INNOVATE 2015

Innovations in Education:
An Animal Science Curriculum for the 21st Century

May 31–June 2 / Braselton, GA

Organized by the American Society of Animal Science

SAVE THE DATE

INNOVATE 2016

September 14-16

Madden's on Gull Lake

Brainerd, MN

INNOVATE 2015

Innovations in Education:

An Animal Science Curriculum for the 21st Century

WELCOME

INNOVATE 2015: Innovations in Education: An Animal Science Curriculum for the 21st Century was planned by the American Society of Animal Science (ASAS) to provide faculty and administrators across colleges and universities an opportunity to discuss teaching and learning in the animal sciences. The intimate setting is intended to broaden interaction between speakers and attendees.

The conference will focus on the curriculum, the core of a student's college experience and the means by which undergraduates are prepared for the world after graduation. It will focus on "what" is taught as part of an animal science curriculum as well as "how" it is taught. Recruitment of new students, retention of current students and student success after graduation, as affected by curricular and extracurricular matters, will also be addressed.

Innovation in education is about learning new ideas and creating something new and better for students. The academic presentations coupled with an industry perspective of student preparedness for the workplace will ensure that this conference is "innovative." The outcome might represent a new way of educating undergraduates in animal science or it might reflect a better way to use an existing curriculum and current teaching tools. Perhaps George Couros states it best in his blog, The Principle of Change: "Sometimes it (innovation) is invention (a totally new idea) and sometimes it is iteration (remix of an old idea) but it is always better." That's our hope for INNOVATE 2015.

Welcome!

Deb Aaron
ASAS President

SCHEDULE

INNOVATE 2015

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May 31–June 2 / Braselton, GA

REGISTRATION HOURS:

Sunday	**2:00 pm – 7:00 pm**
Monday	**7:30 am – 6:00 pm**
Tuesday	**7:30 am – 4:00 pm**

SUNDAY, MAY 31, 2015

2:00 pm **Registration Opens** – Elan Ballroom Foyer

5:30 pm **Reception** – Chateau Lawn

6:30 pm **Opening Session** – Elan Ballroom

Welcome to Innovate 2015
Debra K. Aaron, PhD, University of Kentucky

Keynote Address:1 Innovations in Learning
Barbara Oakley, PhD, Oakland University, Rochester, MI

MONDAY, MAY 1, 2015

7:30 am **Breakfast** – Elan Ballroom Foyer

SESSION 1: Priorities and Structures of Undergraduate Curriculums in the Animal Sciences – Elan Ballroom

Moderator: Margaret Benson, PhD, Washington State University

8:35 am Academic Perspective: The Role of the Curriculum in Preparing Animal Sciences Students for Life after Graduation
Steve Zinn, PhD, University of Connecticut

9:20 am	Industry Perspective: Making Sure Animal Sciences Graduates Are Ready for the World of Work *Karl Dawson, PhD, Alltech, Inc.*
10:05 am	Break
10:30 am	The Future of Online and Traditional Instruction *Ron Lewis, PhD, University of Nebraska*
11:00 am	Creation of a Well-Rounded Animal Sciences Graduate: Blending Science, Production and Communication *Amy Radunz, PhD, University of Wisconsin-River Falls*
11:30 am	Panel Discussion
12:15 pm	**Lunch** – Atrium Inn

SESSION 2: The Connection Between Teaching Quality and Student Learning (1:15 pm) – Elan Ballroom

Moderator: James Sartin, PhD, Editor-in-Chief, Journal of Animal Science

1:20 pm	What Makes a Quality Teacher? *Don Ely, PhD, University of Kentucky*
2:05 pm	Strategies for Improving Teaching and Learning *Jason Apple, PhD, University of Arkansas*
2:50 pm	Break
3:15 pm	Strengthening the Curriculum and Improving Student Outcomes through Better Teaching *Jodi Sterle, PhD, Iowa State University*
4:00 pm	Panel Discussion
6:30 pm	**Reception** – Chateau Winery Caskeroom, Vatroom, Pavilion

Poster Session: New and Innovative Ways of Engaging Students in Classroom and Laboratory Settings

TUESDAY, JUNE 2, 2015

7:30 am **Breakfast** – Elan Ballroom Foyer

SESSION 3: Improving Student Success Before and After Graduation – Elan Ballroom

Moderator: Mike Looper, PhD, University of Arkansas

8:35 am Academic Advising: Improving the Odds for Success
Ann Leed, University of Kentucky

9:15 am Retention: The First Year and Beyond
Linda Martin, PhD, The Ohio State University

10:00 am Break

10:30 am Do Extracurricular Activities Enhance Student Success?
Debra K. Aaron, PhD, University of Kentucky

11:00 am After Graduation: What Does Success Mean?
Todd Armstrong, PhD, Elanco

11:30 am Panel Discussion

12:00 pm **Lunch** – Atrium Inn

SESSION 4: Accreditation of Animal Science Programs – Elan Ballroom

Moderator: Greg Lardy, PhD, North Dakota State University

1:00 pm Departmental Tools for Curriculum Evaluation and Assessment
Henry Zerby, PhD, The Ohio State University

1:35 pm The Need for Accreditation: Benefits to Administration, Faculty and Students
Joe Sussman, PhD, ABET

2:15 pm Putting a Plan on the Table: Accreditation through ASAS
Margaret Benson, PhD, Washington State University

3:00 pm Panel Discussion

3:45 pm Conference Wrap Up and Take Home Message

Conference ends at 4:00 pm on Tuesday, June 2, 2015

DR. DEBRA K. AARON

Debra K. Aaron earned a BS degree in Agriculture and a MS degree in Animal Sciences from the University of Kentucky. After receiving her PhD in Animal Breeding from Oklahoma State University, she was hired as an Assistant Professor of Animal Sciences at the University of Kentucky in 1984. Today, she holds the rank of Professor in the Department of Animal and Food Sciences at UK.

Dr. Aaron has taught over 3,200 graduate students in statistics and over 1,200 undergraduates in Senior Seminar, Capstone for Animal Agriculture, Applications of Animal Science and Animal Genetics during her 30-year professional career. She has been curriculum advisor to undergraduates and is currently a faculty advisor to the UK Block and Bridle Club. Along with her teaching and advising responsibilities, she has been active in research, focusing on sheep breeding and genetics. She developed a nationally recognized White Dorper sheep flock at the University of Kentucky by grading up from Polypays.

She has been awarded the ASAS Southern Section Distinguished Service Award, the ASAS Fellow Award for Teaching and the ASAS Distinguished Teacher Award. In addition, she has been recognized as an Advanced Degree Graduate of Distinction by Oklahoma State University. She has served as Chair of the FDA Center for Veterinary Medicine's Advisory Board and as National Block and Bridle President. Currently, she is a member of the Production, Education and Research Council of the American Sheep Industry and is serving as President of ASAS.

