine Behavior & Training (3 Cr)	BS, BS
2	ANIMSCI 2401 Advanced Equine Behavior & Training (3 Cr)	BS, BS
1	ANIMSCI 2700 Diverse Fields & Opportunities w/ ANIMSCI (1 Cr)	MS
1	ANIMSCI 3100 Animal Growth & Development (3 Cr)	MS
1	ANIMSCI 3131 Equine Feeds and Feeding (3 Cr)	MS
1	ANIMSCI 3170 Animal Health I (2 Cr)	DVM
1	ANIMSCI 3270 Animal Health II (2 Cr)	PhD-DVM
1	ANIMSCI 3300 Livestock Selection and Evaluation (3 Cr)	BS
1	ANIMSCI 3301 Equine Evaluation and Selection (2 Cr)	MS
1	ANIMSCI 3307 Dairy Cattle Selection & Evaluation (2 Cr)	BS
1	ANIMSCI 4002.02 Beef Cattle Production Lab (1 Cr)	PhD
1	ANIMSCI 4005 Companion Animal Biology & Behavior (3 Cr)	PhD-DVM
1	ANIMSCI 4105 Domestication, Form, and Function of Dogs (3 Cr)	PhD
1	ANIMSCI 5032 Non-Ruminant Nutrition (3 Cr)	PhD-DVM

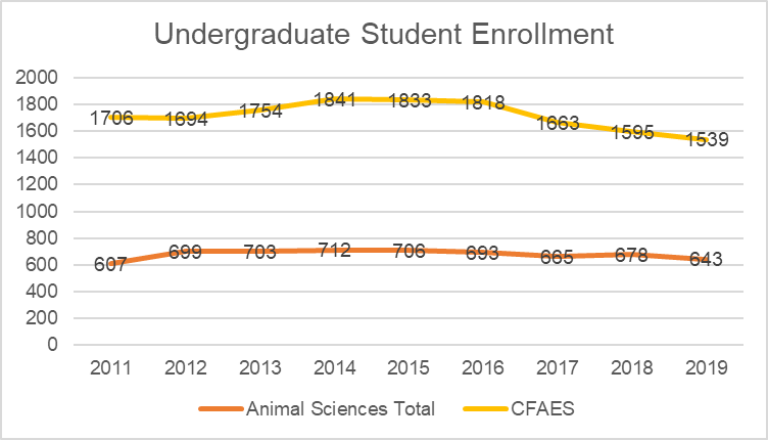


Figure 21: Undergraduate Student Enrollment

6.2 Undergraduate Programs

Undergraduate students within the Department choose from either a major in Animal Science or Meat Science to achieve a BS in Agriculture or a BS in Nutrition. In addition, students are able to choose from one of three specializations (Animal Biosciences, Animal Industries, Veterinary Technology) in the Department to further refine their degree program.

Undergraduate student enrollment in the Department (and the CFAES) increased slightly during the first half of the past decade but has seen a slight decrease since its peak in 2014 (Figure

21). The number of majors in the Department during this time period has ranged from a low of 607 in 2011 to a high of 712 in 2014. Animal Sciences as a percentage of the total college enrollment has remained relatively stable and has averaged approximately 40% of the Columbus campus population. The School of Environmental & Natural Resources is not included in the CFAES numbers.

The Department also provides four minors not available to Animal Sciences students: Animal Nutrition, Animal Science, Animal Pre-Veterinary Medicine, and Dairy Science. The Human-Animal Interactions and Equine Science minors are only available to Animal Biosciences and Animal Industries specializations as a second minor. Meat Science majors can minor in any of the Animal Sciences minors except for Meat Science; all Animal Sciences majors can minor in Meat Science. Non-agricultural major numbers in Animal Sciences minors have varied with the peak in 2018 (47) and the low in 2016 (15). The average number of non-agricultural majors in Animal Sciences minors is 33. Total enrollment is outlined in Table 10.

Table 10: Undergraduate Enrollment in Minors offered by the Department

Minor	2013	2014	2015	2016	2017	2018	2019
AGR Majors:							
Animal Nutrition	0	2	5	6	3	0	0
Animal Science	24	28	20	22	24	19	19
Animal Pre-Vet Medicine (2013 1st year of minor)	0	0	1	0	1	0	2
Dairy Sci (2014 1st year)	0	4	2	2	6	7	5
Equine Science	20	18	15	10	11	13	8
Human-Animal Interactions (2014 1st year of minor)		4	8	10	13	11	10
Meat Science	21	22	25	32	32	27	31
Non-AGR Majors:							
Animal Nutrition	1	1	1	0	0	1	1
Animal Science	13	12	11	14	18	16	11
Animal Pre-Vet Medicine	3	9	14	0	12	11	0
Dairy Sci	0	0	0	0	1	0	1
Equine Science	3	6	6	1	0	5	2
Human-Animal Interactions	0	2	6	0	12	13	15
Meat Science	0	0	2	0	2	1	1

6.3 Undergraduate Curriculum

The core curriculum in Animal Sciences includes fundamental courses in genetics, physiology, and nutrition that are intended to provide a basis for understanding biological and physiological processes foundational to all animal systems. Some undergraduate-graduate level courses also include introductions to modern molecular techniques that have evolved to become essential “tools of the trade” over the past decade. Additional courses focus directly on animal production, management, evaluation and selection, meat products, and animal health and welfare. Many of the latter classes include laboratories or access to animal facilities with the goal of providing hands-on opportunities for students. The need for practical animal experience is a common desire expressed by faculty, stakeholders, and many students. The convenience of having animal units close to campus is important to fulfilling this hands-on commitment and makes the Department increasingly unique as other animal sciences departments are forced to close or

move their animal unit(s) further from campus. The proposed Multi-Species Animal Learning Center (MALC) to be located on the Waterman Farm on campus will help to fulfill this commitment.

6.4 Undergraduate Student Diversity

Student diversity within the context of this review includes gender, race/ethnicity, sexual identity, community type, and subject matter interest. Information on gender and race/ethnicity has been systematically collected for a number of years. Clearly, the population of undergraduate students in Animal Sciences is and has been predominantly female and Caucasian. Over the past decade, male students have decreased from 19% of the student body in 2013 to 17% in 2019 (Figure 22a). Over the same time period, the proportion of minority students has increased, but comprised only 17% of the total population in 2019 (Figure 22b).

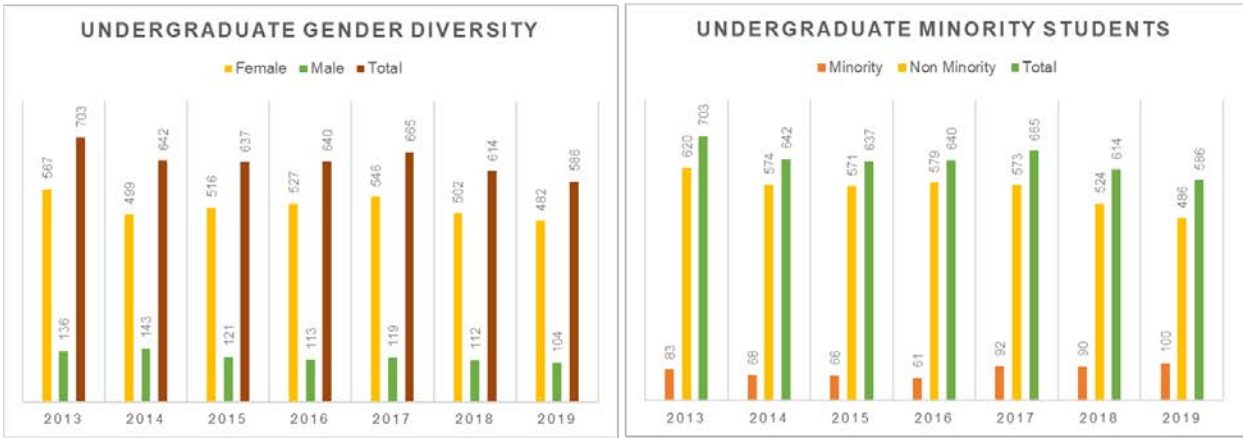


Figure 22: a) Undergraduate Student Gender Diversity, b) Undergraduate Minority Students

6.5 Quality of Student Experience

6.5.1 2012-2018 Undergraduate Student Assessment

The College of Food, Agricultural, and Environmental Sciences (CFAES) implemented a six-year assessment program in 2012. The goal of the CFAES academic programs is to provide quality educational experiences for college students, on the undergraduate and graduate levels. The goal of the assessment process is to have well-defined student learning goals and supporting outcomes. Meaningful evidence is then gathered to see if students are achieving these stated learning goals. Lastly, the data collected is used to make informed decisions for the benefit of the programs by providing continuous quality improvement and educational experiences for the students.

For the Animal Sciences Undergraduate Program six learning goals have been established, each with expected learning outcomes and methods/means by which the quality of student learning will be assessed. The assessment process requires direct and/or indirect measures with targeted performance standards. The six program learning goals are:

1. Communicate effectively, both orally and in writing
2. Develop global awareness, citizenship, and social responsibility
3. Contribute to respectful management of animals and the environment

4. Understand the integration of knowledge among anatomy, physiology, genetics, nutrition, and reproduction
5. Understand the importance of the use of reliable knowledge, sound logic, and principles of ethical decision making in problem-solving
6. Have an awareness of how the disciplines of Animal Sciences enhance production and companion animal management systems and impact their resulting products

The minimally acceptable criterion for these supporting outcomes methods is 75% of students scoring 70% or higher on the identified assessment tasks for the measurement of achievement for this outcome. When 90% of the students obtain scores of 90% or higher on the selected assessment associated assignments, the performance standard constituting programmatic excellence for this learning outcome will be attained.

The Department developed an assessment program for our BS in Agriculture and the BS in Nutrition, which is aligned with the BS in Nutrition in the College of Education and Human Ecology, Department of Human Sciences. The learning goals for the BS in Nutrition are:

1. Communicate effectively, both orally and in writing.
2. Develop global awareness, citizenship, and social responsibility.
3. In the context of nutrition, contribute to the respectful management of animals and the environment.
4. Understand the integration of knowledge of nutritional sciences with anatomy, physiology, genetics, and reproduction.
5. Understand the importance of the use of reliable knowledge, sound logic and principles of ethical decision making in problem-solving.
6. Have an awareness of how nutritional sciences enhance and impact animal systems.

In accordance with the College, the Department began the process of data collection from the undergraduate student population to evaluate their level of mastery in six core areas in 2012. These core areas included communication, civic & global awareness, responsibility, knowledge integration, ethical knowledge use, and discipline impact. The process (outlined in Appendix 7 & Appendix 8**.**) spanned the period between 2012 to 2018 in which the performance levels of undergraduate students enrolled in assessment designated courses were evaluated. Table 11 outlines the assessment goals, measures evaluated per goal, total assessment reports evaluated, and overall composite performance levels of undergraduate students enrolled in assessment designated courses between 2012 and 2018.

Table 11: 2012-2018 Undergraduate Student Assessment Overall

GOAL (Outcome)		MEASURES	ASSESSMENT ACTIVITIES REPORTED (N)	EXEMPLARY (90% or greater)	ACCEPTABLE (70 – 89.9%)	NOT ACCEPTABLE (Less than 70%)
COMMUNICATION	(Oral)	Student presentations	859	76.5	21.8	1.7
	(Writing)	Student compositions	1725	63	33.9	3.1
CIVIC & GLOBAL AWARENESS		Student compositions Internship performance	1646	73.8	24.3	1.9
RESPONSIBILITY		Student presentations Student compositions	3540	69.5	27.2	3.3
KNOWLEDGE INTEGRATION		Student presentations Student compositions Internship performance	2418	73.1	24.5	2.4
ETHICAL KNOWLEDGE USE	(Problem Solving)	Student presentations Student compositions	1915	68.4	29.7	1.9
	(Decision Making)	Student presentations Student compositions Case studies	2022	83.8	15.5	0.7
DISCIPLINE IMPACT		Student presentations Student compositions	3516	71.6	24.9	3.5

Figure 23 depicts the percentage of students below or above the programmatic minimal acceptable criterion for excellence or acceptable performance based on the data collected. Programmatic excellence was achieved when 90% of the students obtained scores of 90% or greater. The programmatic minimal acceptable criterion was 75% of students scoring 70% or greater on associated composite assessment measures for a given goal.

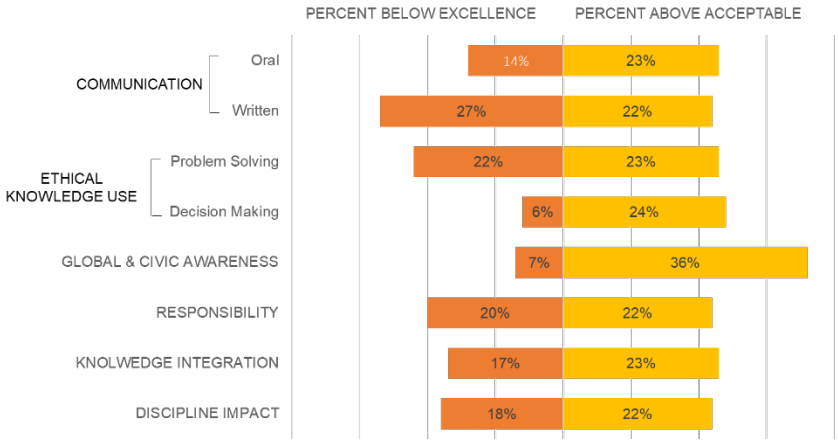


Figure 23: Student Assessment Goals, Percent below/above excellence

Given that we are at the end of the six-year assessment program, a new assessment plan is being developed for the Department. The revised learning goals and outcomes are due to the College by January 29, the development of a curricular map is due by March 1, and then the final plan for the Department is to be submitted by April 15. Then, an assessment plan for our minor programs is due by June 3, which will be the initial assessment plan for our minors.

