

Teaching/Undergraduate and Graduate Education: Graduate and Undergraduate Teaching

586 Gender has a substantial impact on student success in introductory animal science courses. C. G. Jackson*¹, B. J. Williams², and E. P. Berg¹, ¹North Dakota State University, Fargo, ²Hutchinson Community College, Hutchinson, KS.

The demographic populations of animal science courses at land-grant institutions have changed in the last 20 years. More female and urban students are filling the chairs of agricultural classrooms. The objective of this study was to determine the effect of agricultural background and gender on determining student success in introductory animal science courses. Students enrolled in Introduction to Animal Science 114 (n = 150) and Livestock Production 220 (n = 69) from the spring and fall semesters of 2011 were included in the study. There were more females (n = 134) compared with males (n = 85) and as expected, freshman (n = 93) represented the majority followed by sophomores, juniors, and seniors (n = 56; n = 35; and n = 34; respectively). Each participant completed a survey consisting of 22 questions. Questions pertained to demographic information and their exposure to agriculture during their youth; whether it was participation in 4-H or FFA, showing livestock, or if they grew up on a farm/ranch. More than half of the students grew up on a farm/ranch (n = 127) and were involved in either 4-H or FFA (n = 113). Less than half of the students (n = 75) grew up showing livestock. Females finished the courses with greater semester percentage scores (final grade = 86%) compared with their male counterparts (80%). Female freshman received grades that were greater ($P \leq 0.02$) than both freshman and sophomore males. Additionally, females who participated in 4-H and FFA as well as those who did not performed better ($P \leq 0.05$) than males who were involved in both 4-H and FFA. Furthermore, females who did not show livestock had increased ($P \leq 0.04$) performance compared with males with showing and non-showing experience. Females not from a farm/ranch had greater ($P \leq 0.04$) success than males who grew up on a farm/ranch. Also, non-farm/ranch students had increased ($P \leq 0.03$) performance compared with those who grew up on a farm/ranch. Student gender was the largest factor influencing student success in introductory courses to animal science, for females performed greater than males regardless of agricultural background.

Key Words: animal science, gender, teaching

587 Meeting the changing needs of animal science majors. G. M. Hill* and J. E. Link, *Michigan State University, East Lansing.*

The composition of animal science classes has changed over time. Utilizing response clicker technology, we determined that our introductory animal science course has over 70% freshmen with 55 to 60% of students pursuing an emphasis in pre-veterinary medicine. However, the shift toward veterinary medicine is accompanied by fewer students being raised on farms. Our response technology found that 40% of today's students are from a small town, 20 to 25% are from a large city, and only 15 to 20% are from a farm of over 20 ha. Over 50% of the students reported that the animals they have the greatest contact with are dogs and cats. Hence, large agricultural enterprises are no longer the source of our animal science students. Additionally, we observed that the favorite lab for the past 5 yr was our sheep lab in which students had hands-on experience with the animals. This lab dropped out as the favorite when it was modified to an observation only lab in the spring semester of 2011.

To meet the educational needs of this current population, we renovated the course curriculum in the fall semester of 2011 to increase access to livestock and begin early development of basic livestock skills. All labs now involve visits to the university farms and handling either animals or their products (eggs, carcasses, reproductive tracts). Students worked directly with livestock in 71% of the laboratories compared with 7% the previous spring semester. Numerous photos were taken of students' activities to share with family and friends and to serve as study material. Data from one semester of the new curriculum indicated that laboratories with hands-on livestock experience were consistently rated higher than laboratories that were facility tours with limited hand-on experience. Students rated the following lab sessions good or very good for four vs. hands-on with animals, respectively: dairy: 89 vs. 93, poultry: 66 vs. 86, beef: 81 vs. 94, sheep: 83 vs. 90, swine: 77 vs. 84%. While this type of course takes accessible farms and dedicated managers, it appears that the needs of today's students are being met.