DR. JASON K. APPLE

Jason Apple grew up on a small ranch in southwestern Oklahoma, where he was involved in raising beef cattle and market hogs. After receiving his B.S. degree in Animal Science from Oklahoma State University, Jason continued his education at Kansas State University, obtaining his M.S. and Ph.D. degrees in Animal Science, with emphasis in Meat Science, under the direction of Dr. Michael E. Dikeman. In 1995—after two years serving as a Lecturer in the Department of Veterinary and Animal Sciences at the University of Massachusetts (Amherst)—Dr. Apple accepted a position at the University of Arkansas Department of Animal Science as an Assistant Professor, and rose through the ranks of Association Professor and Professor. His research endeavors are concentrated on the factors affecting pork and beef quality, most recently focusing on the nutritional factors impacting pork fat and belly/bacon quality.

Jason has mentored 17 M.S. and Ph.D. students, and he has received in excess of $1.4 million in support of his research efforts. He and his colleagues have published 75 refereed articles, 139 scientific abstracts, and 5 book chapters to date. The American Society of Animal Science has recognized Jason's research accomplishments with the 2008 Meats Research Award, and he was recently elected President of the Midwest Section. Jason teaches approximately 200 students each year in one of three undergraduate courses he teaches. He and his wife Allison reside in Springdale, along with their children Hanna, Hadley, Zane, and their grandson Luke Henry.

DR. TODD ARMSTRONG

Todd Armstrong is the Senior Director of U.S. Beef Operations at Elanco Animal Health. In this capacity since January 2013, he is responsible for the U.S. Affiliate Beef Business.

Since joining Elanco in 2000, Todd has held a number of management positions within the company. His previous role was Sr. Director of Global Regulatory where he was responsible for Elanco's global regulatory strategy and operations.

Todd received his BA in Biology and French from Lipscomb University in Nashville, TN, a MS and PhD from North Carolina State University, a MS from Purdue University, and a MBA from the Kelley School of Business at Indiana University. Prior to his current responsibilities, Todd has held various other positions in Elanco across the commercial and R&D organizations.

Todd serves on the Board of Directors and Executive Committee of the American Society of Animal Science, is a member of the Board of Directors for FHL International, is actively involved in the EDGE mentoring program ofTruth@Work, and is a member of the Board of Directors for the Indiana 4H Foundation.

Todd currently resides in McCordsville, Indiana with his wife Angela and their four children.

DR. MARGARET E. BENSON

Dr. Margaret E. Benson, Professor and Chair, Washington State University has made significant contributions to animal agriculture through outstanding administrative leadership within ASAS and in her home institutions. She facilitates other's success by removing barriers, finding resources, and providing opportunities. As Chair of Animal Sciences at WSU, Dr. Benson's leadership and faculty and staff accomplishments have established a high bar for excellence and productivity which is recognized and valued. While President of ASAS (2010), a comprehensive strategic plan was implemented that significantly increased membership and innovative programming including ASAS's Grand Challenges 2012 and the Innovate conference series. Dr. Benson is dedicated to the livestock industries, committed to both fundamental and applied research and desires to produce career-ready graduates all of which help frame her administrative philosophy as she unselfishly creates opportunities for others to succeed.

DR. KARL A. DAWSON

Dr. Dawson is Vice President /Chief Scientific Officer of Research for Alltech Inc. directing activities four Biosciences centers around the world. He oversees administration and scientific programs in a research department of more than 140 employees. He also oversees the company's external contract research which includes programs for 50 graduate students around the world and activities in Alltech's 20 international research alliances. Serving on the Board of Directors for Alltech for 14 years providing technical innovation that has allowed the company to grow from slightly less than $100 million in sales to over $1 billion through service and products to the agricultural community.

Karl Dawson is an Adjunct Professor of Nutritional Microbiology and served as director of the Nutritional Microbiology laboratory in the Department of Animal Sciences at the University of Kentucky for 20 years. He has a B.S. degree in Bacteriology , Utah State University, an M.S. degree in Microbiology, University of Wyoming, and a Ph. D. in Bacteriology from Iowa State University.

In recent years, Dr. Dawson has also provided leadership for the nutrigenomics research initiatives that have led to strategic programs that use epigenetic switches to more effectively control nutrient utilization and improve animal health. These nutritional programming strategies are being tested as alternatives to antimicrobial growth promotants and are changing the face of nutritional science. These will change the way nutrition is used to improve animal production and the quality of animal products.

DR. DONALD G. ELY

Donald G. Ely is one of the premier sheep nutritionists in the United States but he is perhaps best known for his impact in the classroom. A native of Oklahoma, he received his BS and MS degrees at Oklahoma State University and his PhD in Ruminant Nutrition from the University of Kentucky in 1966. He returned to the University of Kentucky as a member of the animal sciences faculty in 1968.

Dr. Ely has contributed to the animal industry through teaching, extension and research. During his 47 years at UK, he has been heavily involved in undergraduate instruction. He has taught over 4,000 students in introductory animal sciences courses and sheep production and was recognized as the 2015 Outstanding Teacher in the UK College of Agriculture, Food and Environment. His annual EweProft, Lambing and Shearing Schools draw large numbers of producers from across the country. He has served as academic advisor to over 1,000 undergraduates and he has trained numerous graduate students, many of whom have gone on to brilliant careers. He has served as faculty advisor to the UK Block and Bridle Club for over 30 years.

In addition to being recognized as a great teacher by his peers and students, Dr. Ely has received numerous awards from ASAS. These include the Industry Service Award, the Fellow Award for Teaching and the Distinguished Teacher Award. He has also been awarded the ASAS Southern Section Distinguished Service Award. Dr. Ely is the coordinator for research, teaching and extension at the C. Oran Little Research Center's Sheep Unit. He is author or co-author of 75 refereed journal articles, 155 abstracts of papers presented at professional meetings, 4 book chapters, 25 extension bulletins and 20 conference proceedings.

ANN LEED

Ann Leed was raised on a small sheep operation in eastern Pennsylvania and was involved in 4-H and FFA. She received her bachelor's degree at Iowa State University in Animal Science and competed on both the Livestock and Meats Judging Team. At the University of California-Davis, Ann earned her M.S. in Animal Sciences, focusing on swine reproduction. From 2006 until 2011 Ann was an instructor and livestock judging coach at Mississippi State University.

Currently, Ann is the academic program coordinator for Animal Sciences at the University of Kentucky. In that role she advises over 225 students and serves as a liaison to the faculty advisors. Additionally she is responsible for prospective student visits and recruitment. Ann also teaches Swine Production, Issues in Agriculture, and Livestock, People and their Interactions.

DR. RON LEWIS

Ron Lewis is a Professor of Animal Breeding and Genomics at the University of Nebraska-Lincoln. Ron's research interests focus on two main themes: (i) defining pragmatic strategies to improve the reliability of genetic evaluation, and thereby enhancing selection response, in livestock species; and, (ii) understanding how animals, changed through artificial selection, are influenced by and interact with their environment. This work involves a mixture of theory, simulation and field studies, with close collaborations nationally, in Great Britain and in Norway.

Ron teaches an undergraduate course in Animal Breeding, and several graduate-level courses in quantitative genetics. He is the coordinator of a national graduate-level distance-delivered program in animal genetics and genomics (http://www.enbgeo.soe.vt.edu/index.php). He also has developed, and continues to support, an online simulation game (CyberSheep) that provides experiential learning in animal genetics in both undergraduate and graduate courses.