6.5.2 Animal Sciences Graduates Evaluation

During the years, 2015 and 2018, Animal Sciences graduates were surveyed to determine their degree of satisfaction that their major contributed to the growth and the skills and competencies for career success. Figure 24a, 24b, 24c, and 24d, represent the results of the data collected from a survey of graduating seniors in 2015 (n=41) and 2018 (n=21).

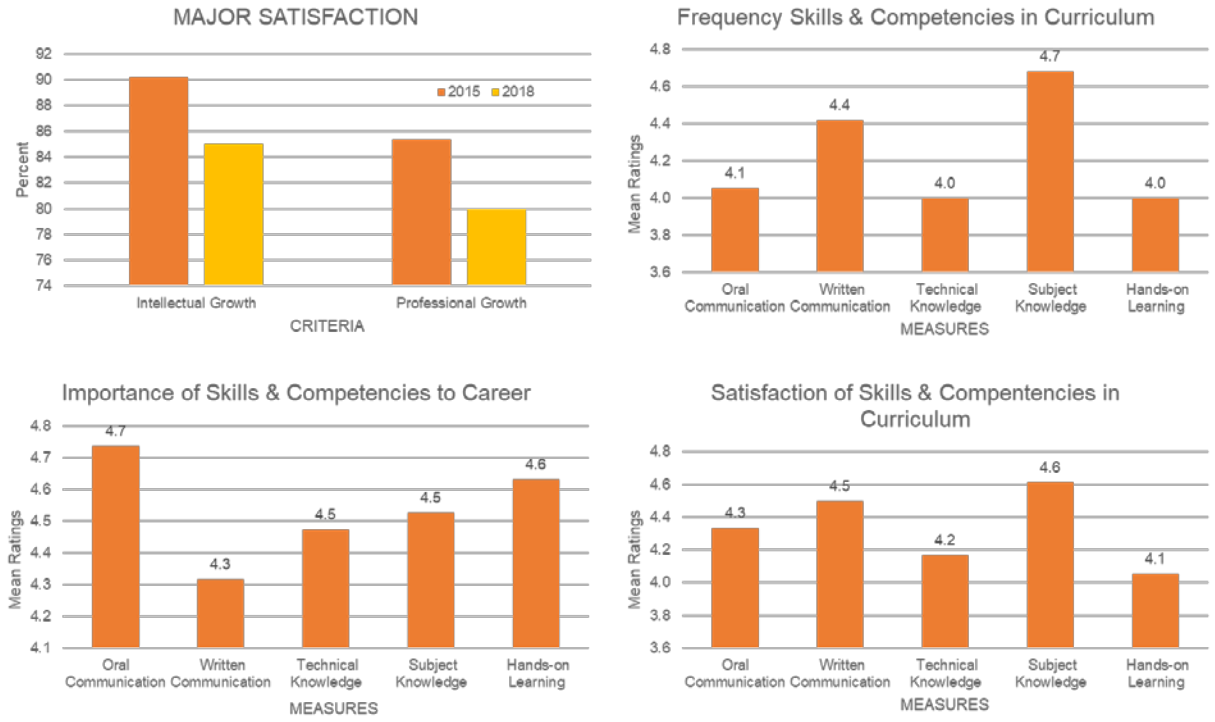


Figure 24: Undergraduate Student Survey Results

6.5.3 Student Success Center

The Department operates a Student Success Center managed by two permanent staff members. The center serves as a centralized location for students to receive academic, career, and student development assistance. The Center also houses approximately 600 internship and research opportunity files for students to explore, computers to complete homework assignments, and a lounge area for studying and fellowship. In addition, the Student Success Center has degree sheets, 4-year plans, minor requirements, program brochures, and “how-to” handbooks on resumes, cover letters, interviewing, and employer research.

6.6 Undergraduate Recruitment and Advising

The number of first semester freshmen in the Department since 2013 has ranged from a low of 65 in 2019 to a high of 145 in 2013 (Table 12). Animal Sciences majors as a percentage of total college first semester freshmen over the same time period have varied from a low of 39% in 2013 to a high of 62% in 2018 (not counting SENR numbers) and have averaged approximately 53% (not counting SENR numbers). Obviously, the retention of these students is important to the success of both the Department and the CFAES and is heavily influenced by advising.

Table 12: Number of new first-semester freshmen in the Department of Animal Sciences compared to the CFAES.

	2013	2014	2015	2016	2017	2018	2019
Animal Sciences	154	80	86	89	114	112	70
CFAES	371	157	164	171	219	135	106
CFAES w/ SENR	513	206	210	238	315	209	179

Advising within the Department and CFAES has always been a high priority activity. Therefore, students within the department have traditionally been advised by faculty, rather than by staff hired for that purpose. Steady growth in the number of undergraduate Animal Sciences majors increased the advising load of core faculty advisors to a point that was no longer manageable. The advising load of Columbus-based faculty is further impacted by the fact that faculty members located on the Wooster campus do not advise undergraduates. As a result, several staff members who have significant involvement with the undergraduate teaching program have assumed advising duties in recent years. Currently,18 tenure-track faculty members, three professional practice members, two lecturers, and two program specialists advise undergraduate Animal Sciences majors. Faculty are assigned a maximum of seven advisees per 0.10 teaching FTE. Therefore, a faculty member with a 50% teaching appointment is assigned a maximum of 35 advisees and a faculty member with a 100% teaching appointment is assigned a maximum of 70 advisees. Whereas the actual number of advisees per advisor currently varies from nine to 68 with an average advising load of 25 students. An effort is made to match students and advisors based on their discipline and species interests.

6.6.1 Co-Curricular and Extra-Curricular Activities

Undergraduates in the Department of Animal Sciences are provided many opportunities to participate in both extra-curricular and co-curricular activities. Chief among extra-curricular activities are student clubs/organizations. Most clubs accessed through the Department have some form of significant fund-raising event(s) to generate financial resources while requiring teamwork and leadership. Table 12 outlines departmental funding and endowments associated with the co-curricular teams.

6.6.2 Scholarships

The Department is fortunate to have a number of endowments that provide earnings every year to reward our undergraduate students with scholarships. In addition, there are some organizations/companies that provide annual gifts for scholarships for our students. As such, over the last ten years, an average of $114,000/year has been available to use for scholarships (Table 13).

Table 13: Department scholarship allocations

Year	Animal Science	Dairy Science	Poultry Science	Meat Science	Judging Team	Total
2010	$44,101	$34,670	$11,843			$90,614
2011	$42,705	$36,740	$23,682			$103,127
2012	$36,139	$36,936	$21,336	$43,304		$137,715
2013	$43,427	$35,647	$36,925	$32,398		$148,397
2014	$35,760	$35,098	$18,819	$29,828		$119,505
2015	$22,490	$35,264	$16,310	$12,693	$9,999	$96,756
2016	$27,666	$31,989	$17,468	$11,655	$11,415	$100,193
2017	$29,552	$35,747	$16,926	$4,313	$5,655	$92,194
2018	$36,154	$37,893	$19,577	$8,121	$4,082	$105,828
2019	$49,952	$40,214	$40,372	$9,991	$5,734	$146,265
Average	$36,794	$36,019	$22,325	$19,037	$7,377	$114,059

Funds available for scholarships fluctuate largely due to the variable earnings on endowments each year. New endowments have also been established, which contribute to the increased funding available in recent years.

Scholarships generally have stipulations that target not only the academic performance of students but also their background, interests, and emphasis areas. Within the Animal Sciences category are many other targeted interest areas such as beef, sheep, pigs, and horses. There are also a limited number of scholarships that are not strongly aligned to students with a farm animal interest, and these can be used to reward many students that indicate their species interest as companion or exotic animals. A substantial percentage of our students are aligned toward companion and/or exotic animals, and this makes the competition for these flexible funds more intense than the competition for funds aligned with dairy, poultry, or meat.

As the College and University provide substantial scholarship opportunities for recruitment, most of the scholarships available in the Department are awarded to students who have an academic record at the Ohio State University or at the Ohio State Agricultural Technical Institute. This strategy allows the department to reward deserving students based on their record at the Ohio State University.

As illustrated in Table 14, we do not totally expend all of the funds available in the scholarship pool each year. This is largely because some of the funds can be used for other purposes, such as the Top Senior Award, or for travel by the Poultry Judging Team and Meats Judging Team. The average amount of scholarships is also reported in Table 14. The Department would ideally like to see the average amount of the scholarship to be higher, as it currently is not a substantial percentage of the cost of tuition and fees.

Table 14: Departmental scholarship expenditures by year

Year	Total Available	Total Awarded	Average scholarship amount
2010	$90,614	$74,300	$1,046
2011	$103,127	$82,000	$1,205
2012	$137,715	$94,025	$1,221
2013	$148,397	$89,555	$1,297
2014	$119,505	$101,650	$1,070
2015	$96,756	$89,720	$1,107
2016	$100,193	$87,522	$1,017
2017	$92,194	$85,470	$971
2018	$105,828	$98,615	$1,038
2019	$146,265	$116,150	$1,248
Average	$114,059	$91,900	$1,122

In Table 15, outlines the number of eligible applicants, scholarships awarded, and the number of individual students receiving awards. In an effort to support as many qualified students as possible, the average size of the scholarships is less than substantial. To improve this situation in the future, we hope to have more endowments established with greater flexibility in allocating them to deserving students with non-traditional interests.

Table 15: Departmental scholarship applicants and awards

Year	Number of Applicants	Number of scholarships awarded	Number of students awarded	Percentage of applicants receiving scholarships
2010	Not Available	71	60	Not available
2011	Not Available	68	56	Not available
2012	203	77	73	35.96%
2013	142	69	65	45.77%
2014	206	95	89	43.20%
2015	200	81	75	37.50%
2016	217	86	76	35.02%
2017	212	88	77	36.32%
2018	187	95	80	42.78%
2019	190	93	80	42.11%
Average	194.63	82.30	73.10	37.56%

6.6.3 Honors Program

Admittance into the Honors program is a competitive process. There is no minimum set of requirements for entering first-year students. Factors considered in the Ohio State's Honors admission process include a strong academic record with demonstrated analytical and critical thinking skills, enriched extracurricular and/or work experiences, and broadening personal or professional experiences. To graduate in the Honors Program, a 3.4 CPHR or above is required as well as completion of the Individual Honors Curriculum and the Honors Project. The Honors

project is a research project developed within the student's interest areas following consultation with the supporting faculty research mentor.

While the implementation of the University Enrollment Services strategic plan led to a reduction in entering Honors Affiliates, Animal Sciences students continued to represent 60 to 80% of new Honors Affiliates within the College between 2012 and 2019. Animal Sciences Honors students also represent the majority of active Honors students within the college, exceeding 50% of the total between 2012 and 2019. Between autumn 2012 and spring 2019, Animal Sciences Honors courses had a combined total enrollment of 252 students.

6.6.4 Undergraduate Research

For over 15 years, the Animal Sciences department has fiscally supported undergraduate research, independent of Honors curricular requirements. Annually, eight to 12 stipends are available to non-honors students to explore the disciplines of animal sciences through experimentation. Two-thirds of the stipend is covered by the Animal Sciences department and the remaining 1/3 of the stipend cost is covered by the faculty research mentor. The program is competitive, with less than 50% of applicants accepted (Table 16). Student participants are required to present their research findings at the College Undergraduate Research Forum and may earn academic credit.

Table 16: Undergraduate Research Applications

Year	Number of Student Applicants	Number of Students Accepted (%)	Number of Faculty Participants
2012	31	13 (42)	8
2013	40	11 (28)	6
2014	37	11 (30)	6
2015	21	9 (43)	6
2016	31	10 (32)	8
2017	26	10 (38)	8
2018	Data not available		
2019	37	10 (27)	8

Forty-one percent and 43% of graduating seniors responding to a student survey in 2015 and 2018, respectively, reported participating in undergraduate research. In 2018, 23% of students of all ranks reported participating in undergraduate research (includes both Honors and non-Honors research). Further, 32% of students reporting participation in undergraduate research indicated they had submitted a research thesis to the university's repository for scholarly works, and 53% of students reported presenting their research at university or regional research competition. Animal Sciences students represent a significant percent of the total participants in the College Undergraduate Research Forum.

6.6.5 Internships

All undergraduate students in CFAES must complete one internship for credit, thus it is part of the requirement for respective majors. Additional internships are encouraged, but only one is taken for credit. Complete details can be found in Appendix 10

Some recent changes in the internship program include: 1) the University changed the policy whereby when certain courses, including 3191 courses, cause the student to go over 18 cr hr. within a semester, additional tuition is not charged to the student. This has provided more flexibility for when credit is received for an internship without extra tuition being incurred by the student. 2) Due to liability risks, students are now expected to be enrolled in a course on every occasion they are engaging in academic activity. This has necessitated for students to be enrolled in a course when they are on an internship during the summer. Thus, the College has developed an FAES 3191 course for 0 cr hr. in which the student is expected to enroll, regardless of when the internship is taken. This facilitates the College collecting data on-site of internship that must be provided in annual reporting. The student then enrolls in ANIMSCI 3191 for the 2 cr hr. for their major. Enrolling in the 0 cr hr. College course meets the requirements of the University, yet reduces the tuition and fee costs to students.

6.6.6 Study Abroad

The CFAES has established a college-wide goal of having at least 50% of its students participate in an organized international experience (study abroad, international research, international internships, etc.) before graduation. The Department of Animal Sciences has embraced this goal and has become a leader of international education activities in the College. For example, the CFAES offers 20 study abroad options; of these, six are organized and coordinated by faculty and staff in Animal Sciences with assistance from the CFAES Study Abroad Coordinator and the Ohio State Office of International Affairs (OIA) (Appendix 11).