Key Words: undergraduate, livestock, teaching

588 Addressing agricultural and societal issues using a variety of teaching methods. E. L. Walker,* *Missouri State University, Springfield.*

To address societal issues related to agriculture a AGR 399 Animal Welfare Course was designed as a traditional 16 wk lecture type 3 credit hour course at Missouri State University (MSU). However, due to increased demand by place-bound students for quality courses, alternative teaching methods have been implemented. In the fall, 2011, AGR 399 was taught as a combined on-line and traditional 2 1/2 h live lecture course that was broadcast to an additional 5 locations via interactive television. Time was allocated during the lecture portion for invited speakers and discussions directed by student interest. Other than outside speakers, only short, non-formal discussions were planned by the instructor with most discussions being initiated by the students and moderated by the instructor allowing for student directed learning. As part of the online component, 9 PowerPoint lectures along with 1 notes were posted online using Blackboard 9.1. *Compassion by the Pound* by F. B. Norwood and J. L. Lusk (2011) was used as the text for the course. In addition, students were required to read and discuss assigned articles in 16 graded on-line discussions. One anonymous discussion was initiated so students could voice opinions they felt might not be popular. In total, there were over 1,100 posts from 25 students in a 16 wk period. The 2 reading assignments that generated the most discussion (over 80 each) covered ethics and morality. One was by S. L. Davis (Poult. Sci. 2008) *What Would the World Be Like Without Animals for Food, Fiber and Labor? Are We Morally Obligated To Do Without Them* and the other by J. Hodges (J. Anim. Sci. 2003) titled *Livestock, Ethics, and Quality of Life*. By using a variety of delivery methods, on campus as well as place-bound students have access to the class. In addition, the on-line portion of the class allows for all lectures, quizzes, exams, and homework to be done outside of a regular class period, thus allowing time for invited speakers, discussions over the readings, perusal over current event news headlines, and any topic that the students were deemed important that was related to animal welfare.

Key Words: teaching, distance education, animal welfare

589 Assessing the land-grant mission through undergraduate demographic data: A quantitative approach. S. Archibeque-Engle* and K. Pond, *Colorado State University, Fort Collins.*

Part of the mission for land grant universities is to serve and represent the state of its location. This analysis was conducted to assess the representation of the state of Colorado by its land grant university and to identify potential talent pools for educated agriculturalists within Colorado. Colorado State University's (CSU) 2010 (n = 696) and 2011 (n = 696) annual fall census data for the Department of Animal Sciences are used and presented here as a model to examine the current situation of the intersection higher education and animal sciences. First, demographics of the undergraduate populations within CSU's Department of Animal Sciences are investigated to determine the current sex and ethnic representation. Second, the current demographics of the department are compared statistically and visually with those of the state of Colorado as a measure of meeting the land grant mission to represent the state. To explore differences statistically, expected frequencies were calculated and a Chi Square Goodness of Fit test was employed to compare the ethnic percentages observed in both 2010 and 2011 for the Department of Animal Sciences undergraduate students to what is expected if the Department of Animal Sciences is representative of the state of Colorado's ethnic demographics. For both 2010 and 2011 the Department of Animal Sciences Latina/o undergraduate representation is significantly lower than expected, $X^2 = 76.6$, $\Phi = 0.33$ and $X^2 = 69.8$, $\Phi = 0.33$; the African American undergraduate representation is significantly lower than expected, $X^2 = 17.1$, $\Phi = 0.16$ and $X^2 = 9.0$, $\Phi = 0.12$; no statistical difference for the Asian/Pacific Islander group was found; for 2010 no statistical difference for the Native American group was found and in 2011, the Native American undergraduate representation is significantly higher than expected, $X^2 = 17.1$, $\Phi = 0.16$. The effect sizes found in this comparison are small to very small and are due to the small numbers of ethnic minority students in CSU's Department of Animal Sciences. In summary, CSU's Department of Animal Sciences is not representative of the ethnic demographics of the state of Colorado.