DR. LINDA MARTIN

Linda C. Martin, Associate Dean and Director of Academic Programs in the College of Food, Agricultural, and Environmental Sciences at The Ohio State University, earned her BS in Animal Science from The Ohio State University, and MS and PhD degrees in Animal Breeding and Genetics from Virginia Polytechnic Institute & State University and Colorado State University, respectively. Prior to her current position, Linda served as the Assistant Dean for Academic Programs in the College of Agricultural Sciences & Natural Resources at Oklahoma State University following 15 years of successful teaching and advising at Kansas State University.

During her career Linda has received of over 25 different college, regional and national awards for teaching excellence including the *North American Colleges and Teachers of Agriculture Distinguished Educator Award; American Society of Animal Science Distinguished Teacher Award; National USDA Excellence in College and University Teaching in Food and Agriculture Sciences Award;* and was the first woman inducted into *The Ohio State University Animal Science Hall of Fame*.

In 2011, Linda was named the Sanford G. Price and Isabelle P. Barbee Chair in Teaching, Learning and Advising in the College of Food, Agricultural, and Environmental Sciences at Ohio State. In 2014 she was appointed Director of The Ohio State University's Second-year Transformation Experience Program (STEP) with the Office of Academic Affairs. In this role, Linda provides leadership for the University's second-year mentoring program designed to engage students in high-impact practices designed to enhance personal, professional and academic success.

DR. BARBARA OAKLEY

Barbara Oakley, PhD, PE is a professor of engineering at Oakland University in Rochester, Michigan. Her work focuses on the complex relationship between neuroscience and social behavior. Dr. Oakley's research has been described as "revolutionary" in the Wall Street Journal—she has published in outlets as varied as the *Proceedings of the National Academy of Sciences*, the *Wall Street Journal*, and *The New York Times*. She has won numerous teaching awards and co-teaches Coursera – UC San Diego's "Learning How to Learn," one of the world's most popular massive open online courses, with well over half a million students to date. Her book *A Mind for Numbers: How to Excel at Math and Science (Even If You Flunked Algebra)*, (Penguin, 2014) is a *New York Times* best-selling science book.

Dr. Oakley has adventured widely through her lifetime. She rose from the ranks of Private to Captain in the U.S. Army, during which time she was recognized as a Distinguished Military Scholar. She also worked as a communications expert at the South Pole Station in Antarctica, and has served as a Russian translator on board Soviet trawlers on the Bering Sea. Dr. Oakley is an elected Fellow of the American Institute for Medical and Biological Engineering.

DR. AMY RADUNZ

Dr. Amy Radunz grew up on a farm in central MN and attended North Dakota State University where she majored in Animal Science. She also received her M.S. degree from NDSU. She has worked in the area of beef cattle production with positions in Extension, teaching and research at The Ohio State University, Washington State University and University of Wisconsin-Madison. During that time she also received her Ph.D. in ruminant nutrition and meat science from The Ohio State University.

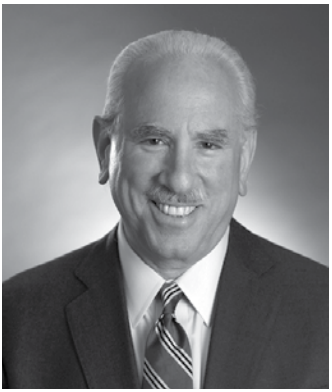
Amy is currently at the University of Wisconsin-River Falls Department of Animal and Food Science in a full-time teaching position where she is teaching Beef Cattle Production courses, Introduction to Animal Science, and Live Animal Carcass Evaluation.

DR. JODI STERLE

Dr. Jodi Sterle is the Harman Endowed Professor in Undergraduate Teaching and Learning in the Department of Animal Science at Iowa State University. She also serves as the undergraduate teaching coordinator for the almost 1100 students enrolled in the Animal Science. In this role, Sterle works with recruitment and retention of students, the curriculum and instruction, and placement of graduates. Sterle earned a B.S. in Animal Science from Michigan State University and a M.S. and Ph.D. in Swine Reproductive Management from the University of Missouri.

Upon completion of her doctorate, Jodi moved to Texas A&M University, where she served as the State Extension Swine Specialist as well as taught several classes. Sterle worked closely with several of the major livestock shows in Texas, designing educational programs and facilities focusing on improved handling and exhibitor quality assurance.

Dr. Sterle teaches courses in introductory animal science, issues facing animal science, and a unique course entitled "The Art and Heritage of Livestock". Jodi also advises several student organizations, and serves as an academic adviser for 80 students. This allows her contact with over 1,000 undergraduate students each year. She continues her extension appointment at Iowa State University, working with state and national pork producer associations, including the National Pork Board and the National Junior Swine Association. Dr. Sterle has judged several county and state swine shows. Jodi and her husband, Steve, have two sons, Jake and Jackson, who are involved in showing beef cattle, sheep and swine.



DR. JOE SUSSMAN

Dr. Joe Sussman is both Chief Accreditation Officer and Chief Information Officer for ABET, the recognized accreditor for college and university technical education programs in applied science, computing, engineering, and engineering technology worldwide. In this role since 2011, Dr. Sussman leads ABET's global accreditation operations, collaborating with the organization's volunteer leadership in both tactical execution and strategic development of ABET's accreditation practice.

Prior to joining ABET, Dr. Sussman spent 26 years as an engineering leader and senior business executive at Bayer AG, leading many of the company's quality, manufacturing, and IT efforts. After retiring from Bayer Joe became an Industry Specialist at Deloitte Consulting, where he worked with many prominent global clients.

In addition to his impressive industry background, and prior to joining ABET staff, Joe served ABET for 24 years in nearly every volunteer capacity, including:

- Program Evaluator for mechanical engineering programs,
- Chair of the Engineering Accreditation Commission,
- Representative Director from ASME on the ABET Board of Directors,
- ABET President for 2008-2009.

Dr. Sussman was inducted as an ABET Fellow in 2002 after having played a pivotal role in implementing the ground-breaking *Engineering Criteria 2000*. In 2011 the ASME Board of Governors elected Dr. Sussman an ASME Fellow for his contributions to quality in engineering education.

DR. HENRY ZERBY

Dr. Zerby is a Professor in the Department of Animal Sciences at The Ohio State University where he is currently serving as Department Chair. Dr. Zerby has served as the faculty coordinator of the undergraduate curriculum for the Animal Science major and minor, the Meat Science major and minor, the Animal Pre-veterinary Medicine minor, and the Human and Animal Interactions minor. He has also served as the faculty director of the Department of Animal Sciences Abattoir, the Meat Processing Laboratory, and the Intercollegiate Meat Evaluation Team. Dr. Zerby served as the lead or co-instructor in nine courses and also continues to serve as an advisor for both undergraduate and graduate students, and as a faculty advisor for the Animal Sciences Graduate Student Association and the Meat Science Club. In addition to developing a new Meat Science major in the College, he has also traveled with and collaborated in the development of several undergraduate study abroad programs.