6.7 Planned Curricular and Programmatic Changes

The Academic Affairs Committee leads the Department in recommending changes to the academic program. This Committee meets monthly during the autumn and spring semesters. Some key items that will be addressed by the Committee over the next few months include:

1. Evaluate enrollment in Animal Science courses to suggest consistently low enrollment courses be removed from the curriculum.
2. Due to the consistently low number of students in the Meat Science major, removal of this major will be considered and if it is removed, we will develop a meat science specialization within the Animal Science major, similar to the animal industries and bioscience specializations that already exist.
3. Changes are being proposed in the BS Nutrition major to move some of the required courses into electives to provide more flexibility in the major with the anticipated outcome of an increased number of students in the major.
4. The Department is in the process of developing a poultry science minor in response to the many career options available in the poultry industry.
5. New assessment plans are due which are described elsewhere in this document.
6. The Department continually provides feedback on the new General Education curriculum being developed by the University and the Department will begin soon to modify our majors to align with and make up the deficiencies with the new GE. The new GE may be in place by 2022.
7. Along with the changes associated with the new GE, the Department will be reviewing the curriculum requirements for all of our majors.

8. At present, it appears that the College will remove the requirement of the contemporary issue but keep the requirement for an internship. The new GE will reduce the required number of basic science courses and the second writing requirement must be embedded within the major. Therefore, the adoption of the new GE will necessitate a change to the structure of our majors and will likely cause a reduction in enrollment for some of our already approved GE courses.

6.8 Technology Integration

In keeping up with industry trends and standards, the integration of technology both in the classroom and within animal agriculture practices is front of mind for the Department. As was mentioned earlier in the document, efforts have been made to update and integrate technology into the facilities both for classroom and hands-on teaching purposes. This includes the addition of distance learning technologies in our newly remodeled classroom in Plumb Hall as well as the robotic milking and feeding system to be installed at Waterman Dairy.

In addition, efforts are being made to increase the availability and diversity of courses available to students through distance and hybrid methods that keep the hands-on nature of the degree in mind while providing a level of flexibility and technology that the students desire. Courses that have been made available through distance learning include;

1. 2200.01 Introductory Animal Sciences, taught by Pasha Lyvers-Peffer
2. 2200.03 Animal Systems, co-taught by Ana Grum and Mike Cressman
3. 2260 Data Analysis and Interpretation for Decision-making, taught by Mike Davis
4. 3130 Principles of Animal Nutrition, taught by Pasha Lyvers-Peffer
5. 3150 Principles of Genetic Improvement, taught by Mike Davis
6. 3140 Principles of Animal Systems Physiology – being prepared by Ben Wenner for Spring Semester

Additional courses will be reviewed for inclusion in distance learning as the efficacy of the current course offerings is evaluated for student success.

6.9 Response to Recommendations in 2011 Self-Study (Students and Educational Programs)

Recommendation 1) Be sure quality and time commitment to advising are formally recognized in the merit evaluation system. **Response**: The department chair has started using a “teaching time tabulator”, to assist with annual reviews. This tool helps quantify not only classroom and lab teaching time but also counts advising and extracurricular activities. (A copy of this tool can be found in Appendix 12)

Recommendation 2) Identify and teach classes with high enrollment potential – animals in society, animal welfare courses, meat science course for consumers. **Response**: We are investigating the development of an “Animals and Society” theme for the new General Education core. We have offered our “BBQ Science” class for a number of years now. Enrollment is solid but has not helped grow our Meat Science major as we had expected it might. The Animals in Society as a second writing course, introductory course and animal physiology as University natural science courses, and our contemporary animal issues courses

have helped to bolster enrollments from non-majors. However, this will be impacted by changes in the curriculum in the new GE.

7 Graduate Student Education

7.1 Graduate Program Summary

Graduate students in the Department of Animal Sciences have species-specific interests related to food production agriculture in the areas of nutrition, reproductive physiology, mammary health and biology, growth and development, microbiology, and fermentation biology with the focus of the Department historically being nutrition. There has been a recent increase in the number of students with an interest in the welfare of food-producing animals and the sustainability of agriculture production systems. There is also a growing interest by prospective graduate students with a focus on companion and non-domesticated animals. Currently, the Department has 38 graduate faculty members (this is the official number of graduate faculty we have listed with the Ohio State Graduate School, which includes faculty from outside the department who can serve on Animal Sciences graduate committees) and 37 graduate students.

7.2 Graduate Curriculum

In the graduate curriculum, there is an emphasis on gaining expertise in the student's area of research via coursework throughout the University. Graduate students have specific course requirements to fulfill programmatic expectations for completion of the M.S. and Ph.D. degree requirements.
A student working toward completion of the MS degree must earn 30 semester hours post-completion of their baccalaureate degree. A Ph.D. student must earn 50 hours post-completion of their MS degree (80 post-completion of BS program requirements). For Ph.D. students, of the 50 credit hours required (beyond the 30 from an MS degree), 30 credit hours must be course work. If the MS is an Ohio State degree, 15 credits of course work beyond the MS degree are required.

The courses required are highly dependent on the area of research, previous coursework the student has completed, and the career goals of the student. The curriculum is suggested by the advisor, with input from the student, and is subsequently assessed by the Graduate Advisory Committee members for the student's program.

While there are several courses throughout the University and the Department focused on nutritional biochemistry, statistics, and microbiology; physiology courses for animal science graduate students are lacking on campus and students often need to go outside of the department or even the University to fulfill the physiology needs for their graduate program. To alleviate this, Department faculty members with expertise in reproductive physiology are in the process of developing a graduate-level reproductive physiology course in conjunction with Pennsylvania State University that would be team-taught during the Fall semester. The goal is for this course to be available by Autumn 2020. In addition, there has been dialogue with the University of Wisconsin regarding a collaborative graduate course in animal physiology.
All students are required to complete AS 7789 Nutrition Research Design, at least one statistics course, and are also expected to enroll and participate in a seminar course every semester (excluding summer).

7.3 Graduate Student Opportunities and Accomplishments

Animal Sciences graduate students are encouraged to join the Animal Sciences Graduate Student Association (ASGSA), an organization that represents graduate students in the study of the animal sciences. The objective of the organization is to provide and promote communications and relationships within the field of animal sciences. The organization holds fundraisers, conducts community service events/activities, and hosts visiting scientists for professional development opportunities several times throughout the year.
Graduate students are encouraged to travel and participate in research meetings and conferences related to their area of study. In 2018, the department's graduate students produced 17 publications, three national, one regional, and one local oral presentation as well as one International, three national, one regional, and one local poster presentation. In 2019, the total number of publications and presentations jumped from 31 to 37.

7.4 Rankings and Assessment

At this time, no new information on the Graduate program's national ranking has been published since the NRC Rankings published in 2010. However, within Ohio State, additional focus has been occurring on the assessment of our graduate programs. For the MS and Ph.D. programs in the Department of Animal Sciences, each degree program currently has four learning goals, three of which are shared between MS and Ph.D. degrees in addition to one unique goal for each.

Shared Learning Goals

1. Learn to describe relationships of component parts of living cells and organisms and appreciate the knowledge of technology to assess these relationships in research (MS)/ the learning (Ph.D.).
2. Communicating and applying findings with background information via oral and written communications in the discipline to peers and to students' stakeholders and/or public entities.
3. Learn and remember the ethics of research and considering the value of one's research to the advancement of society.

Master of Science in Animal Sciences

1. Relate the scientific method in research efforts through:
    a. Recognition of the process of creating valid experimental hypotheses based upon learning the relevant knowledge in the area of emphasis approaches to test a hypothesis.
    b. Practice the use of applicable statistical analyses

Doctor of Philosophy in Animal Sciences

1. Understand and apply the scientific method in research efforts through:
    a. Understanding the process of creating valid experimental hypotheses based upon soundly assessing the relevant knowledge in the area of emphasis; and testing these hypotheses.
    b. Understand and perform applicable statistical analyses

As described for the undergraduate program, all assessment plans are currently in the process of having the outcomes analyzed and evaluated to determine if the learning goals, outcomes, and measures are appropriate or need to be altered. A revised plan will be due to the College in January 2021.

7.5 Graduate Student Enrollment Trends, Time to Degree, and Placement

On average, the total number of graduate degrees conferred for the past five years has remained relatively stable as shown in Table 17. 2018 appears to be an outlier with only six degrees conferred. However, this could be attributed to the entrance of the graduate students into the program. In the prior study, it was discovered that the average length of time it takes for an MS student to complete their degree is 2.4 years. With these data we have compiled for the past five years, you can see that there were 18 MS degrees conferred in 2016 and 2017 which stands to reason that since the number of MS students remained stable that these spots were refilled by new students. If trends follow their norm, we will see another uptick in degrees conferred in the coming two years.

Table 17: Graduate degrees conferred[1]

Year	Completed PhD	Ph.D., other*	Completed MS	Degrees Total
2014	5	1	8	14
2015	1	1	7	9
2016	4	0	10	14
2017	5	0	8	13
2018	2	0	4	6

[1]Ohio State only; some faculty advised students from other universities.
*OSUN students advised by Animal Sciences faculty.

Graduate student demographics have remained relatively stable over the past four years with the majority of the students being female (~70%), pursuing an MS (~65%), and of Domestic origin (~70%). These trends are shown in Table 18.

Table 18: Graduate student demographics

Year	Male	Female	Domestic	International	MS	PhD	MAS	Total Graduate Students
2015	13	19	27	5	20	12	0	32
2016	14	26	31	9	21	16	3	40
2017	10	27	31	6	22	12	3	37
2018	8	23	26	5	20	10	1	31

The Department did have an active professional master's degree (MAS) between the years of 2016 to 2018 and graduated two students (one left prior to completion). Due to low enrollment and student satisfaction assessments, the MAS degree is currently under revision and has been closed to applications for the 2019 and 2020 years.

7.6 Role of Graduate Students in Teaching

The current structure of graduate student teaching is directed by the Graduate Program Handbook of the Department of Animal Sciences, which requires at least one teaching assistant assignment for MS students and two for Ph.D. students. This is viewed as the minimum experience per student, and completion is overseen by the Graduate Studies Committee.

There is variation in-depth and quality of the teaching experience because of differences in the desire of the student to gain teaching experience and the location (Columbus as compared with Wooster campus) of the student. Students located on the Columbus campus have more access to in-class teaching opportunities compared with students located in Wooster. As more courses go online, students located in Wooster will have more opportunities for online teaching opportunities.

7.7 Inter- and Trans-disciplinary Graduate Research

The Department is involved in two interdisciplinary graduate programs that are located on campus. The Ohio State Interdisciplinary Ph.D. Program in Nutrition (OSUN) is a cooperative effort between three colleges: Education and Human Ecology; Food, Agricultural, and Environmental Sciences; and Medicine. The program was established in 1996 and currently has 42 graduate faculty members associated. There are currently eight faculty members from the Department associated with the OSUN program, including the Associate Director. From 2014 to 2018, two OSUN graduates were advised by Animal Sciences faculty. Presently, there are four OSUN Ph.D. students in the department.

There are two Departmental faculty who are members of the Environmental Sciences Graduate Program (ESGP). This program was established in 1989 with the College of Agriculture, as one of the founding colleges. It is focused on the pursuit and knowledge of the transdisciplinary field of environmental sciences. There is currently one ESGP student in the department.

The Department has provided leadership to both interdisciplinary programs. Numerous faculty members have served on graduate studies and student mentoring committees. The OSUN program coordinator has office space in the Department, and graduate students are housed and integrated with those in the regular Animal Sciences graduate program. The Department supports teaching and other service activities related to both programs (e.g., student support for research and travel and by coordination of seminar speakers), and the interdisciplinary mission is embedded in departmental administrative structure (e.g., sharing service duties, regular reporting at faculty meetings, integration of annual reports, and cooperation across fiscal units).

8 Outreach and Engagement

“Ohio State is dedicated to solving societal challenges through community-engaged partnerships with the people and institutions of Ohio, the nation, and the world”. The Ohio State University defines outreach and engagement as “meaningful and mutually beneficial collaborations with partners outside the academic community. This may include partners such as those in education, business, and public and social service”. Under this broad definition, all faculty members in the Department of Animal Sciences have a substantial commitment to outreach and engagement, regardless of their salary lines or appointments. In fact, much of the applied teaching and research conducted by Animal Sciences faculty and staff are in direct support of stakeholders (industry, agency, producer, and alumni) needs. Because such efforts are part of the Department’s fabric of daily activities, they are necessarily difficult to quantify.

8.1 Faculty and Staff Resources Dedicated to Outreach and Engagement through OSUE

Nine Animal Sciences faculty members receive partial salary support from Ohio State University Extension (OSUE), either through the Department’s direct budget line or through joint

appointments with the Departments of Food Science and Extension. OSUE currently provides direct funding for 4.81 faculty FTE in Animal Sciences. The efforts of these individuals are aided and additionally facilitated by four staff members representing 2.8 FTE. These program specialists are based in Columbus (8), Wooster (1), and Putnam County (1). Extension programs are typically species focused for delivery to targeted clientele groups; however, some programming is topical in nature for more broad-based delivery, e.g., animal welfare, youth development, environmental sustainability, food processing, and meat quality.

8.2 Animal Sciences Extension and the CFAES Grand Challenges

At the core of the Department's engagement in educational programs to non-academic entities is the organized educational system arising from the partnership between USDA and the land grant institutions, as defined by the Smith-Lever Act of 1914. This partnership in Ohio has been known as OSUE since the 1980s. The mission of OSUE is "We create opportunities for people to explore how science-based knowledge can improve social, economic and environmental conditions". Faculty and staff in Animal Sciences work across the program areas of youth development, farm profitability, food security/safety, health and well-being, production systems, and sustainability. The programs primarily center around the following focus groups:

Beef. There is a statewide beef team with members from Animal Sciences and county Extension offices. The group has a weekly newsletter, conducts the Beef 509 program, and organizes the annual Beef Cattle School. The team partners with the Ohio Cattlemen's Association and the Ohio Livestock Environmental Program for conducting events. They also have been very instrumental in the development of educational videos readily made available through their web site.