Key Words: undergraduate education, demographics, land grant

590 Student perceptions of ethics and animal intelligence influenced by introductory animal science course. A. L. Adams,* G. A. Holub, W. S. Ramsey, and T. H. Friend, *Texas A&M University, College Station.*

Instructors of introductory animal science classes are faced with a wide range of student experiences and perceptions of livestock production practices. This study examined whether these perceptions change as students acquire more knowledge and experience with different species. Students in an introductory animal science course participated in a 26-question pre-course (Pre, n = 310) and post-course (Post, n = 282) survey. Pearson correlation coefficients were used to determine if any associations occurred between responses. Pre and Post responses were analyzed using either the pooled or Satterthwaite *t*-test. Fifty-four percent of participants were first-year undergraduates, 70% were female, and 60% had not been involved in 4-H or FFA. Majority of participants were enrolled in the College of Veterinary Medicine and Biomedical Science (56%) and the College of Agriculture and Life Sciences (30%). Sixty-five percent of participants were interested in pursuing a career in veterinary medicine. Participants had the most experience handling horses (33%), but 30% of the participants had no experience handling livestock. All students considered horses (Pre = 64%, Post = 51%) and swine (Pre = 24%, Post = 44%) to be the most intelligent livestock species ($P = 0.001$). Pre and Post, participants agreed that animals have feelings (94%, $P = 0.76$) and deserve respect from humans (99%,

$P = 0.49$). Pre, only 33% of the participants stated that the news media negatively portrays agriculture, whereas, 77% of the participants shared this view Post ($P < 0.0001$). Pre, only 51% of the participants agreed that it is ethical to clone animals, but 77% of the participants agreed with this statement Post ($P < 0.0001$). These results suggest that exposure to livestock production issues and multiple livestock species may influence student perceptions of different livestock species, along with the societal and ethical issues of livestock production.

Key Words: livestock, perceptions, teaching

591 Background experience affects student perceptions of the livestock industry. A. L. Adams,* G. A. Holub, W. S. Ramsey, and T. H. Friend, *Texas A&M University, College Station.*

Demographic information of students in introductory animal science courses allows instructors to tailor content to student needs and interests. This study compared student demographics with student perceptions of livestock production practices. Students in 2 introductory animal science sections (A: n = 310, B: n = 328) participated in a 26-question pre-course and post-course survey. Pearson correlation coefficients were used to determine if any associations occurred between student responses. Pre-course and post-course survey responses were analyzed using either the pooled or Satterthwaite *t*-test. Both sections were comprised primarily of first-year undergraduate students; a majority was female with either horse experience or no livestock experience. Thirty percent of section A and 58% of section B was enrolled in the College of Agriculture. Sixty percent of section A and 40% of section B had no involvement in 4-H or FFA. Sixty-four percent of all participants were interested in pursuing a career in veterinary medicine. Pre-course, 61% of section A considered horses to be pets, 63% of section B considered horses to be livestock ($P < 0.0001$), 55% of section A stated media portrays agriculture without bias, and 56% of section B stated media negatively portrays agriculture ($P = 0.0004$). Both sections agreed that weather has the greatest influence on producer success ($P = 0.0003$) and genetically-modified foods are safe for consumption ($P = 0.003$), with more variation occurring in section B. Fifty-three percent of section A and 44% of section B believed slaughterhouse practices are inhumane ($P = 0.02$). Post-course, more of section A than section B considered horses as livestock ($P = 0.005$), and both sections agreed that media negatively portrays agriculture, weather has the greatest influence on producer success, genetically-modified foods are safe for consumption, and slaughterhouse practices are humane (all $P > 0.05$). These results suggest that students with no livestock experience may view agriculture differently than students with experience, but more exposure to livestock production issues may challenge students to evaluate their views of agriculture.