Dr. Zerby is a past member of the College's Academic Affairs Committee and currently serves on the University Council of Academic Affairs and chaired that committee form 2013-2014. He has received numerous awards and honors for his dedication to teaching and outreach including Gamma Sigma Delta Teaching Award of Merit, Mid-West Section American Society of Animal Science Outstanding Teaching Award, Ohio State University CFAES Price Advising Award and Teaching Award, Ohio State University Rodney F. Plimpton Outstanding Teaching Award, Ohio Beef Council's Industry Service Award, and the National Lamb Feeders Association Industry Leadership Award.

DR. STEVEN ZINN

Dr. Steven Zinn joined the faculty in the Department of Animal Science at the University of Connecticut in 1990 and is currently a professor and head of the Department of Animal Science. He teaches an FYE class for freshman in Animal Science and an upper division Endocrinology class for Animal Science majors. He is the official academic advisor to over 70 students and the unofficial advisor to many more. Dr. Zinn has been recognized for his teaching and advising earning the University Outstanding Advisor Award in 2001, the FYE Teacher Award in 2002, and the College of Agriculture Excellence in Teaching Award in 2002. In addition, to his teaching and administrative duties, Dr. Zinn maintains a research program in Endocrinology and Growth Biology and is the author or co-author of over 70 peer-reviewed manuscripts, 2 book chapters, and over 100 abstracts. From 2008 to 2013, Dr. Zinn was Editor-in-Chief of the *Journal of Animal Science* and is a founding member and Editor-in-Chief of *Animal Frontiers*. He and his wife, Catherine, have two children; Jake is a senior at UConn and Anne is an MS student at Boston College. At home, they raise horses, sheep, dogs and cats.

P01 The use of experiential learning as a form of resident instruction for undergraduate students at the University of the Virgin Islands. *R. W. Godfrey*[*]*, University of the Virgin Islands, St Croix, US Virgin Islands*

The University of the Virgin Islands (UVI) Land Grant programs consist of the Agricultural Experiment Station (AES) and the Cooperative Extension Service (CES) with no teaching component for agriculture. The lack of academic programs in agriculture at UVI has led to the development of alternative methods to involve undergraduate students in animal science. Between 2001 and 2005 students were mentored in the AES animal science research program with financial support from the National Institute of Health Research Initiative for Scientific Enhancement grant awarded to the College of Science and Math. Beginning in 2005 AES obtained funds from the USDA-NIFA Resident Instruction Grants Program for Institutions of Higher Education in Insular Areas to mentor students in all disciplines within AES (agroforestry, animal science, aquaculture, biotechnology and horticulture). Students who had an interest in animal science were recruited primarily from the College of Science and Math and the majority were biology majors. The students worked directly with the animal science research faculty and staff who provided guidance and training. The students were paid for 20 hr/week and were required to conduct a research project of their own, that complemented ongoing funded efforts in the program, in addition to assisting with other program activities. If the student met the prerequisites they could enroll in BIO-495 Directed Independent Study and receive academic credit for their work. Regardless of the major, the students were taught the scientific method and were involved in experimental design, sample collection and analysis, data analysis and report writing. The students were provided with opportunities to present their research results at local, regional and national conferences. There have been 17 undergraduate and 1 graduate student mentored in animal science. Outputs consist of 2 peer-reviewed manuscripts, 15 abstracts submitted to regional or national conferences with students presenting 9 of these, and 8 additional presentations at UVI-sponsored symposia. Students have gone on to pursue bachelor and graduate degrees in biomedical and agriculture sciences at UVI and other institutions (10 B.S., 1 Ph.D., 2 M.D. and 1 D.V.M.). The use of experiential learning and a research faculty mentor has proven to be an effective method of providing students an opportunity to conduct research in animal science and agriculture at a small Land Grant institution that does not have an agriculture degree program.

P02 Contemporary Issues in Animal Agriculture: Integrating Polarized Perspectives to Challenge Graduate Student Opinions. *M. M. Beverly*, S. F. Kelley, K. W. Ferrell and C. Wellmann, Sam Houston State University, Huntsville, TX*

Increased political and public attention to agricultural policy and industry practices has created a need for graduates in the agricultural sciences to formulate and defend professional opinions regarding contemporary agricultural issues. In the graduate course, Contemporary Issues in Animal Agriculture at Sam Houston State University an innovated teaching approach was implemented to develop professional opinions and awareness of contemporary agriculture issues with graduate students. Historically, instructors have used classroom lectures and formal student debates to foster student awareness of contemporary agriculture issues and establish opinions. After personal exposure to various anti-conventional agricultural films, instructors decided to incorporate various polarized pieces of multi-media to facilitate graduate discussion as an alternative to standard lecture. Topics included animal rights, feed additives, workforce labor, consumer rights, food policy, etc. The students completed pre/post-free response surveys polling their beliefs on topics discussed during class after various media was introduced. Student responses were analyzed using NVivo™ software. After each section of the film, different open-ended questions were asked to the class to start classroom discussion and debate. When appropriate, the instructor and/or certain students were asked to play the opposing role to the general class consensus. This method would force the students to think outside of their traditional viewpoints and belief system and form educated responses. Preliminary qualitative analysis demonstrates that 65% of students reported a shift in personal beliefs after media introduction and course discussion centered on food labeling and consumer awareness. Conversely, students held to instructor hypotheses in many areas, most notably voicing no change in personal beliefs with respect to the perceived role of agricultural producers, and disparities of on-farm labor, after media exposer and discussion. Overall, instructors found polarized media exposure and classroom discussion on contemporary issues caused students to evaluate and defend professional opinions. The course finished with team debates over selective issues. When polled, students expressed that post questions would have shown greater changes if delivered after the team debates: after team debates an even more in-depth knowledge of the subjects were achieved causing initial opinions of the subjects to change. Faculty will continue to review delivery methods that will not only challenge intellectual thought but allow students to express their beliefs while also assessing their value system with contemporary agricultural issues.

P03 Teaching a course on international animal agriculture from a humanitarian perspective: Methods of delivery. *S. D. Lukefahr*, Texas A&M University-Kingsville, Kingsville, TX*

For nearly 30 years, the author has regularly taught a course on international animal agriculture (IAA). The impetus for teaching IAA was based on his early career experience working for Heifer International in Cameroon and his expertise in small-scale rabbit production. The IAA course objective is to create student awareness on the global role of livestock in benefitting humans, especially as a tool in poverty alleviation for people living in poor communities and(or) lesser developed countries (LDC). IAA has been offered as an elective course to both upper level and graduate students who meet together as a class. Several innovative teaching methods have been used. A course website was created that features ten learning modules involving three sections: global issues background, microlivestock, and project development. The website also provides links to articles and essay assignments, other resources, and links to humanitarian organization websites. In introducing each module, the author delivers either a PPT or a set of slides. Content is largely based on articles and reports reviewed, coupled with the author's experiences of working in about 30 LDCs. Short videos are regularly played that take students to an LDC, showing an appropriate species, practice or model. Students are assigned essays and take regular examinations throughout the semester in which appropriate technology issues are addressed. (Undergraduate and graduate students are usually given separate reading assignments and examinations.) In some years, graduate and honor's students are assigned a term paper in which a project plan (e.g., the student chooses three microlivestock species that are integrated into a low-cost farm model) is drafted with the aim of impacting a hypothetical limited-resource family. In class discussions there is good synergy between undergraduate and graduate students as new knowledge is shared. At the end of each class, students are assigned on-line articles to read from renowned agricultural experts. As students enter the classroom at the next class meeting, they present a "passport" (usually on 5X7 notecards: on one side students write on what was most important about the article(s) and on the other side what they found most interesting) and then are permitted to take a seat as in boarding a flight involving international travel. This exercise prepares students for meaningful engagement in class discussions. In conclusion, while several former students have pursued international careers, most students have simply benefitted from developing a broad awareness of the global role of animal agriculture in human development.