Dairy. There is also a statewide dairy working group that meets monthly via conference call and at least once annually in person for planning for the year and to visit a dairy facility. The group publishes a bi-monthly e-newsletter, plans statewide programs, produces videos for placement on its own YouTube channel, and regularly writes weekly articles in the Farm and Dairy newspaper. For many years, the Department hosted an annual Dairy Day event, but this had not been done for many years until autumn 2019. The event was held in Wooster to introduce new faculty, address industry issues, and showcase improvements in the Krauss Dairy.

Equine. Many of the educational programs in equine are focused on youth development and include events offered at the Ohio State Fair, Quarter Horse Congress, and many state-level programs held on campus or otherwise. At least 10,000 youth are reached annually by the Animal Science equine program. In addition, through the Regional Information Network System (REINS) and direct contacts, many adult learners are reached annually.

Meats. Ohio has the second greatest number of small meat processors in the USA, and considerable focus has occurred in recent years on helping youth and adults understand meat quality from hoof to rail. Annual programs include food safety, including Hazard Analysis and Critical Control Point (HACCP) training, meat and poultry labeling, meat processing, and youth meat judging.

Swine. Faculty and staff in Animal Sciences assist in conducting programs in conjunction with the Ohio Pork Congress, Swine Health Symposium for veterinarians, the Food Animal Handling for First Responders program, Pork Quality Assurance Plus program, and the Ohio State Fair. They also are involved in providing leadership to the Livestock Mortality Composting program.

Sheep. The statewide sheep team consists of university personnel from Animal Sciences and county Extension offices. Activities include a sheep and goat WebEx series, production and industry educational tours, Ohio Buckeye Shepherd's Symposium, the Howard Wyman Sheep Industry Leadership School, Ohio Sheep Day, animal welfare handling training, and Ohio State Fair animal events.

Youth. Faculty and staff within animal science work with the State 4-H office personnel and county staff and educators to offer many programs focused on youth development, including learning about the agricultural production system and the development of life skills. Programs are offered relating to equine, dairy, beef, sheep and goats, swine, poultry, and carcass quality. Much effort is expended on quality assurance training and providing resources to county educators for local programs. Extensive planning occurs in the development of the annual skillathons for each species offered during the Ohio State Fair and in conducting judging events for equine, livestock, poultry, and dairy cattle (see Appendix 12).

8.3 Alumni Relationships

The Animal, Dairy, and Poultry Science Departments were merged in 1994 to create the current Department of Animal Sciences. The three units engaged separate student and alumni groups prior to the merger, so it is difficult to obtain a complete profile of alumni demographics for the modern Department. The Ohio State Alumni Association and the Office of University Development maintain a database that includes nearly 7,500 living alumni from the amalgamated units. Of these, approximately 182 graduated from Poultry Science, 667 from Dairy Science, 19 from Meat Science, and 5,975 from Animal Science(s). This number is currently increasing at a rate of about 150 graduates per year. The Department clearly has the largest alumni base in the CFAES (~10% of 33,282 alumni from the Columbus campus.), and many of these individuals now provide leadership not only to the animal industries but to the agricultural community as a whole.

For 42 years, the CFAES has maintained an awards program to honor the accomplishments and service activities of its most distinguished graduates and supporters, and the Department has actively participated in this effort. Over the past decade, the College has named 75 Distinguished Alumni, of which 21 (28%) were from Animal Sciences. It has also provided 37 Young Professional Achievement Awards, of which eight (22%) were Animal Sciences graduates; 19 International Alumni Awards, of which seven (37%) were from the Department; and 23 Meritorious Service Awards, of which five (22%) were nominated by Animal Sciences. In addition to this College-wide effort, the Department of Animal Sciences has maintained a Dairy Science Hall of Service Award and an Animal Sciences Hall of Fame Award, both of which are presented annually to distinguished supporters of the dairy and other animal industries in Ohio. Since 1952, 105 individuals have been inducted into the Dairy Science Hall of Service, and 78 awardees have been added to the Animal Sciences Hall of Fame since 1909.

In the autumn of 2007, the Department began publishing *The Ohio State University Animal Sciences e-Newsletter* on a regular basis (at the end of each semester) to highlight activities and events with a general focus on undergraduate student programs. This was the first and, currently, only broad-based effort to communicate directly with alumni since the merger of the three departments in 1995. Additionally, alumni are reached through departmental social media (Facebook, Twitter, and Instagram), although they are not the only audience. While advice is commonly sought from select alumni on major programmatic matters (e.g., curriculum, faculty hires, leadership decisions) the Department has no organized alumni group to support recruitment activities, fundraising, public relationships, etc. However, faculty and student groups frequently utilize alumni as guest speakers and for expert advice.

8.4 Response to Recommendations in 2011 Self-Study (Outreach and Engagement)

Recommendation 1) Appoint team co-chairs – one from campus-based faculty and one from the field. **Response:** The department has added an additional Associate Department Chair for Teaching and Outreach.

Recommendation 2) Maintain housing of the youth program specialist in the Department of Animal Sciences where the resources reside to assure a science-based youth education program in animal food products, food animals, food, companion animals and horse. This will help assure that the youth specialist remains a subject matter specialist. **Response:** The department continues to house two youth program specialists (Share and Stutzman). The Share position was recently moved from the 4-H Office back to Animal Science where it was several years ago to provide greater interaction with animal science faculty and staff with whom they regularly work.

Recommendation 3) An animal welfare/well-being person is needed in a teaching and extension position. It is recommended the position be primarily focused on education with a minimum research responsibility. The research effort should be in collaboration with others to enhance study measurements of animals rather than an independent research program. **Response:** The department hired Monique Pairis-Garcia in 2015 to fill this position. She left to take a faculty position at the University of North Carolina in 2019. The department has reposted this position and hopes to hire a new faculty member in 2020.

9 Infrastructure

The Department of Animal Sciences' physical footprint is made up of Columbus- and Wooster-based offices, classrooms, laboratory facilities, and animal units. Research herds of beef cattle and flocks of sheep are also located there as well as at Eastern, and Jackson. A separate swine herd is located at Western. Field facilities and fish stock for aquaculture research are available through the South Centers, located in Piketon, OH. Relative locations of these facilities are demonstrated in Figure 25.

These facilities provide convenient locations, equipment, and animals for research, teaching, and outreach but are also a major concern. The animal units, in particular, weigh heavily on the Department as a necessary but costly resource to maintain, especially as facilities age. Those in Columbus also occupy land that is periodically threatened by sale or other uses (sale of two plots of Animal Sciences land in 2019 - sheep facility south of Case Road adjacent to the Don Scott airport, and Waterman Farm dairy/small ruminant pasture land on the east side of Kenny Road). Classrooms, laboratories, offices, and animal units are foundational to the functions described in this Self Study, yet their improvement or expansion is in many respects outside the direct control of the Department.

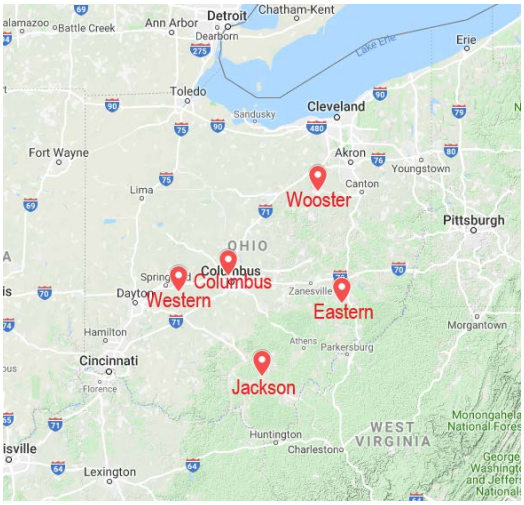


Figure 25: Relative locations of the Ohio State University, OARDC, and the OARDC branch stations.

9.1 Academic Buildings

Faculty and staff on the Columbus campus are housed in the **Animal Sciences Building** *(55,996 sq. ft)* and **Plumb Hall** *(45,947 sq. ft)*. Research laboratory areas in both buildings are shared among faculty by scientific discipline. Classrooms and arenas are scheduled, dependent on the area, under a combination of University, College, and Departmental authority. A critical need identified in the 2011 self-study was for classrooms to accommodate the increased class sizes due to increased enrollment in our majors and the conversion to a semester-based school year. Our department has remodeled two classrooms in Plumb Hall – combining them into a much-needed large lecture/interaction space. This classroom now holds up to 92 students and has the latest distance education technology, along with mobile classroom furniture that allows for rearrangement/break-out sessions within the space. It was remodeled by the department and the department has top priority for holding classes in the space.

Gerlaugh Hall *(45,919 sq. ft)* houses Wooster-based faculty and staff. Laboratory facilities in Gerlaugh include those for nutrition, physiology, anaerobic microbiology, and pathogenic microbiology research. Two smaller distance learning classrooms are in Gerlaugh, and a larger distance learning classroom is centrally administered by OARDC on the Wooster campus. These distance learning classrooms are connected to similar facilities in the Animal Sciences Building and elsewhere on the Columbus campus. To date, minimal resident instruction for undergraduate or graduate classes has been conducted via the distance learning classrooms by Departmental faculty.

Historically, Wooster faculty members have traveled to the Columbus campus for teaching due to a lack of personal connection with students during distance learning sessions and unreliability of data transfer connections between classrooms.

9.2 Laboratory Facilities

Laboratory facilities are located on both the Columbus and Wooster campuses. Laboratory space in the Animal Science Building is inadequate in terms of square footage. Plumb Hall space is adequate, but deferred maintenance issues exist in most areas. Lab space in Gerlaugh Hall is satisfactory in terms of both quality and quantity.

Table 19: Department laboratory facilities

Research	*Capabilities and Equipment*
Muscle biology	• Instruments for muscle cell culture, gene manipulation in cells and animals, gene cloning, protein purification and quantification, quantification of mRNA and protein • Facilities for experiments in general molecular, cellular, and developmental biology
Mammary	• Areas used for mammary physiology and mastitis trials include customized stalls for intensive sampling and video recording • Faculty laboratory: microscopy, protein characterization, cellular, and molecular biology • OARDC Mastitis Laboratory: microbiology, mastitis diagnostics, and milk cytology
Meat Science	• Meat Science Laboratory (Columbus) • Access to food animal species: swine, cattle, sheep, goats, and poultry • Allows studies involving harvest and sample collection, carcass composition and fabrication, fat and muscle quality assessment, chemical composition, mechanical tenderness assessment, and sensory panel capabilities
Nutritional Science	Specialized facilities at animal centers located on both campuses for nutrient digestion and metabolism
Biomass Utilization and **Microbial Ecology**	• Faculty laboratory (Columbus) • Wooster anaerobic digesters of different scales with sophisticated monitoring and controls • Laboratories for microbiology, nutrition, feed, chemistry research • Computing capabilities to model and analyze research results. • Classical microbiological methods and molecular biology techniques (e.g., real-time PCR, recombinant DNA techniques, DGGE), metagenomics, comparative genomics, proteomics, and microarrays
Genetics/ Genomics	• Columbus faculty lab: animal cell culture incubators and hood, PCR machines, Western blot equipment, and facilities for experiments in general molecular and cellular biology • Meat Science Laboratory
Physiology	• Faculty laboratories in Columbus and Wooster: equipped to handle endocrinological and molecular biology techniques such as hormone analyses by ELIZA and Radioisotopes, PCR, protein determination, immunohistochemistry, in situ hybridization, and tissue culture
Behavior	• Precision livestock equipment at animal units. Video recording hardware and analysis software.

9.3 Animal Units

The viability of the animal units at Columbus and Wooster is essential to accomplish the mission of the Department of Animal Sciences in teaching, research, and outreach education. Herds, flocks, and physical facilities are maintained by a combination of OARDC support, General Funds, revenue from the sale of products, and indirect cost return from research grants and contracts. Possible inclusion of research capabilities at the proposed Multi-Species Animal Learning Center proposed for the Waterman Farm needs to be discussed with College Administration.

9.3.1 Unit Purposes and Descriptions

Teaching. The animal units in Columbus are the physical locations for our field laboratories and are where applied learning occurs within our curriculum. All Animal Sciences majors use animal units during each school year.

Outreach. The major events hosted by animal units involving outreach education include youth events and continuing education of our stakeholders. The animal units are essential for the education of students in 4-H and FFA organizations. Student and youth tours at the animal units provide a unique opportunity for educating consumers about the process of food systems and their importance in the ecosystem.

Research. Core to the research mission of the Department of Animal Sciences is the use of animals in scientific discovery. The animal units are used by some faculty members in the Department as their primary field laboratories for conducting animal research. Areas of research conducted at the animal units include animal production systems, soil air and water quality, veterinary sciences, physiology, bio-energy, animal welfare and behavior, food safety, and innovative product development. Faculty members in Animal Sciences lead interdisciplinary research at the animal units involving each of the departments in CFAES as well as faculty in the Colleges of Education and Human Ecology, Medicine, Engineering, and Veterinary Medicine.

Figure 26 depicts the relative locations of animal units to the Columbus campus and Figure 27 depicts the Wooster campus. Each animal unit is described in Appendix 13, Appendix 14, and Appendix 15.