Key Words: experience, livestock, student

592 Beef production student instructional video project. C. L. Pickworth*^{1,3} and S. Boyles², ¹*The Ohio State University, Wooster*; ²*The Ohio State University, Columbus*; ³*North Carolina State University, Raleigh.*

Changes in information technology directly affects today's beef producers. Developing means to provide fast, accurate information to these producers is a challenge that many extension educators face. To help address this need, students enrolled in the Beef Production II class at The Ohio State University Agricultural Technical Institute were challenged to develop and produce educational videos about basic beef management techniques. Students were randomly assigned to 6 groups and each group selected a topic from a list provided by the Ohio Beef Team extension

educators. Students then were responsible for developing a script, filming and editing, the cattle management video. Extension educators worked with students to ensure accuracy of information and the educational value of materials. Student-developed videos were filmed using Flip Cam video cameras and edited with the associated software. Videos were evaluated for value of content, accuracy of information, and quality of visual attributes by the course instructor, extension educators, and peers within the course. Upon completion of the assignment, students were asked to evaluate the effectiveness of the video project. On a scale of 1 to 6 (1 = improved understanding or agree, 6 = detrimental to understanding or disagree), students favorably evaluated the educational value of this team video project. This project helped enhance teamwork (1.54 ± 0.78), knowledge of beef industry (1.62 ± 0.87), understand the difficulty of communicating beef management tasks (1.38 ± 0.51), and was valuable to the course (1.38 ± 0.65). Greatest limitations of the project included access to video cameras, inability to merge separate video and audio files, and having ample time for extension educators to review video clips before final video was developed. Copyright of the videos were provided to The Ohio State University by the students to allow extension educators the ability to use the movies they created in part or whole for extension education. Engaging students in video production on beef cattle management techniques can connect students with extension educators and enhance extension education resources.

Key Words: beef production, extension education, video

593 Integrated program for reducing bovine respiratory disease complex (BRDC) in beef and dairy cattle, coordinated agricultural project (CAP): overview of the teaching program. M. G. Thomas^{*1}, G. R. Hagevoort², T. T. Ross², R. M. Enns¹, H. Van Campen¹, A. L. Van Eenennaam³, H. L. Neibergs⁴, C. Chase⁵, S. V. Dindot⁶, N. D. Cohen⁶, and J. E. Womack⁶, ¹Colorado State University, Fort Collins, ²New Mexico State University, Las Cruces, ³University of California, Davis, ⁴Washington State University, Pullman, ⁵South Dakota State University, Brookings, ⁶Texas A&M University, College Station.

Bovine respiratory disease complex is a common cause of morbidity and mortality in cattle, especially young animals exposed to stress. This disease is considered a complex because of numerous involved pathogens. The research objective of this CAP is to use genomic approaches to identify host chromosome regions associated with susceptibility to BRDC and then translate results to beef and dairy industries via selective breeding tools and increased awareness of the need for disease prevention and management (<http://www.brdcomplex.org/>). The translational effort is supported by teaching and extension efforts. Objectives of the teaching effort include: 1) develop 2 nationally accessible distance-learning courses on the integration of animal health management with genomic and animal breeding approaches (i.e., Improvement of BRDC Resistance and Animal Health and Genetic Approaches to Disease), 2) develop an undergraduate summer research internship program, 3) develop a veterinary feedlot and dairy internship program, 4), sponsor graduate and undergraduate students to attend the Southern Great Plains Dairy Consortium-Teaching (SGPDC-T), where research components of the project are ongoing, and 5) develop 4-H curriculum to expose and train youth on animal disease using BRD as an example application. The educational component of this CAP is greatly assisted because its activities are organized with infrastructure of established and collaborating programs, SGPDC-T; (<http://sgpdct.tamu.edu/>) and Breeding and Genetics Graduate Education Online (<http://bggeo.iddl.vt.edu/>). The internship programs are integrated with the research program as students are involved in animal and tissue sampling and data collection. This CAP is in the second year of a 5-year effort and welcomes additional student

participation, especially students from under-represented minorities. In summary, the education component of the BRDC-CAP (USDA-AFRI 2011-68004-30367) is developing and offering distance and experimental multi-disciplinary learning approaches for undergraduate, graduate, and veterinary students studying BRDC.