P04 Can undergraduate research programs impact graduation rates and grade point averages?. *D. L. VanOverbeke* and J. A. Hernandez Gifford, Oklahoma State University, Stillwater, OK*

The undergraduate research scholars (URS) program for Animal Science and Food Science majors was established over 10 years ago. This departmental program is unique in that it allows students to participate for all four years in undergraduate research. To date, the UR contains complete records relative to participation, graduation, and GPA on 60 students. In addition to those 60 students, an additional 21 participants are still involved in the program and are still working on B.S. degrees. During their average participation of 1.6 years, or 3 semesters, 15 of the 60 completed participants were selected to receive competitive University-wide research awards such as Niblack Scholarships or Wentz Scholarships. Of the 60 students who have completed the URS program, 9 are still current students in Animal or Food Science, but are no longer participating in the program. With 51 students remaining with completed records, 96.1% of those graduated with a B.S. degree from Oklahoma State University, the average GPA was a 3.60, and participants graduated in an average of 3.74 years. In comparison, considering all Animal Science and Food Science majors and averaging over the past five academic years (fall 2010 to fall 2014), students graduated with a GPA of 3.16, graduated in an average of 8.4 full-time semesters. Moreover, considering students who began degree programs in Animal Science from 2004-2010, average 4, 5 and 6 year graduation rates from OSU were 43.6%, 60.8%, and 63.2%. These data support that undergraduate research programs have a valuable impact on student success and completion of undergraduate degrees.

P05 The use of a class blog to maintain student involvement during an industry tour course. *N. Chapel*[*1] *and M. K. Neary*[2], [1]*Purdue University, West Lafayette, IN,* [2]*Purdue University, W. Lafayette, IN*

Every other spring Purdue University's Animal Sciences department offers an industry travel course to engage students with agricultural and animal related industries outside of Indiana. Though the majority of students enrolled are animal science majors, for some this is one of their only opportunities to visit a farm. The 2015 course involved visiting 14 locations across Kentucky, Georgia, South Carolina, North Carolina, Virginia, and Ohio. Traditionally, a formal presentation was given about the tour following the trip and was open to the public and department to attend, however this approach received very low attendance. For the 2015 semester, a class blog was introduced in place of the presentation to serve as a median for students to inform individuals outside of the course about their experiences, as well to help students remember details regarding stops after the trip and give students experience in writing about agriculture to an outside audience. Students were placed in groups of three or four and assigned to two stops relative to their species of interest. The class blog also served as a platform for students to get to know their classmates with a pre-trip biography. Producers at the scheduled stops were made aware of the blog and encouraged to look at student biographies prior to our arrival. This helped them better tailor their discussion with the students as they were made aware of the students' background. The blog was made available to faculty, parents, and animal sciences students, as well as being open to the public. After visiting each stop, student groups were asked to write up a page regarding the stop, including an overview of the stop, content learned, and information they found interesting or new to them. Groups were also asked to include a minimum of three photos per blog entry and were required to post the information before the first stop the next day, giving most groups anywhere from 16 - 24 hours to complete their assignment. One of our primary struggles throughout the trip was maintaining internet access. Wireless hotspots were set-up on our bus however access was variable with cell phone signal and struggled to maintain for all of our needs. The blog created for our trip will be used in the future as a means to advertise the course to prospective students and serve to increase course enrollment.

P06 Service-Learning Project: Student-designed Pasture Study to Increase Soil Carbon. *A. Safran*, University of Connecticut, Storrs, CT*

Service-learning is a teaching method with many proposed student benefits including improvement in critical thinking and problem solving in a "real world" situation, promotion of active learning experiences that improve learning and student communication skills, increased enthusiasm for course material and participation in other civic activities in the future. There are also expected benefits to the community partner with whom the students work, in this case the environment will be the "partner". During the fall of 2014, students in an undergraduate Sustainable Animal Management course collected baseline soil samples for measurement of soil carbon content. Then, students designed a sheep pasture management plan with the goal of increasing soil carbon content using rotationally grazed sheep and fertilization with compost. This method will be compared to a pasture using only rotationally grazed sheep. Soil samples will be collected each fall (2015 to 2025) and current students will assess any changes that have occurred, judging the efficacy of this method to increase soil carbon sequestration and make recommendations for the next year. Students will be asked to reflect on the importance of this study on their understanding of the effect of animal agriculture on global climate change.

P07 Seeing, Doing, Videoing: How to show there is more to nutrition than formulation and feces. *C. E. Vonderohe* and S. Radcliffe, Purdue University, West Lafayette, IN*

The demographics of Animal Science departments has changed rapidly in the last 20 years, with an ever-increasing proportion of students coming from non-farm backgrounds and interested in non-traditional species. While many of the same nutritional principles apply across species, it is often harder to engage students in learning when the species being discussed is not one of primary interest. One solution has been to try and cover a broader range of species in the classroom, but this reduces the depth of material that can be covered. Therefore, in the Applied Animal Nutrition course at Purdue University (ANSC32400), we flipped the classroom and challenged students, in small groups, to teach us something about nutrition, digestive physiology or feeding management in the form of a video. With funding from an instructional innovation grant, we were able to provide the students with film, video and editing equipment. Students were required to put together a proposal for their video, which had to be approved by the instructor. We left the topic area intentionally broad to allow students to actively engage in nutrition-based learning about an area and/or species that was of particular interest to them. Topics have ranged from gastrointestinal anatomy to nutritional management in species ranging from the mouse to beluga whales. All groups are required to obtain information from a qualified person, usually a Ph.D. nutritionist or a Veterinarian in addition to information in the literature. Projects usually require 20-40 hours of time spent out of the classroom throughout the semester, and are evaluated by a panel of faculty and graduate students. In addition, group members evaluate and grade each other. A secondary goal of these projects has been to develop videos that can be used in future teaching, extension and/or outreach efforts. To that end, students are required to identify an audience and a targeted online publication site prior to starting their project. We are now in our 5th year of these projects and are expanding deliverables beyond videos. The net result has been that these projects have served as a great tool to engage students in active learning, and have resulted in the production of videos that have use far beyond the course in which they are created.