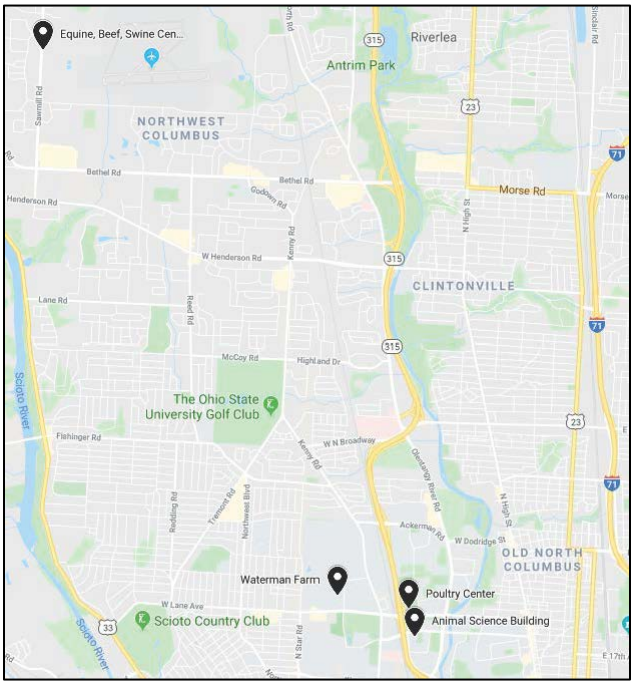


Figure 26: Columbus animal unit locations

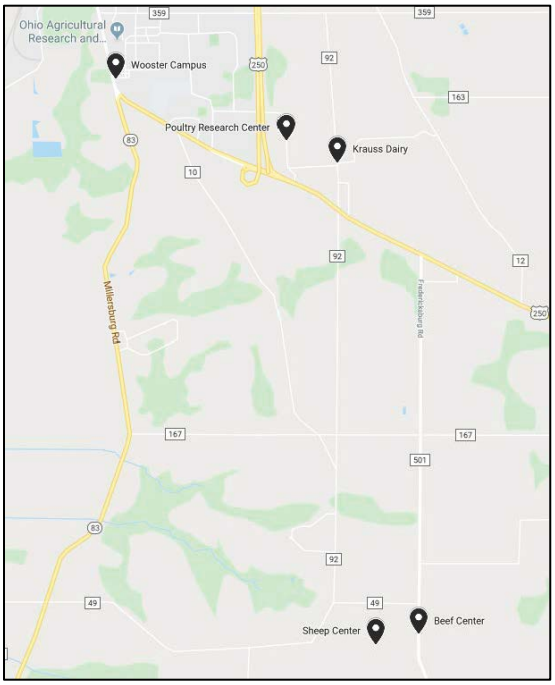


Figure 27: Wooster animal unit locations

9.3.2 Fiscal Support for Animal Units

Animal units operate on a partial revenue-generation model. Several of the department's units generate revenue (dairy, beef, sheep, and swine), while others need to be subsidized (poultry, equine) with the department covering expenses as needed. In addition, some units periodically require large capital items, which the department funds – vehicles, large equipment purchases, etc. With the creation of the Animal Unit Manager position, the department has a better handle on both personnel and facility needs across animal units.

9.4 Response to Recommendations in 2011 Self-Study (Infrastructure and Resources)

Recommendation 1) Update all older animal facilities in need of maintenance and repair.
Response: The Department has made a significant investment in upgrading and replacing facilities: Replacement of the milking parlor at the Krauss dairy in Wooster; installation of flex stalls in heifer and milk cow barns at Krauss to increase cow comfort; installation of 10 fans in the tie-stall barn at Krauss; building of new concrete feed pads at Krauss and the Beef unit to handle forages more effectively; remodeling of the Wooster group beef wing into a sheep/small ruminant facility; merging the Columbus and Wooster sheep units and upgrading a warm room and sheep handling area in Wooster; installation of nipple drinkers throughout Wooster chicken and turkey facilities; HVAC upgrades at the chicken facility in Wooster.

In 2019, we invited an AAALAC accreditation team to visit all of our College and Department animal facilities, and we received AAALAC accreditation. We have received approval for $900,000 in facility and technology upgrades to our Waterman Dairy – to include robotic milking, feeding and manure handling technology and facility upgrades to free stall, calving area, ventilation, and manure handling. We are moving forward with combining our Krauss and the Agricultural Technological Institute (ATI) dairy herds, to focus on lactating animals at Krauss and raising heifers at the ATI facility. We have received approval for building a new small ruminant facility in Wooster.

The construction of a new Multi-Species Animal Learning Center (MALC) located at Waterman Farm is tentatively scheduled to break ground in Spring 2021. The facility will merge Animal Units focusing on teaching and outreach in Equine, Swine, Poultry, Beef, and Sheep. The MALC will replace several facilities including the Equine facility at Don Scott (damaged in 2012 by a wind storm) and the poultry house on Fred Taylor Drive behind the 4-H building.

10 Leadership

10.1 Administrative Situation and Impact

The department has been served by Chair John Foltz since October 2017. Dr. Maurice Eastridge has served as Associate Chair of the Department for Teaching and Outreach since June 1, 2018. Dr. Tony Parker has served as Associate Chair of the Department for Research since August 1, 2016. The department has had some instability in leadership and administration over the past decade, with the following individuals serving in chair or interim chair roles over the periods listed: Dr. Joe Hogan: Interim Chair, 2011 – 2012; Dr. Ron Kensinger, 2012-2014; Dr. Henry Zerby, Chair, 2014-2016; Dr. Bill Weiss, Interim Chair, 2016-2017.

10.2 Faculty Governance

Policy and program decisions are made in two ways: by the Department voting faculty members as a whole or by the Chair. The nature and importance of any individual matter determine how it is addressed. Departmental governance operates based on the general principle that the more important the matter to be decided, the more widespread the faculty involvement on a decision needs to be. Open discussions, both formal and informal, constitute the primary means of reaching consensus on decisions of central importance.

10.3 Pattern of Administration, Promotion, and Tenure

The Pattern of Administration, Department of Animal Sciences, The Ohio State University was approved by the Office of Academic Affairs on December 30, 2019. The primary administrative activities of the Department are conducted by the Chair, the Associate Chairs, and standing committees comprised of the Chair's Advisory Committee, Academic Affairs Committee, Graduate Studies Committee, and the Promotion and Tenure Committee (Appendix 16).

The Appointment, Promotion and Tenure Criteria and Procedures for the Department of Animal Sciences were approved by the Office of Academic Affairs on December 30, 2019. The document is a supplement to Chapters 3, 5 and 6 of the Administrative Code regarding the Rules of the University Faculty (https://trustees.osu.edu/bylaws-and-rules/university-faculty-rules), the Office of Academic Affairs Policies and Procedures Handbook (https://oaa.osu.edu/policies-and-procedures-handbook), and additional policies established by the CFAES. The document must be reviewed, and either reaffirmed or revised, at least every four years on appointment or reappointment of the Department Chair.

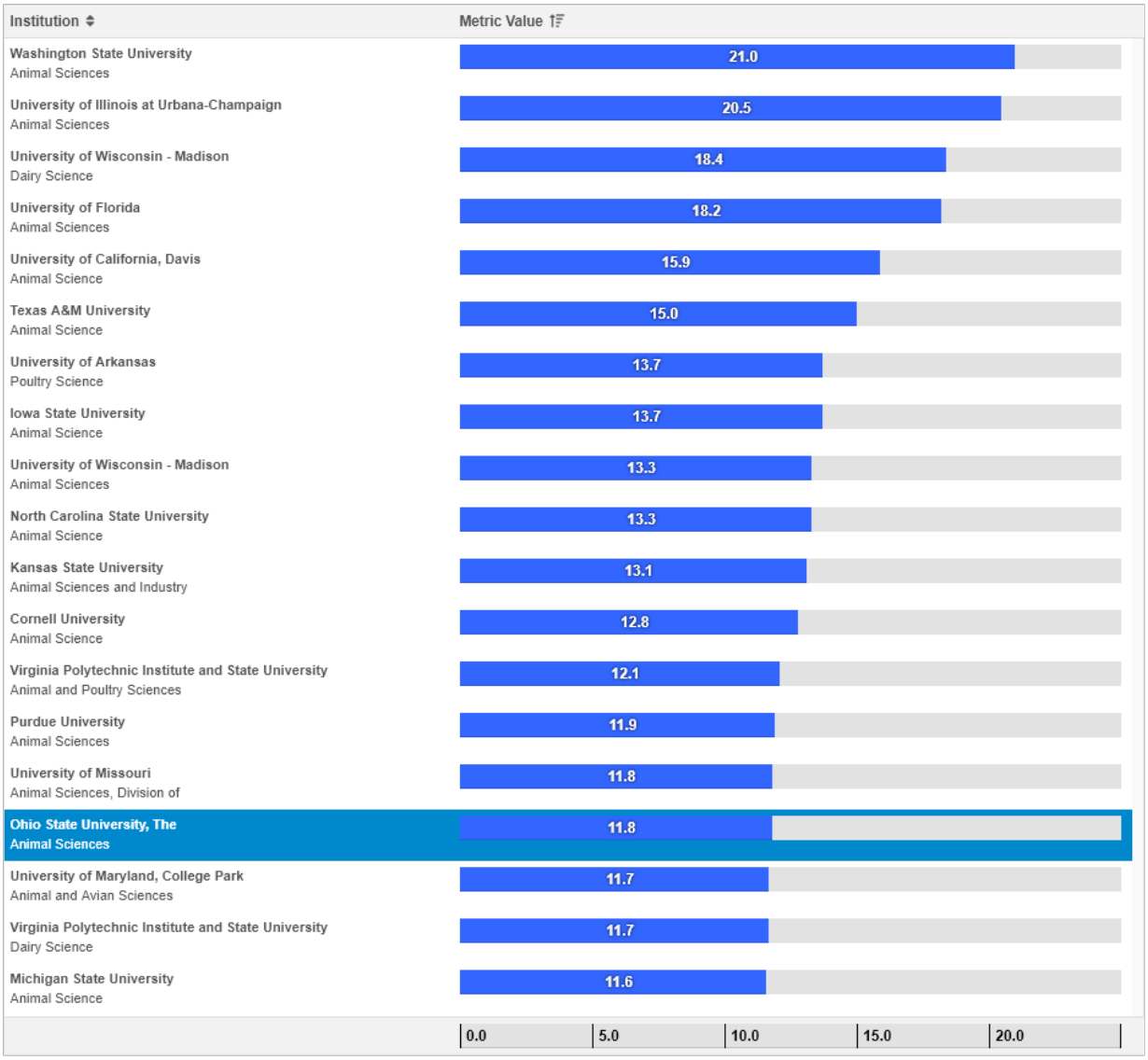
The procedures for appointment, promotion, and tenure for all Animal Sciences faculty members can be found at the following website: https://oaa.osu.edu/sites/default/files/uploads/governance-documents/college-of-food-agricultural-and-environmental-sciences/animal-sciences/Animal-Sciences-APT_2019-12-30.pdf

10.4 External Advisory Groups

The Department has not had a formal stakeholder advisory board in recent years. The large number of commodity groups and industries served by the department has historically led to an unmanageable number of members, often with conflicting interests. However, the Department has representatives on most of the primary industry boards and organizations representing our stakeholders. Stakeholder input has been actively sought by faculty and administration of the Department during their participation in local, state, and national meetings of commodity organizations.

11 Appendix

Appendix 1: Journal Articles per faculty member, produced by Academic Analytics. Comparison of Ohio State University Dept. of Animal Sciences relative to other top U.S. Animal Science departments. (As of December, 2019)



Appendix 2: Faculty and Staff Awards and Recognition

Years	Award Name	Faculty Member	Staff Member	College/University				State/Regional				National/International			
				T	R	E	S	T	R	E	S	T	R	E	S
2011	CFAES - Outstanding Academic Advisor		Mariette Benage	X											X
2012	ADSA -American Feed Industry Association Award	Jeffrey Firkins											X		
2012	OARDC Junior Faculty Award	Kichoon Lee			X									X	
2012	Ohio Agricultural Hall of Fame	Bobby Moser													X
2012	Ohio State Fair Hall of Fame	Bobby Moser											X		
2012	National Lamb Feeders Association Shepherd's Crook Award	Henry Zerby													X
2012	National Lamb Feeders Association Shepherd's Crook Award		Roger High										X		
2012	Ohio Pork Council Service Award		Dale Ricker												
2013	ADSA - Nutrition Professionals, Inc. Applied Dairy Nutrition Award	Maurice Eastridge											X		
2013	American Society of Animal Science Fellows	Steve Loerch											X		X
2013	CFAES - Outstanding Academic Advisor	Kimberly Cole		X						X					
2013	CFAES - Outstanding Service to Students Award		Masa Williams						X						
2013	OSU - Human Resources: Distinguished Diversity Enhancement Award	Stephen Boyles													
2013	OSU - Human Resources: Distinguished Diversity Enhancement Award	Herbert Ockerman													
2013	North American Colleges & Teachers of Agriculture: Teacher Recognition Awards	Stephen Boyles													
2013	Fellows of the Poultry Science Association	Michael Lilburn													
2013	PSA - Maple Leaf Farms Duck Research Program	Michael Lilburn					X								
2014	ADSA - DeLaval Dairy Extension Award	Normand St-Pierre					X								
2014	ADSA - Distinguished Service Award	Donald Palmquist					X								
2014	ADSA - Elanco Award foe Excellence in Dairy Science	Joseph Hogan					X								
2014	CFAES - Outstanding Service to Students Award		Tom Katen												
2014	OARDC Senior Faculty Award	Sandra Velleman			X										
2015	American Dairy Science Association Fellow Award	William "Bill" Weiss					X								
2015	ADSA - Hoard's Dairyman Youth Development Aeard		Bonnie Ayars												X
2015	ASAS - Animal Physiology & Endocrinology Award	Michael Day													
2015	ASAS/ADSA Midwest - National Pork Board Swine Innovation Award - Abstract	Bobby Moser													
2015	CFAES - Outstanding Academic Advisor	Henry Zerby		X			X								
2015	CFAES - Outstanding Service to Students Award	Maurice Eastridge					X								
2017	Ohio State Distinguished Staff Award		Joan Jerauld				X								
2017	OSU - Council of Graduate Students Service Award	Monique Pairis-Garcia					X								
2017	North American Colleges & Teachers of Agriculture: Teacher Recognition Awards	Pasha Lyvers Peffer										X			
2018	ASAS/ADSA Midwest - Outstanding Young Animal/Dairy Scientist Awards: Extension Specialist Award	Monique Pairis-Garcia										X			
2018	CFAES - Outstanding Service to Students Award		John Lemmermen												
2018	CFAES - Rodney F. Plimpton Distinguished Young Teacher Award	Kimberly Cole		X							X				
2018	CFAES - Meritorious Service Alumni	Michael Day									X				
2018	National Mastitis Council Award of Excellence	Joseph Hogan													X
2018	PSA - Hy-Line International Research Award	Daniel Clark											X		
2018	PSA - Novus Outstanding Scholar	Lisa Bielke											X		
2018	Honorary State FFA Degrees	Lyda Garcia											X		
2018	Honorary State FFA Degrees		Gregg Fogle												X
2019	ADSA - Journal of Dairy Science Club 100	William "Bill" Weiss													X
2019	CFAES - Outstanding Academic Advisor		Masa Williams	X							X				
2019	CFAES - Rodney F. Plimpton Distinguished Young Teacher Award	Lyda Garcia		X											X
2019	OSU - Excellence in Undergraduate Research Mentoring Award	Chanhee Lee		X											X
2019	Member of the Order of Australia	Paul Hemsworth									X				
2019	Universities Federations for Animal Welfare Medal	Paul Hemsworth									X				