Key Words: cattle, disease, genomics

594 Why your school should host a Block and Bridle National Convention. M. W. Orth,* Michigan State University, East Lansing.

Good communication, leadership, and problem solving skills are qualities we desire to see mature in our students. In the classroom, mastering disciplinary content is the primary objective. However, extracurricular activities such as clubs can facilitate the development of soft skills. In animal science departments, Block and Bridle (at some schools Saddle and Sirloin) is the club that includes students with interests in several livestock species. Besides participating in many local activities, each year a school or group of schools will host a National Convention that is open to all clubs across the country. Getting schools to commit to the undertaking has been difficult in the past few years. Michigan State University hosted the National Convention in the fall of 2010 for the first time in its history. Hosting a convention requires a tremendous amount of energy over several months. They are expensive to fund and require a lot of coordination with a very diverse group of people. However, the benefits for the students are well worth the effort. Organizing a convention requires a wide range of activities to make it successful. Students at Michigan State had to develop written materials, such as a sponsorship brochure and convention program, organize bus tours all around the state, stock buses with food and drinks before 6 a.m., and resolve conflicts quickly to name a few. Two unexpected benefits were the greater involvement of members in the club throughout the entire year and the initiation of the Sparty Farm Fresh Tour, a one-day bus tour designed to expose new students to animal agriculture in Michigan. With employers putting a greater emphasis on soft skills in hiring decisions, animal science departments must encourage activities to develop those skills. Hosting a Block and Bridle National Convention is one extremely effective activity that will help prepare a large number of students for their future professions. Additionally, it will showcase agriculture in your state and provide a lot of lasting memories.

Key Words: soft skills, block and bridle, student development

595 Enhancing the student learning experience through an undergraduate research program. E. L. Karcher* and N. L. Trotter, Department of Animal Science, Michigan State University, East Lansing.

Between fall 2009 and 2011, enrollment in the Department of Animal Science at Michigan State University (MSU) increased by 11.6%. This increase was accompanied by curricular change including a requirement for undergraduate students in Animal Science to participate in an experiential learning activity. Based on a perceived growing interest in undergraduate research, the Animal Science Undergraduate Research Student Association (ASURSA) was established in fall 2009. Three main learning outcomes were identified: 1) to engage students in annual group undergraduate research projects, 2) to increase general understanding and proficiency of the scientific method, and 3) to provide a forum for professional and social interaction. In spring and fall 2011, club members were identified to work with advisors to formulate a proposal and serve as project managers. Students submitted multiple grant applications and were successfully awarded \$10,950 in funding.

During this process, bi-weekly club meetings were used as a forum to discuss the rationale for the project, steps of the scientific method, and discussions on the importance of animal care and use forms. In spring 2011, 18 ASURSA members conducted the first research project at the MSU Poultry Teaching and Research Center. In January 2012 a second study involving 29 members was initiated at the MSU Dairy Teaching and Research Center. Project managers were responsible for leading discussions at club meetings. Discussion topics included nutrition and diet formulation, rationale behind key laboratory techniques, and project updates. Communication of results included presentations by students at MSU and scientific meetings and submission of an article to *Poultry Science*. In addition to research, members host the MSU Animal Science Undergraduate Research Forum. This forum, initiated in 2009 by club members, offers students conducting research in animal science an opportunity to present their work to both students and faculty. In conclusion, the development of an undergraduate animal science club focused on research has offered a unique opportunity to engage a large number of students in research. This coincides with a time of increased student enrollment and increased desire by students to participate in undergraduate research.