P08 Teaching Companion Animal Nutrition and Care in the Classroom Concurrently with an Online Section of the Course. *M. D. Stern*, University of Minnesota, St. Paul, MN*

A course entitled "Companion Animal Nutrition and Care" has been taught for fifteen years at the University of Minnesota. Emphasis of the course is on nutrition of healthy animals and various factors that impact feeding an animal adequately including behavior, environmental conditions, food type and availability. Course goals are to develop or enhance student's appreciation of companion animals and their role and importance in our society, become knowledgeable of the basic nutritional requirements of companion animals and to understand basic management skills required for proper care of companion animals. Topics include the petfood industry, petfood regulations and labeling, principles of nutrition, health and environmental management of parasites, nutrition and care of dogs, cats, small mammals, reptiles, amphibians, companion birds and fish, and miscellaneous pets. Three years ago, a section of the course that is taught entirely online was introduced with the "in-class" section taught concurrently. Course schedule and homework assignments are similar between sections. Animal Science majors are required to take the course in the classroom while non-Animal Science majors have the option to take either section. Lectures are presented as a video in Powerpoint format with audio, however guest lecturers are recorded live and posted to the course Moodle website. In order for online students to feel part of a learning community, there is a weekly discussion forum addressing various topics. Discussion forums are intended to provide online students an opportunity to interact. An interactive method used with the "in-class" section is Pet Visits that take place at the beginning of each class. Students bring their own pet to class to discuss nutrition, care and behavior of their animal. Students ask questions which routinely leads to an excellent discussion. Videos of Pet Visits are posted online with students encouraged to watch them. After introducing the online section, there was concern whether this section would be as well received as the in-class section. Registration numbers for the in-class and online sections were 104 and 90; 73 and 115; 80 and 89, for 2013, 2014 and 2015, respectively. One of the student evaluation questions on a scale of 1 to 6 with 6 being the greatest, is whether the instructor presented subject matter clearly. Results for the in-class and online sections were 5.7 and 5.6; 5.6 and 5.5 for 2013 and 2014, respectively (with a median of 6.0 for both sections) indicating that the online section has been successful.

P09 Using a lean hog futures trading game and market simulator to enhance student learning. *B. D. Whitaker*, University of Findlay, Findlay, OH*

Undergraduate animal science students often have little knowledge or understanding of commodity markets and often struggle with the concepts and use of futures markets. To introduce swine production and management students to these concepts and principles, a futures trading game was implemented during a class session that included a "real-time" market simulator. This game replaced a traditional lecture and allowed students to interact, strategize, negotiate and observe how a market works. The game was designed to allow students to be producers or industry consumers looking to buy, sell, or hold contracts over four rounds of play. Each round included spot pricing, futures trading, and price expectation and verification. Students (n = 62) were evaluated through pre- and post-game assessments to determine if the activity increased their understanding of swine markets, based on a scale where 1 = disagree and 10 = agree. Criteria for increasing knowledge was a positive change in individual assessment score, successfully applying knowledge was defined as 90% of the students receiving a grade of > 80% on the marketing section of the exam, and a successful educational experience was defined as the students rating the experience > 7. All students significantly increased ($P < 0.05$) their knowledge of hog markets, based on their before (3.63) and after (7.12) self-assessment scores. Students' application of knowledge was significantly greater ($P < 0.05$) when participating in the futures game ($90.15 \pm 4.86\%$) compared to those that did not ($84.16 \pm 3.50\%$). Students enjoyed the method of learning (9.00) and believed it increased their comprehension of the material (8.83). Students believe that the course objectives were met (8.00) and that the lean hog futures trading game was an appropriate learning strategy to use in a swine production course (8.73) because it provided opportunities for practical experiences (8.39), which are continuously requested by students (9.83). Despite these positive results, students rated the industry and market realism of the game only average (6.09) and modifications to the game will continue to be made as the game continues to be used in classes in order to cultivate students' interest in swine production.

P10 Curricular Undergraduate Research as a High-Impact Practice for Animal Science Majors. *K. L. DeAtley*, S. P. Doyle and K. A. Moore, California State University, Chico, Chico, CA*

Undergraduate research has been identified as one of the 10 high-impact educational practices for undergraduate students. Curriculum at California State University, Chico requires animal science majors to complete an agricultural experimentation course as part of their upper division course work. Objectives of the course are to provide an introduction to critical thinking and statistical methods for conducting applied agricultural research. Emphasis throughout the course is placed on principles of design and inference, rather than the mechanics of statistical computations. This course is designed for students to develop and design an original agricultural research project. Curriculum is delivered in an interactive, three-module process: lecture, discussion activity, and individual research project. The lecture portion focuses on review and exploration of the scientific method, variation, principles of experimental design, analysis of variance and research ethics. The discussion activity, held weekly, is designed for students to conduct scenario-based activities that practice lessons presented in lecture. During the course of the semester, students also help design and execute an individual research project. Students have the choice of doing their own individual project with the supervision of a faculty member or participating in one of two class-specific projects. Regardless of the choice, students play an instrumental, if not lead, role in project design, execution, data collection, analysis, and presentation. Presentation of the research is completed in a three-step process, where students complete a research paper in sections: 1) introduction and materials and methods, 2) results and discussion, 3) revision of previously completed sections plus abstract, conclusion and literature cited. Assessment of this current model revealed that students had a better understanding of the scientific method and were better able to critically think through research scenarios after taking this required course. Uniquely, this method exposes a larger percentage of students to principles of experimental design and the research process than in traditional models. Specifically in this model, all animal science majors gain research understanding and applied experience; where as in other models, this type of experience may only be achieved by a handful of students that work in a co-curricular setting (i.e., faculty member's laboratory, research program, graduate student research).

P11 Human-Animal Interactions in Real World Settings. *K. A. George* and S. J. Moeller, The Ohio State University, Columbus, OH*

The turn of the 21st century introduced a new type of student to the Animal Sciences curriculum. The majority of these students does not have a background in agricultural production and are more focused on the human-animal relationship in general. In addition, these students expect more out of their educational experience than learning in a traditional lecture hall. This, along with growing faculty research interests in the human-animal relationship, led to the development of the *Human-Animal Interactions (HAI)* courses at The Ohio State University. The courses were offered for the first time in 2008 and consist of domestic and study abroad learning experiences. The learning objectives for these courses are to: create awareness of the role that animals have in our daily lives; explore the use of and attitudes toward animals in our communities; expand knowledge of and gain an appreciation for animals; expand knowledge of and gain an appreciation for other cultures; study the impact of animals on different aspects of our society as well as others around the world; gain an appreciation for how history, government, geography, and infrastructure can impact cultural development of our societies and the use of animals within our societies; and allow students to become more engaged in a learning experience outside the traditional classroom. Through field experiences, the domestic and study abroad HAI courses offer students an opportunity to experience and witness human and animal interactions in real world settings.

The novelty of the courses and the growing student enrollment necessitated an assessment of the courses' learning objectives and the overall impact on students' attitudes, values, and behaviors toward animals. Course impact was measured through a retrospective survey conducted in early 2014. Surveys were mailed to all students that had participated in the domestic HAI course (in later years the study abroad course became an option), as well as an equal number of non-HAI participant students majoring in Animal Sciences. The results indicate that HAI participants, when compared with the non-participants, have reduced utilitarian values toward all animal species, an overall increase in the degree of acceptance of differing social value(s) placed on animal species, and an increased awareness of cultural differences in regard to human-animal interactions.