Appendix 3: Past and present editorial service by current Animal Science Faculty

Faculty Last Name	Activity	Term	Journal
Davis	Section Editor	2019-present	Animals
Ezeji	Associate Editor	2011-present	World Journal of Microbiology and Biotechnology
Ezeji	Associate Editor-in-Chief	2018-present	Fermentation Journal
Ezeji	Board member	2018-present	Scientific Reports
Firkins	Section Editor	2011-2012	British Journal of Nutrition
Firkins	Associate Editor	2012-2014	British Journal of Nutrition
Firkins	Section Editor	2017-2019	Journal of Dairy Science
Firkins	Senior Editor	12/2019-present	Journal of Dairy Science
Kinder	Editor-in-Chief	2017-2019	Animal Reproduction Science
Kinder	Co-Editor-in-Chief	1996-2017	Animal Reproduction Science
Relling	Section Editor, Animal Production	2017-2019	Revista de la Facultad de Agronomía
Velleman	Associate Editor	1997-2008, 2010-2016	Poultry Science
Velleman	Section Editor	2017-present	Frontiers in Avian Physiology
Yu	Section editor	2016-present	Journal of Dairy Science
Yu	Associate Editor	2014-present	Frontiers in Microbiology
Yu	Associate Editor	2013-present	International Journal of Microbiology Research

Appendix 4:Top 10 Journals of accepted publications from January 2012 to December 2019

Journal	2012	2013	2014	2015	2016	2017	2018	2019	Total
Journal of Dairy Science	7	8	8	10	4	17	16	17	87
Poultry Science	5	5	7	6	13	11	5	9	61
Journal of Animal Science	9	4	4	5	7	9	10	4	52
Bioresource Technology	3	5	4	2	3	1	2	0	20
Animal Production Science	0	0	1	2	6	2	2	0	13
Small Ruminant Research	0	2	0	2	1	4	3	0	12
Animal Feed Science and Technology	0	0	0	2	3	2	0	3	10
Frontiers in Microbiology	0	0	0	3	2	1	2	2	10
PLOS One	0	2	2	3	0	2	0	0	9
Meat Science	1	0	2	1	2	1	1	0	8

Appendix 5: Faculty Departures

Employee Group	Full Name	Faculty Transaction Description	Started	Left	Reason for Departure	Disciplinary Impact
Tenure Track Faculty	Bielke,Lisa R	Tenure Track Hire	2015			
Tenure Track Faculty	Enger,Benjamin D	Tenure Track Hire	2018			
Tenure Track Faculty	England,Eric M	Tenure Track Hire	2015	2018	Resignation	
Tenure Track Faculty	Ferraz Dias de Moraes,Luis Eduardo	Tenure Track Hire	2016			
Tenure Track Faculty	Foltz,John Clark	Tenure Track Hire	2017			
Tenure Track Faculty	Garcia Guerra,Alvaro Garcia Guerra	Tenure Track Hire	2017			
Tenure Track Faculty	Garcia,Lyda Guadalupe	Tenure Track Hire	2015			
Tenure Track Faculty	Jacobi,Sheila Kay	Tenure Track Hire	2015			
Tenure Track Faculty	Kensinger,Ronald S	Tenure Track Hire	2012			
Tenure Track Faculty	Lee,Chan hee	Tenure Track Hire	2015			
Tenure Track Faculty	Pairis-Garcia,Monique D	Tenure Track Hire	2014	2019	Resignation	
Tenure Track Faculty	Parker,Anthony Joseph	Tenure Track Hire	2016			
Tenure Track Faculty	Relling,Alejandro Enrique	Tenure Track Hire	2015			
Clinical Track Faculty	Cressman,Michael David	Clinical Track Hire	2015			
Clinical Track Faculty	George,Kelly Ann	Clinical Track Hire	2017			
Clinical Track Faculty	Kieffer,Justin David	Clinical Track Hire	2016			
Clinical Track Faculty	Parker,Elizabeth Mary	Clinical Track Hire	2016			
Clinical Track Faculty	Wenner,Benjamin Andrew	Clinical Track Hire	2018			
Research Track Faculty	Clark,Daniel Lee	Research Track Hire	2016	2019	Resignation	
Tenure Track Faculty	Boler,Dustin Dee	Resignation		2013	Resignation	
Tenure Track Faculty	Daniels,Kristy Marie	Resignation		2014	Resignation	
Tenure Track Faculty	Day,Michael Lee	Retirement		2015	Retirement	
Tenure Track Faculty	Hogan,Joseph Scott	Retirement		2016	Retirement	
Tenure Track Faculty	Kensinger,Ronald S	Resignation		2015	Resignation	
Tenure Track Faculty	Lilburn,Michael Snell	Retirement		2019	Retirement	
Tenure Track Faculty	Loerch,Steven C	Retirement		2014	Retirement	
Tenure Track Faculty	Mahan,Donald C	Retirement		2012	Retirement	
Tenure Track Faculty	Martin,Linda C	Resignation		2017	Resignation	
Tenure Track Faculty	Moser,Bobby Dale	Retirement		2013	Retirement	
Tenure Track Faculty	Ockerman,Herbert Wood	Retirement		2017	Retirement	
Tenure Track Faculty	Selvaraj,Ramesh Kumar	Resignation		2017	Resignation	
Tenure Track Faculty	St-Pierre,Normand R	Retirement		2016	Retirement	
Tenure Track Faculty	Zerby,Henry Nevin	Resignation		2017	Resignation	
Research Track Faculty	Fluharty,Francis Lee	Retirement		2018	Retirement	

Appendix 6: Animal Science Faculty International Activities

Faculty Last Name	**Country**	**Formal Collaboration (joint appointment, etc.) and/or Sponsor, if applicable**	**Research or Teaching Activity (brief description is optional)**	**Year(s)**
Boyles	Israel	United States Livestock and Genetic Export Council	Invited talks and cattle diet evaluations	2017
Boyles	Mexico	Phibro Animal Health	Invited talks, personnel training in animal handling and facility design at packing plants	2018, 2019
C. Lee	Brazil		Visiting scholar student	2016-2017
C. Lee	China		Invited talk	2018
C. Lee	Indonesia		Invited talks (provided recordings)	2019
C. Lee	South Korea		Invited talks	2018
Cole	Belgium		Education Abroad	2011
Cole	France		Education Abroad	2013

Faculty Last Name	Country	Formal Collaboration (joint appointment, etc.) and/or Sponsor, if applicable	Research or Teaching Activity (brief description is optional)	Year(s)
Cole	Germany		Education Abroad	2013
Cole	Germany		Education Abroad	2011
Cole	Ireland		Education Abroad	2014
Cole	Netherlands		Education Abroad	2011
Cole	Netherlands		Education Abroad	2018
Cole	Netherlands		Education Abroad	2018
Cole	Spain		Education Abroad	2016
Davis	Canada		External panelist for research grants	2017, 2019
Ezeji	Brazil	Collaboration with Dr. Adriano Mariano (University of Campinas) on biofuels and bioproducts production	Taught a 2-day class on biofuels production	2017
Ezeji	Nigeria	Collaboration with Prof. Charles Aworh, Department of Food Technology, University of Ibadan	Taught a 5-day workshop on microbial metabolism, wastes treatment, and biofuel production	2017, 2019
Eastridge	Netherlands, Germany, Belgium		Education abroad	2011, 2014, 2017
Eastridge	Canada	Canada Vet Med. Assoc.	Invited presentation	2017
Eastridge	China	Chinese Academy of Agricultural Sciences	Education abroad	2013
Firkins	Argentina	Argentine Association of Animal Production/joint with the American Society of Animal Science	Invited presentation	2011
Firkins	Canada	University of Alberta	One presentation at the University of Alberta, another at a feed conference, examiner on a doctoral thesis	2011
Firkins	Canada	University of Saskatchewan	Invited presentations at two feed conferences (Alberta, Manitoba), a third at Univ Saskatchewan	2015
Firkins	China	China Agricultural University	Invited presentation	2016
Firkins	Denmark	Aarhus University	Invited presentation, examiner on student's doctoral thesis committee	2011
Firkins	France	Rowett/INRA Symposium on Gut Microbiology	Invited presentation	2012

Faculty Last Name	Country	Formal Collaboration (joint appointment, etc.) and/or Sponsor, if applicable	Research or Teaching Activity (brief description is optional)	Year(s)
Firkins	Netherlands	Schothorst Feed Research Institute	Invited presentation at a feed conference	2015
Firkins	Sweden	Swedish University of Agricultural Sciences	Invited presentation and external examiner on student's doctoral thesis	2018
Kinder	Australia	CQUniversity	Adjunct Professor - Invited lectures to students; Mentoring of Graduate Students	2016-2020
Kinder	Australia	Animal Welfare Science Centre	Research and Scholarly collaborations	2002-2020
Kinder	Australia	Fulbright Scholar Host - Mark Trotter	Research and Scholarly collaborations	2019
Kinder	Vietnam	Embryo In Vitro Fertilization - Dr. Van-Huong	Research and Scholarly collaborations	2016-2020
Moeller	Australia	Collaboration with Drs. Paul Hemsworth, Grahame Coleman, and colleagues at the Animal Welfare Science Centre.	On-going development and delivery of ProHand Pigs; continued involvement in Welfare Science Initiatives with Ohio State as a contributing partner in the Animal Welfare Science Centre programs.	2012 - present
Moeller	Denmark	Led Ohio Swine Industry Tour of Danish and Dutch swine farms and university research stations. Hosted Dutch research scientist for Ohio Pork Congress Symposia speaker engagement	Presentations on US swine production, research discussions related to swine welfare initiatives and alternative production practices that may be implemented in the US.	2018
Moeller	Netherlands	Led Ohio Swine Industry Tour of Danish and Dutch swine farms and university research stations. Hosted Dutch research scientist for Ohio Pork Congress Symposia speaker engagement	Presentations on US swine production, research discussions related to swine welfare initiatives and alternative production practices that may be implemented in the US.	2018
Moeller	South Africa		Education Abroad	2014, 2015, 2016, 2017, 2018, 2019
Moeller/George	Chile		Education Abroad	2011
Moeller/George	Greece		Education Abroad	2014
Moeller/George	Ireland		Education Abroad	2010, 2012, 2016, 2018