Key Words: education, undergraduate research, experiential learning

596 Implementation of a capstone experience requirement in animal and poultry sciences. C. M. Wood,* D. M. Denbow, E. A. Dunnington, and R. K. Splan, *Virginia Tech, Blacksburg*.

Beginning with the graduating class of 2011, undergraduates in the Department of Animal and Poultry Sciences at Virginia Tech must complete a 2-credit capstone experience within 45 credits (3 semesters) of graduation. Each capstone experience is unique to the student who designs it in consultation with faculty. Specific learning objectives include: 1) using critical thinking skills to acquire, analyze, interpret, and integrate information from a variety of sources; 2) solving problems in authentic or realistic situations; 3) planning and completing a project pertaining to each student's discipline and field; 4) demonstrating verbal, visual, and written communication skills; 5) contributing to a team effort; 6) assessing and describing potential contributions to society; and 7) effectively competing for career and/or post-baccalaureate opportunities. An outline of the approval process was presented by Wood et al. (2008). The first proposals were approved in fall 2009. To date, 211 proposals have been approved; 55 of those are in progress and scheduled to be completed by May 2012. Internships (35% of the total) are more popular in the summer whereas formal courses (27%) are chosen most often in the spring semester. Independent studies (13%), undergraduate research (14%), and study abroad (7%) make up most of the rest. Some students (n = 7) fulfill the requirement through a semester spent in the equine program at the Middleburg Agricultural and Research Center in northern Virginia. Almost half the students participate in a poster symposium, held on campus fall and spring semesters, that highlights their

accomplishments. Grades assigned by on-site supervisors are mostly A's but a few have assigned C's and D's. Analysis of student perceptions (n = 66 students) indicated that 97% of those completing an internship achieved at least 5 of the 7 learning objectives; 49% achieved all but one and 30% achieved all 7. With more than 450 APSC majors, the challenges presented by this new requirement are many but are outweighed by the tremendous opportunities for student growth.

Key Words: undergraduate education, experiential learning, capstone experience

597 The Graduate Experience Program: An opportunity for undergraduates to explore graduate study. E. L. Berg*¹, A. M. Meyer², and L. A. Lekatz¹, ¹*North Dakota State University, Fargo*, ²*University of Wyoming, Laramie*.

The objective of the Graduate Experience Program (GEP) at North Dakota State University (NDSU) is to give undergraduate students the opportunity to explore graduate study in the animal sciences and provide mentorship opportunities for graduate students. This class is modeled after a course developed at the University of Missouri in 2006. Admittance into the class is dependent on an application and recommended GPA ≥ 3.0 and junior standing. Class discussion topics include research areas in animal sciences, the land-grant mission, searching for graduate programs, graduate program structure, professionalism, scientific reading and writing, and career options with an advanced degree. Undergraduates are paired with a graduate student mentor for one-on-one dialog and participation in their research. In addition, undergraduates are required to attend departmental seminars, complete a graduate school application, discuss a journal article, and present their future plans as a final project. Graduate student mentors are expected to explain research methods and lab techniques, keep mentees informed of research opportunities and be accessible to their mentees. Since inception of the course in 2009, 19 undergraduate and 13 graduate students have participated during 4 semesters. When asked to rate the overall quality of the course from very good (5) to very poor (1), the average response from undergraduates (n = 18) over 4 semesters was 4.1. When asked if they would recommend this course, the average response was 4.4 (strongly agree = 5; strongly disagree = 1). All students agreed that GEP was helpful in their decision to pursue or not pursue graduate study. Of the 19 undergraduates who participated, 37% (n = 7) are still completing their B.S., 26% (n = 5) are currently enrolled in animal science graduate programs, 26% (n = 5) are working in animal science-related industry jobs, 5% (n = 1) are working in non-animal science jobs and 5% (n = 1) are in veterinary school. In conclusion, the GEP helped NDSU students in the decision making process regarding pursuit of graduate school, as well as encouraged them to consider graduate study in the animal sciences.

Key Words: undergraduate, graduate