Success of the HAI courses has led to the development of additional HAI-related courses, a new Human and Animal Interactions academic minor for non-Animal Sciences majors, and an increased emphasis on experiential learning opportunities.

P12 Incorporating writing-to-learn strategies into an animal reproduction course. *J. E. Larson*, Mississippi State University, Mississippi State, MS*

The objectives of this project were to determine whether incorporating writing-to-learn strategies into an animal reproduction course affected student performance as measured by assessment scores or final course grade and to determine whether performance on writing-to-learn activities was correlated with final course grades. Two semesters of physiology of reproduction were taught without (CON; Spring 2013 and Fall 2013; n = 67) and two semesters were taught with writing-to-learn strategies (WTL; Spring 2014 and Fall 2014; n = 64) which included formal drafts and editing before final submission of a scientific paper and daily short writing assignments related to content of the course. Data were analyzed using the GLM procedure of SAS; LSMeans and standard errors are presented. Significance was declared when $P \leq 0.05$. Mean scores for papers, exams and quizzes were similar ($P > 0.05$) for WTL students (36.7, 72.1 and 10.8 points, respectively) and CON students (36.6, 71.8 and 10.7 points, respectively). Enrollment in a CON or WTL course did not affect ($P > 0.298$) the final percentage or grade in the course. Of students enrolled in a WTL course, those with an above average mean score on the daily writing assignments achieved a higher ($P < 0.0001$) percentage (83.3%) and final grade (3.9 [A=5 to F=1]) compared to those with a below average mean score (68.5% and 2.5 for final percentage and grade, respectively). In conclusion, student performance did not differ between students enrolled in a course with writing-to-learn strategies compared to those that did not; however, students who performed above average on daily writing assignments had improved final grades in the course compared to those who performed below average. Therefore, students who did well on writing-to-learn strategies also did better on overall course performance.

P13 Use of high and low technology to enhance student responses in Introductory Food Science class. *D. L. VanOverbeke* and R. Ramanathan, Oklahoma State University, Stillwater, OK*

Student engagement is a critical component in learning process and student success. Learning outcomes include developing new knowledge, comprehension, application, analysis, synthesis, and evaluation. These outcomes will be achieved if there is a two-way interaction between the student and the instructor. Hence, student responses are critical for achieving expected learning outcomes such as critical thinking and/or mastery of knowledge in the relevant subject. Student response refers to any questions in a student's mind regarding the topic covered or related questions about a concept in class. Although there are several reasons for fewer responses in a class such as nervousness/shyness, lack of clarity, or lack of student engagement; use of alternate technologies will help overcome such hurdles. Even though it is known that student responses are critical for student success, limited research has determined the use of various techniques to enhance student response. The objective of the study was to determine the effectiveness of using high and low technology to enhance student responses in an introductory food science class. Three techniques were used to collect responses in class: (1) traditional method (control), (2) use of low, and (3) high technology. Data were collected during Spring and Fall semesters of 2014 from the students in Fundamentals of Food Science (180 students) class. Traditional method means the student response following completion of each topic/concept. For example "any questions regarding the topic covered today". Use of low technology means the students wrote down the responses on a paper. High technology include a web-based interactive tool TopHat® to post question(s) in the discussion option. The student responses were recorded every week. The data were analyzed using the Mixed Procedure of SAS and were considered significant at $P<0.05$. The results suggest that the use of either low or high technology has the potential to enhance student responses (low technology > high-technology > traditional method; 58%> 12%> 4%). Combination of various techniques in a class room setting will greatly enhance student engagement and participation.

P14 Does Performing Scientific Research Improve the Understanding of Science of First-year Undergraduate Students?. *M. D. Drew* and S. Sangster, University of Saskatchewan, Saskatoon, SK, Canada*

First-year students rarely have the opportunity to engage in research activities and develop the skills required for scientific research. To remedy this, the College of Agriculture and Bioresources at the University of Saskatchewan initiated a program to provide every first-term undergraduate student in the college with a research experience. The cost of doing actual biological research is prohibitive for this number of students so to overcome this limitation, the research projects consisted of surveys that used the students in each class as the sample populations. Students worked in groups of five, choosing a suitable topic, performing a literature search on the topic, and writing an introduction ending with a testable hypothesis. Groups developed two to three survey questions to test their hypotheses and the entire class participated in the survey to generate the data. The data was analyzed and presented in figures, tables and text. Students then wrote discussions to compare the results of their surveys with the published literature to determine whether they aligned and what the implications of their results were. Finally, groups created scientific posters and participated in a College-wide poster session attended by faculty, graduate students and research staff. To evaluate the potential impact of the research experience, surveys were conducted with the undergraduate students, instructors (N = 10), and research coaches (N = 14). For the purpose of this poster, data from one pilot course (Animal Science, N = 81) will be presented. Overall the students reported that they believed they gained an understanding of what research is and how it works (M = 3.89, SD = .82, scale range = 1.0 - 5.0) and that that their research skills (M = 3.65, SD = 1.05) and academic skills (M = 3.67, SD = 1.11) improved as a result of the experience. Instructors were even more confident that the undergraduate students gained an increased understanding of the research process as a result of the initiative (M = 4.40, SD = .52) and that their research skills improved (M = 4.60, SD = .52). Research coaches agreed that the students gained an understanding of the research process (M = 3.67, SD = .98). In conclusion, the preliminary evaluation of this pilot project suggests that research experiences may be beneficial for first-year students.

P15 Using Technology to Engage Students in Learning: CyberSheep.

R. M. Lewis, University of Nebraska-Lincoln, Lincoln, NE*

Experiential learning is a teaching strategy that requires the active engagement of students. It encourages the synthesis of factual information to address complex problems, which in turn helps develop the learner's expertise related to the given concepts. Such activities lead to deeper learning and improved skills in the application of knowledge. As a form of experiential learning, technology-mediated simulations provide an authentic context in which learners can apply discipline-specific concepts to solve real-world problems. In quantitative genetics, simulation programs have been used for decades to facilitate instruction. Software has been updated to incorporate new genetic technologies. In a few cases, web interfaces have been built. Integration with economic aspects of farming enterprises is rarer. CyberSheep is a web-based, genetic simulation game designed to provide students experience applying principles in quantitative genetics to a virtual sheep breeding cooperative. It considers both genetic and economic principles. Two polygenic traits and a recessive lethal condition are modeled. CyberSheep originated at Virginia Tech; it is now offered through University of Nebraska-Lincoln on a purpose-built web interface. Undergraduates and graduate at 29 Universities have played CyberSheep, in many cases simultaneously. Students play in teams, working collaboratively to engage in activities and decisions farmers face in practice. Reflection is an inherent part of the game since the outcomes of breeding decisions drive the teams' genetic progress, and that of the overall cooperative. From formative evaluations, students' perceptions of this instructional approach are overwhelmingly positive. For instance, in fall 2014, 211 undergraduates from four universities played Cybersheep. Ninety-four (45%) completed an anonymous online survey. When asked if their play of CyberSheep supported their learning of quantitative genetics, 97% responded "Yes" (77%) or "Somewhat" (20%). Written feedback included: "this is my favorite project I have done in my college career"; "my team was awesome, so it was fun meeting a couple times a week and working on it"; and, "the aspect I enjoyed the most was being able to take risk through different management decisions and not having to suffer terrible consequences that could happen in real life." CyberSheep has evolved into a unique, technology-enriched learning tool with the flexibility to fit graduate and undergraduate courses alike, and to reach students that are geographically dispersed. It facilitates experiential learning, emphasizing the notion that it is more effective for students to experience the practical effects of different behaviors and strategies in a learning situation than to passively observe them.