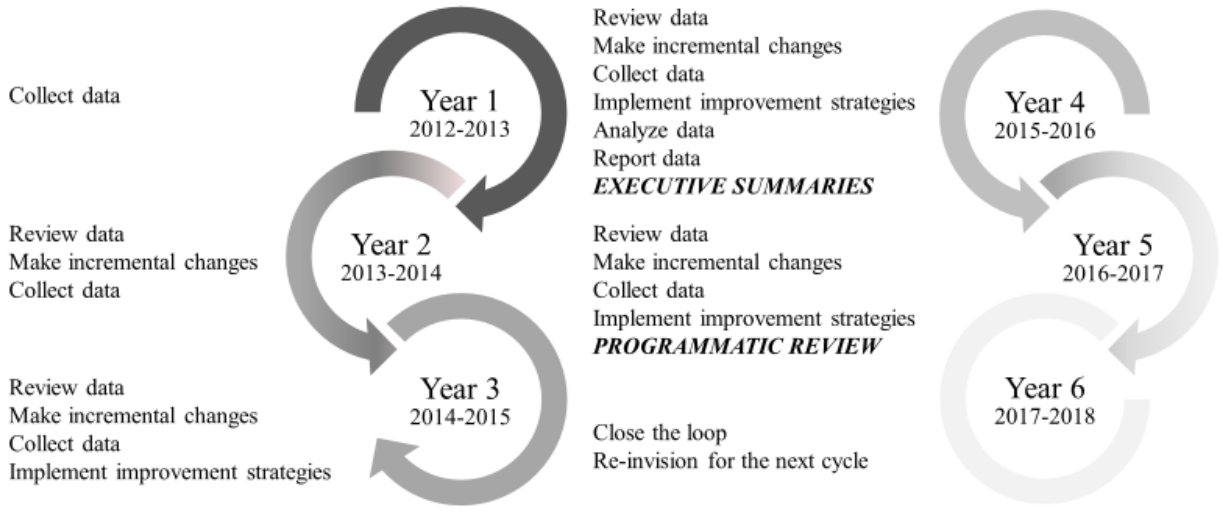
Faculty Last Name	Country	Formal Collaboration (joint appointment, etc.) and/or Sponsor, if applicable	Research or Teaching Activity (brief description is optional)	Year(s)
Moeller/George	Italy		Education Abroad	2019
Moeller/George	New Zealand		Education Abroad	2013, 2017
Moeller/George	Spain		Education Abroad	2017
Parker E	Australia	Collaboration with Dr. Louise Edwards, Ridley Agriproducts.	Retrospective analysis of Salmonella monitoring data. Social Network analysis of the feed mill industry in Australia	2016-present
Parker E	Australia	Dr. Kevin Doyle, Public Health Chapter of the Australian and New Zealand College of Veterinary Science	Invited Speaker, 3 presentations on environmental antibiotic resistance at the "Science Week" conference	2018
Parker E	Rome Italy	Collaboration with Dr. Jeff LeJeune, Food and Agricultural Organization of the WHO	Expert meeting on antibiotic residues in the environment	2018
Relling	Argentina	Guess Lecturer	Teaching: 40-hour course in feedlot nutrition at the University of Villa Maria.	2019
Relling	Argentina	Research Collaboration with Dr. Mattioli at La Plata National University.	Research collaboration, hosting graduate students, writing a grant proposal, and publications	2017-present
Relling	Argentina	Guess lecturer	Teach a 3-day course in small ruminant nutrition at La Plata National University	2015-present
Relling	Brazil	Collaboration with Dr. Evandro Ferreira, Department of Animal Science, University of Sao Paulo, Piracicaba	Research collaboration, the publication of a manuscript as a result of it.	
Relling	France	Collaboration with Dr. Cantalapiedra-Hijar.	Research collaboration, in energy efficiency in feedlot cattle	2018-present
Relling	Mexico	Collaboration with Dr. Hector Lee-Rangel and Dr. Juan Pinos-Rodriguez	Hosting Mexican graduate students for externship; collaboration on research projects, preparation, and presentation of an abstract to ASAS meeting, and publication of the results.	2018-present
Velleman, Sandra	Australia	Australian Poultry CRC grant	Funded research and training of a doctoral student from the University of Sydney, Dean Powell	2010-2014

Faculty Last Name	Country	Formal Collaboration (joint appointment, etc.) and/or Sponsor, if applicable	Research or Teaching Activity (brief description is optional)	Year(s)
Velleman, Sandra	Australia	Australian Poultry CRC grant	Research grant	2014-2016
Velleman, Sandra	Israel	USDA BARD grant; collaborative authors on manuscripts and a book chapter in preparation	USDA BARD grant	2013-present
Velleman, Sandra	Italy	co-editor at University of Bologna	Special research topic eBook	
Velleman, Sandra	Taiwan		Invited presentations	2004
Weiss	Argentina		Teach a 5-day workshop on dairy nutrition, Univ. Rio Quarto	2016, 2018, 2020
Weiss	Argentina		Teach 5-day workshop on dairy nutrition, La Plata Univ	2015,2017, 2019
Weiss	Brazil		Teach a 5-day workshop on dairy nutrition	2015
Weiss	Brazil		Invited talks	2017, 2018, 2019
Weiss	Canada		invited talks	2016, 2017, 2018
Weiss	China		Guest lecturer (dairy nutrition class) Hunan Ag. University	2015
Weiss	China		Invited talks	2016, 2017, 2018, 2019
Weiss	Columbia		Invited talks	2019
Weiss	Costa Rica		Invited talk	2016, 2018
Weiss	Hungary		Invited talks	2018
Weiss	Jamaica		Teach a 3-day workshop on dairy nutrition	2017
Weiss	Mexico		Invited talk	2017
Weiss	Netherlands		Invited talks	2018
Weiss	Peru		Invited talk	2015
Weiss	Spain		Teach in MS program, Univ Zaragoza	201, 2018, 2020
Weiss	UK		Invited talks	2016,2018, 2019
Wick	Macedonia	Fulbright Scholarship	Visiting Scholar	2013
Wick	Macedonia	Fulbright Specialist Fellow	Visiting Specialist Member Organizing Committee International Symposium for Agriculture and Food	2017-2020

Faculty Last Name	Country	Formal Collaboration (joint appointment, etc.) and/or Sponsor, if applicable	Research or Teaching Activity (brief description is optional)	Year(s)
Wick	Nigeria	World Bank grant	Develop and present Molecular Biology workshop	2011
Wick	Poland	International Symposium on Food Science and Technology	Invited presentation	2012
Yu	Canada		External panelist for research grants	2011, 2012, 2013, 2015, 2016, 2017
Yu	Chile		External panelist for research grants	2011, 2012, 2013, 2015, 2016, 2017
Yu	China		invited talks	2011-2019, once yearly
Yu	China		Taught a 5-day workshop on metagenomics	2018, 2018
Yu	China		Taught a 4-day course on Rumen Microbiology	2019
Yu	China		Hosted visiting graduate students and faculty on sabbaticals	2011-2019, 2-4 yearly
Yu	Czech		External panelist for research grants	2011, 2012, 2013, 2015, 2016, 2017
Yu	Denmark		External panelist for research grants	2011, 2012, 2013, 2015, 2016, 2017
Yu	Germany		Invited talk	2011
Yu	India		Hosted visiting graduate students and faculty on sabbaticals	2011-2019, 2-4 yearly
Yu	Ireland		External panelist for research grants	2011, 2012, 2013, 2015, 2016, 2017
Yu	Ireland		Invited talk	2013
Yu	Kazakhstan		External panelist for research grants	2011, 2012, 2013, 2015, 2016, 2017
Yu	Malaysia		Hosted visiting graduate students and faculty on sabbaticals	2011-2019, 2-4 yearly
Yu	Malaysia		Invited talks	2012
Yu	Philippines		Hosted visiting graduate students and faculty on sabbaticals	2011-2019, 2-4 yearly

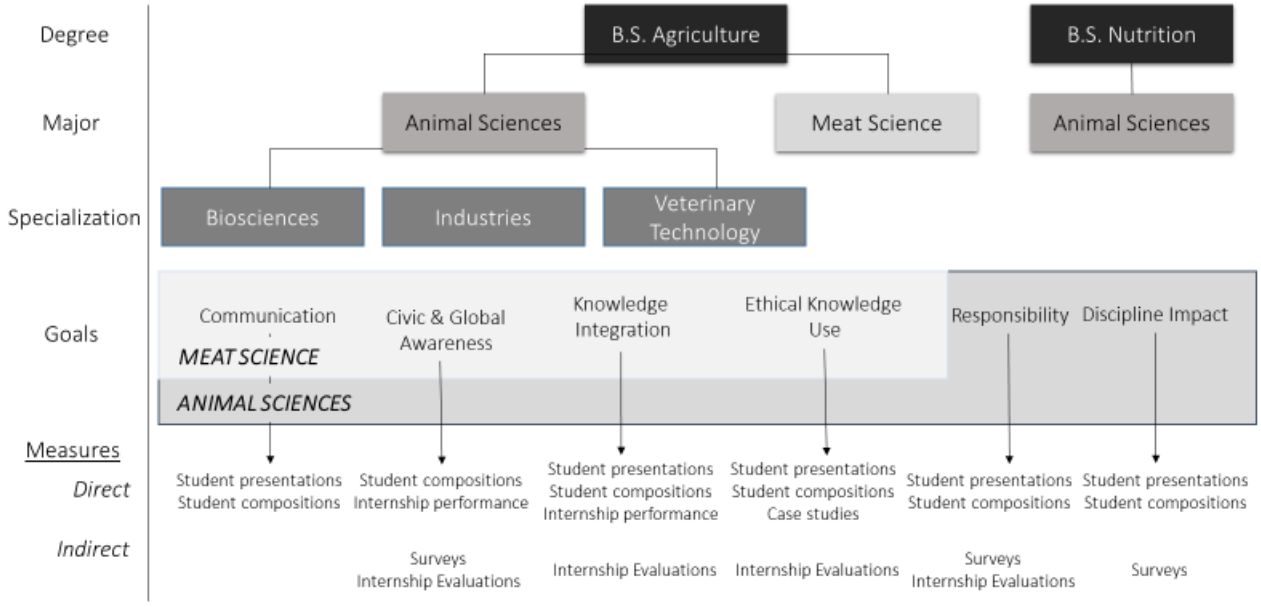
Faculty Last Name	Country	Formal Collaboration (joint appointment, etc.) and/or Sponsor, if applicable	Research or Teaching Activity (brief description is optional)	Year(s)
Yu	South Korea		Invited talks	2013
Yu	Thailand		Hosted visiting graduate students and faculty on sabbaticals	2011-2019, 2-4 yearly
Yu	Thailand		Invited talks	2011
Yu	UK		External panelist for research grants	2011, 2012, 2013, 2015, 2016, 2017

Appendix 7: Programmatic assessment model, approach, and actions



Programmatic assessment model, approach, and actions.

Appendix 8: Undergraduate program infrastructure, associated programmatic learning goals, and assessment measures.



Undergraduate program infrastructure, associated programmatic learning goals, and assessment measures. The goals of communication, global awareness, knowledge integration, and ethical knowledge use are shared between the Meat Science and Animal Sciences majors. Additional goals of civil duty and discipline impact are specified to the Animal Sciences major.

Appendix 9: Departmental co-curricular teams

Activity	Coach	Purpose	Department Funding	Funding ($) Endowments	Development
Academic Quadrathlon	Faculty	Designed to test students' comprehensive knowledge of animal sciences.	$2,000/yr.		
Dairy Challenge Team	Faculty	Provides students with an opportunity to evaluate management practices on a dairy farm and to interact with representatives in the dairy industry	$2,000/yr.		
Dairy Judging Team	Staff	Provides students experience with judging dairy cattle at up to eight separate contests	$2,000/yr.	$105,000 yielding $4,900/year	
Livestock Judging Team	Staff	Students analyze animals and measure them against an ideal standard in multiple contests	$2,000/yr.	$678,000 yielding $23,021/year	$31,000/year
Meats Judging Team	Faculty or Staff	Students learn how meat products are evaluated, fabricated, and marketed in multiple contests	$2,000/yr.	$547,750 yielding $14,964/year	$5,000/year
Animal Welfare Judging Team	Staff	Students learn how to assess the welfare of animals in a variety of settings using science-based methods and reasoning.	$2,000/yr.		

Appendix 10: Internship requirements

The internship can be paid or non-paid and must be up to 200 hours of work to receive 2 cr hr. Students are not permitted to complete this internship for an employer for which they previously have worked. Each student must complete an Internship Agreement Form, sign it, have the employer sign it, and then the academic advisor must sign it. The work hours can't begin to be counted until 10 days after the Internship Agreement Form is signed by all parties. At the completion of the internship, the supervisor is provided an Internship Evaluation Form that must be completed, reviewed with the student, and then both the student and employer sign it. The signed form is then provided to the academic advisor for review and discussion with the student. Advisors can have additional expectations that must be described to the student prior to beginning the internship. The advisor must then assign a grade for ANIMSCI 3191 at the conclusion of the respective academic period. Students can receive credit for ANIMCI 3191 during any academic period, but most students complete their internship in the summer and receive the credit for ANIMSCI 3191 during the autumn semester. Potential internships are provided in the Student Success Center, provided in consultation with academic advisors, provided within the weekly student email newsletter sent by the undergraduate program coordinator, through the Handshake program provided by CFAES for employers to post opportunities, and through the CFAES career expos held in the autumn and spring semesters. Most of the students will complete an internship within Ohio; for example, in 2018, 83% of the students completing an internship did so within Ohio and the other 17% were mostly completed in neighboring states.

Appendix 11: Animal Science Department Study Abroad Options

Destination	Topic	Frequency/Duration	Description	Credit
Varied by year: Ireland, Netherlands, Germany, Belgium, France, Spain	European Equestrian Studies	2 years/10 days	Equine industry and how it is shaped by culture and economics in Europe	1 SP/3 SP
Varied by year: Netherlands, Germany, Belgium, France	European Dairy Science	3 yr./2 weeks	Political, economic, and social framework of the dairy industry in Europe	1 SP/3 SU
Varied by year: Ireland, New Zealand, Thailand, Greece, Spain, Chile	Human and Animal Interactions	1 yr./10-12 days	Political, economic, cultural, physical, and social differences regarding interactions between humans and animals used for various purposes	2 AU/3 AU
Scotland	Direct Enroll: University of Glasgow FEEPASS	1 student per year/full academic year	Technical and professional development of upper-level undergraduates who will remain in Scotland to complete their DVM equivalent. Students complete BS via 1st year vet school courses and graduate during the summer term after their first year in Scotland.	12 AU/12 SP
South Africa	Exotic Animal Behavior and Welfare	1 yr./2.5 weeks	A safari through parks and refuges where they study wild animal behavior and welfare by observing animals in their native habitat.	3 AU or SP/3 SU
Scotland	Small Ruminants of Scotland	1 yr./10-12 days	Examine small ruminant heritage breeds of Scotland. Tour and lectures at the University of Glasgow School of Veterinary Medicine. Explore Scotland's history, myths, and beautiful landscapes.	3 SP

Appendix 12: Faculty Teaching Time Tabulator

Faculty Teaching Time Tabulator

Please fill in only the shaded areas -- enter the number of units for each semester for each activity -- % time will be calculated automatically

Name: _____ **% Teaching Appointment** _____

ACTIVITY		Credit Hr	% Effort	# Students	# Students	Factor[7] 9 mo	Factor[7] 11 mo	Fall UNITS	Fall % TIME	Spring UNITS	Spring % TIME
Lecture instruction credit hours (includes lecture/lab combined classes)[1]:	Course				Factor (Table 1)	No	Yes				
Fall						4.16	3.33	0.0	0.0		
						4.16	3.33	0.0	0.0		
						4.16	3.33	0.0	0.0		
Spring						4.16	3.33			0.0	0.0
						4.16	3.33			0.0	0.0
						4.16	3.33			0.0	0.0
						4.16	3.33			0.0	0.0
Laboratory instruction credit hours [2]:											
Fall						4.16	3.33	0.0	0.0		
						4.16	3.33	0.0	0.0		
Spring						4.16	3.33			0.0	0.0
Number of guest lectures by this instructor[3]:						0.12	0.10		0.0		0.0
Number of students enrolled in Ind Study courses with this instructor[4]:						0.96	0.77		0.0		0.0
Number of interns supervised by this instructor[5]:						0.60	0.48		0.0		0.0
Number of undergraduate advisees assigned to this instructor (MAJOR):						0.20	0.20		0.0		0.0
Number of undergraduate advisees assigned to this instructor (MINOR):						0.02	0.02		0.0		0.0
Number of undergraduate honors/research project students advised[6]:						0.96	0.77		0.0		0.0
Number of M.S. non-thesis students advised (serve as major professor):						1.26	1.01		0.0		0.0
Number of M.S. thesis students advised (serve as major professor):						1.56	1.25		0.0		0.0
Number of Ph.D students advised (serve as major professor):						2.10	1.68		0.0		0.0
Number of graduate student advisory committees (serve as member):						0.15	0.12		0.0		0.0
Number of co-curricular clubs/groups advised						0.78	0.63		0.0		0.0
% Teaching Time (semester)									0		0
Grand Total (full year)						0					
Classroom						0					
Advising/Mentoring						0					

Table 1. Factor for # students

# UG	Factor	# GRAD
<9	**0.67**	
9-14	***0.83***	0-6
15-39	***1.00***	7-12
40-89	***1.16***	13-25
>90	***1.33***	>25

Factor weightings for lecture courses only

New Course ***add 0.50***

GE ***add 0.25***

[1]Enter the # of cr hr for 'units'; include Discussion section(s) here but not including Ind. Study, internships, thesis, etc. When more than one instructor is assigned, work load credit is proportioned and not to exceed total cr hr for the course when turn taught; for team taught courses, combined workload credit hours may exceed total cr hr assigned to a course up to 2 times the courses credit value and is weighted by a factor of student # proportioned across instructor numbers [for example, for a 2 cr hr course taught team taught by 2 instructors with an enrollment of 20, each instructor may be assigned a work load credit of 2, weighted by a factor of 0.83 for 10 students per instructor].

[2]Enter total work load units for lab sections taught. Work load units are 0.5 credit hours per each lab contact hour. For a 2 hour of contact, the work load

[3]Enter "1" for each 55 min lecture, 1.5 for each 80 min lecture (calculated per Factor conversion assume 3.33 for 12.5 hr; 0.5 hr contact per hr lecture as no student commitment (grading, etc.)

[4] *Enter "1" for each student enrolled in 3488 or 4193 courses*

[5] *Enter "1" for each student enrolled in 3191 courses*

[6] *Enter "1" for each student (students may or may not be enrolled in 4999 or 4999H courses)*

[7]Place "Yes" and "No" correctly in columns for 9 vs 11 month appointment and equations will update. Factors are based on a published study.

Appendix 13: Ohio State Junior Fair: Animal Sciences Youth Participation

Ohio State Junior Fair
Animal Sciences Youth Events Participation

	2005*	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
SKILLATHONS															
Beef	109	126	116	114	111	111	93	102	73	93	123	127	121	148	132
Dairy	94	71	75	61	56	122	122	123	115	129	108	166	142	153	150
Dog	392	339	208	162	175	164	179	175	171	164	161	178	148	156	140
Goat	46	52	44	47	67	58	59	67	71	74	70	103	114	127	120
Horse	227	245	181	158	197	169	193	143	131	158	155	199	206	190	163
Poultry	70	82	80	86	95	106	99	104	94	94	109	92	99	117	139
Rabbit	158	141	123	102	97	110	106	119	119	117	122	116	113	120	134
Sheep	180	156	183	155	144	148	142	150	151	148	148	161	193	187	174
Swine	185	168	181	172	167	172	174	210	218	218	208	212	198	228	219
Total	**1461**	**1380**	**1191**	**1057**	**1109**	**1160**	**1167**	**1193**	**1143**	**1195**	**1204**	**1354**	**1334**	**1426**	**1372**
OUTSTANDING MARKET EXHIBITORS															
Beef	61	65	74	74	60	54	74	72	51	49	51	54	58	60	41
Goat											32**	50	48	39	45
Poultry	43	30	38	39	43	48	49	44	33	33	N/A***	30	30	57	43
Sheep	87	55	88	118	65	61	129	99	60	116	40	36	36	37	42
Swine	66	78	95	99	95	85	161	100	83	184	60	61	67	71	63
Total	**257**	**228**	**295**	**330**	**263**	**248**	**413**	**315**	**227**	**382**	**183**	**231**	**239**	**264**	**234**
JUDGING OPPORTUNITIES															
Dairy (Contest)^						137	124	137	144	171	132	121	106	132	114
Dairy (OSF Clinics)	45	66	92	52	45	100	115	67	67	193	73	165	124	133	120
Livestock	124	113	106	120	102	115	99	87	111	72	135	143	153	188	203
Horse	190	164	102	129	143	157	186	177	106	88	129	156	169	133	122
Poultry	73	88	60	36	35	37	45	50	38	28	N/A***	38	48	62	59
Avian Bowl											43***	53	67	57	41
Rabbit											80+	62	70	57	64
Rabbit Quiz Bowl														71	87
Total	**432**	**431**	**360**	**337**	**370**	**546**	**569**	**518**	**466**	**442**	**592**	**738**	**737**	**833**	**810**
Total Youth Participants	**1893**	**1811**	**1846**	**1724**	**1742**	**1954**	**2149**	**2026**	**1836**	**1832**	**1979**	**2323**	**2310**	**2523**	**2416**

*Skillathons were opened to all youth exhibitors and non-exhibitors at the Ohio State Fair. **Goat OME added. ***No poultry due to live ban; Avian Bowl replaced Poultry Judging.
+First year adding the rabbit judging contest to statistics. ^Dairy Judging Contest at Spring Dairy Expo sponsored, in part, by Ohio State Fair.

Appendix 14: Animal units housed by the Department

Animal Units		
Center	**Animals**	**Facilities**
Waterman Dairy	110 Lactating Jerseys	100 acres corn silage production; 24.2 acres pasture
(Campus; Columbus)		Double eight herringbone milking parlor
		Lactating cows housed in a barn with 100 free stalls; Dry cows housed in loose housing on on pasture; Tie-stall housing used for animals during
Poultry	200 egg type chickens	Battery brooder pens, cages, or floor pens
(Campus; Columbus)	100 heritage strain chickens	Teaching laboratory; Room for incubation
	200 broilers	
	40 turkeys	
	Wild type quail	
	Fast growing quail	
Beef		
(Don Scott; Columbus)	125 spring calving cows, ~30 fall calving cows;	Heifer calves are retained for research projects and replacement females
	Angus, Simmental, and Angus x Simmental	~25-35 head finished cattle utiltized by the OSU Meat Lab
		40x60 hoop barn constructed in 2012
Swine	Yorkshire x Landrace females,	24 farrowing crates
(Don Scott; Columbus)	artificially inseminated to Duroc sire line;	Grower-finish facilities for 300 animals; Nursery facilities for up to 450 animals
	100 females farrowed 8 times per year;	Small classroom/arena
	16 litters/year sired by show pig sires	
Equine	30-40 Quarter horses	Large outdoor arena; Several paddocks with turn-out shelters
(Don Scott; Columbus)	2 Donkeys	Hot/cold wash rack
		28 box stalls; 2 large foaling stalls equipped with cameras; 2 large
		Breeding lab; Classroom with seating for 50 students
Krauss Dairy	~120 Lactating registered Holsteins	Lactating cows in a 144-free-stall barn or 48-tie-stall barn; 14 box stalls in maternity and calving barn; Calves raised in hutches
(Wooster)		6 digestion stalls
		Double eight parabone milking parlor installed in 2019
		Consolidation of Krauss and ATI dairies expected to be completed by August 2020 (not sure if this should be included yet)
Poultry Research	Many genetic lines of chickens	>36,000 square feet of housing for experimental birds
(Wooster)	Random bred line of turkeys	Turkey Farm has hatchery, battery pens, floor pens.
		Chicken Farm has a pullet building, meat bird building, and laying
		Nipple waterers installed in 2018
Beef	Capacity of 80 head of cattle	80 small pens for feeding cattle individually
(Wooster)	~150 head of small ruminants	Converted 12 group housing pens into housing for small ruminants
Sheep/Goats	200 ewes; predominantly crossbred flock, Hampshire and Dorset	63 acres permanent pasture; 30 acres of tillable ground for intensive grazing research
(Wooster)	30 Boer does, 25 doelings and 4 Boer bucks	Total confinement building and complete feeding system to utilize silages, haylage and stover
		Te Pari sheep drafter installed in 2019 to allow handling and
		Warm room for lambing/kidding completed 2019

Appendix 15: Research Stations descriptions

Research Stations		
Western (South Charleston)	50-60 Berkshire sows	Farrow 4x/year
		19 regular farrowing crates, 12 turn around crates
		Grower-Finish facilities for 600 animals; Nursery facilities for up to 225 animals
Eastern	350-400 spring calving cows Angus & Simmental influence	100-130 heifer calves are retained for replacements and research
	300 Dorset crossbred ewes	150-200 finished cattle marketed yearly
		24 Grow safe units installed in 2016
		Feedlot upgrades completed in 2019
		Sheep flock is split between spring and fall lambing
		100 ewe lambs are retained each year
Jackson	150 spring calving cows, Angus, Simmental x Angus influence	~40 heifers are retained for replacements
	60 registered spring lambing Katahdin ewes	Calves are used for finishing research projects or marketed through stockyard
		Lambs are pasture finished
		Covered manure storage building completed in 2014

Appendix 16: Grace Drake Lab at ATI Animal Units

Grace Drake Agricultural Lab at ATI (Agricultural Techinical Institute)		
Beef	100 Fall calving cows	Heifers are retained for replacements
	Angus, Murray Grey, Angus x Simmental x Hereford crosses	~50 finished cattle marketed yearly
		200 acres of pasture
		Templin Grandin handling facility completed in 2013
Dairy	50 Lactating Holsteins	Double eight parallel milking parlor
	47 Lactating Jerseys	30 acres rotationally grazed pasture for heifers
		Free stall barn houses pre breeding, breeding and bred heifers and all milk cows
Swine	Yorkshire, Berkshire, Duroc, Landrace and Crossbreeds	6 Farrowing crates
	18 sows farrowed twice per year (Spring and Fall)	24 stall gestation barn
	1 boar used for collecting and breeding	Nursery capacity for 160 animals; Finisher capacity up to 50 animals
		Two new swine modular units used for Farrowing and Gestation installed in 2017
Equine	3 Stallions	46 Stall barn, includes foaling stalls, tack room and wash rack
	19 Broodmares	Fully equipped breeding laboratory
	21 Lesson horses	100' x 210' outdoor riding arena; 85' x 185' indoor riding arena
	7 weanlings and 3 yearlings	

Appendix 17: Department administration structure

Activity, Structure	Role(s)	Duties	Term	Appointment
Chair of Department	Administrative head of Department	Represents Departmental faculty in dealings with university administration	4-year (subject to annual review performance)	Nominated by President of the University
				Appointed by Board of Trustees
Associate Chairs of Department (1 for teaching and 1 for research)	Oversight of Departmental Research, Teaching, and Outreach	Assists Chair with administrative duties	Concurrent with chair	Appointed by Chair
				Approved by Dean and by his/her cabinet
Chairs Advisory Committee	Advisory group to Chair on all Departmental matters	Determines use of royalty and patent feed	3-year rotating	Elected by eligible voting faculty
A. Associate Chair				Represent salary lines of OARDC, OSUE, and GF
B. 3 Regular Faculty				
Academic Affairs Committee	Supports undergraduate education program	Develops and maintains Departmental undergraduate		
A. *Undergraduate* Coordinator	Voting member	Chair Academic Affairs Committee		Appointed by Chair
B. *Coordinating* Advisor	Voting member	Assigns advisors & leads recruitment		Appointed by Chair
C. *3 Regular Faculty*	Voting members		3-year rotating	Elected by eligible voting faculty
D. *Undergraduate Representative*	Non-voting member		1-year	Appointed by Chair
E. *Student Services* Coordinator	Non-voting member			Ex-officio
Graduate Studies Committee	Reviews applicants into Departmental graduate program	Reviews courses and curriculum issues		
A. Committee Chair (must be P graduate faculty status)	Voting member		3-year	Elected by eligible voting faculty
B. 3 Graduate Faculty members	Voting members		3-year rotating	Elected by eligible voting faculty
C. Department Chair or Associate Chair(s)	Voting member			
D. Graduate student representative	Non-voting member		1-year	Elected by graduate students
Promotion and Tenure Committee*	Reviews and drafts detail analysis of dossiers (P&T, P, and 4th year reviews)	Leads discussion of dossiers with eligible		
A. 3 Full Professors	Voting members		3-year rotating	Elected by eligible voting faculty
B. 2 Full Professors	Voting members		2-year rotating	Appointed by Chair (used to balance
C. Department Chair	Non-voting member			

**Committee Chair and procedural oversight member are elected from voting members of P&T committee.*

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