P16 Microvets: An interactive video game to enhance student understanding of digestive tract anatomy and physiology. *W. J. Silvia*, M. G. Rossano and B. Hains, University of Kentucky, Lexington, KY*

In 2010, investigators from Purdue University and the University of Kentucky (Knobloch, N. A. [PI], Hains, B. J. [Co-PI], Balschweid, M. A., Silvia, WJ., Rossano, M. Liceaga, A., Ballard, K., Orvis, K., Snyder, L., & Zanis, M.) were awarded a USDA Higher Education Challenge Grant (2010-38411-21634) entitled *Enhancing Science Capacity in Introductory Animal, Plant, and Food Science Courses*. The investigators from the University of Kentucky were responsible for developing materials to 'enhance the science capacity' of students in the introductory animal science course. We identified the differences between monogastric and ruminant animals in how specific nutrients are digested as the difficult concept to be addressed. This is a section of the course that students consistently scored poorly on in exams. Dr. Hains suggested that we develop a video game as the support platform. He identified and served as the liaison with the video game development firm. Drs. Rossano and Silvia provided the expertise on the subject matter. All three contributed in the development of the premise of the game and appearance of the visuals. The game is called Microvets. It is a single-player, action game. The student is presented with a horse who will not eat. The student must diagnose the cause(s) of the problem and rectify it. This is accomplished by boarding a special vehicle, shrinking down to 'edible' size and then exploring the digestive tract by entering at the mouth and leaving through the anus. Throughout the 'voyage', the student is in contact with a robot advisor who provides information, suggestions and thought provoking/directing questions. The game relies heavily on a cognitive learning perspective. Students are expected to learn material presented either directly or indirectly to them by the robot. The game also utilizes a constructive learning perspective. For example, students learn about the general shape of the digestive tract, the consistency of material being digested, the structure of microbes, etc. by observing the visuals. The first working version of the game was made available to students in the introductory animal science course at the University of Kentucky. Of the 268 students taking the class, 179 attempted to play the game and 86 completed it. Effectiveness as an instructional tool was evaluated by administering a test immediately before and after the student played the game. Average post game scores were higher than pregame scores ($P<0.05$).

P17 Teaching a Course on Companion Animal Ethical Issues Using Classroom Debates as an Interactive Learning Tool. *M. D. Stern*, University of Minnesota, St. Paul, MN*

An article in Education World noted that "using debates in the classroom can help students grasp essential critical thinking and presentation skills which included abstract thinking, citizenship and etiquette, clarity, organization, persuasion, public speaking, research, and teamwork and cooperation". Wiseman (2010) introduced a debate format into an undergraduate Anthropology course at the University of Illinois and found that "classroom debates altered the course from its initial, unremarkable run as a lecture series into a stimulating learning experience for all concerned". There has been a major shift during the past 10 years in demographics of Animal Science students at Universities throughout the country. A large proportion of Animal Science students are non-farm, urban students with an interest in companion animals and equine. Zawistowski (2008) stated that there are various circumstances where people differ in their opinions of how companion animals should be treated, type of care they should receive, and what type of animal can or should be kept as companions. He presented several examples of "hot button" issues that are debated among people, in the media, in the courts at both the federal level and in local communities. A new course was introduced in 2012 entitled "Companion Animal Hot Button Issues" that uses a debate format to stimulate interactive learning. This course has been taught for three years and has received excellent reviews from students. The most effective debate format and evaluations to use in this course were derived from teachers with debate experience. Using a randomizing tool, students are divided into debate teams and assigned a pro or con stance. Debate teams consist of two or three members based on class size. Teams are responsible for presenting their arguments based not only on opinion but supporting data and literature. After introductory statements, rebuttals and closing arguments by each team, non-debaters have the opportunity to ask questions for 20 minutes. Non-debaters vote on a winner of the debate using an immediate response system (Top Hat) using cell phones, smartphones, tablets, iPods or laptops. At the end of the debate, non-debaters complete an evaluation of each team for which they are graded. Debate presentations are video recorded and posted onto the course Moodle site for students to view. Each debate team submits a written statement supporting their stance and is graded. Main objectives of this course are to enhance oral and written communication skills, and stimulate critical thinking.

P18 Integrating Service in Introductory Animal Science Courses to Enhance Learning and Persistence. *K. Wood-Turner*[*1], *Q. S. Baptiste*[2] *and M. Knights*[1], [1]*West Virginia University, Morgantown, WV,* [2]*Berea College, Berea, KY*

It's widely acknowledged that student retention and persistence is positively correlated with the degree to which the students are engaged in the university and surrounding community. Students in the early stages of their education who become familiar with career options and the Impact of their selected area of study on society also remain more committed to their major. We developed a functional model to integrate service learning into an introductory animal science course which requires students to conduct 10 hours of service in order to foster community engagement and a better understanding of the role of the Animal Science discipline in society. Central to the service learning model is the Centre for Service and Learning (CSL), which developed the parameters for student service and established a community partner program consisting of a network of community organizations. The CSL trains and approves prospective partners to ensure learning outcomes are achieved and through an integrated database, links community partners, students and faculty, to facilitate announcement and selection of service opportunities and recording and verification of completed service hours. The integration of service and community engagement into the curriculum is achieved through the instructor relating components of the curriculum and impacts on society, pre and post service reflections conducted by specialist from the CSL and, in service-training conducted by the community partner. Over the last 4 years more than 99 % of students completed part or all of the required service hours. Collectively, students provided 3575 service hours in 885 unique attempts with 92 different partners. Students provided service learning hours primarily in animal welfare, youth in agriculture, human need and human health organizations (37.6, 11.4, 10.2 and 9% of the total service hours, respectively). Sixty percent (60%) of the total hours was spent pursuing service opportunities at non-animal related organizations indicating that students have an interest in, and are willing to become engaged a wide array of community related activities. Studies on the impact of early introduction to service opportunities on retention, persistence in initial major, subsequent service engagement and student performance are ongoing.

P19 Incorporating Case Studies to Enhance Critical Thinking Skills in Lower Division Animal Science Courses. *K. A. Moore*, K. L. DeAtley, C. R. Phillips and S. P. Doyle, California State University, Chico, Chico, CA*

Critical thinking skills have been identified by employers, as a key trait of agriculture graduates. Agriculture is a field that lends itself to teaching with case studies that can challenge the student to analyze a scenario, gather the necessary information to propose a solution, as well as communicate the solution. Furthermore, introducing higher-ordered thinking in lower-division courses can develop students that can operate in higher-order thinking during the later stages of their education. This presentation introduced case studies in a lower-division level Animal Feeds and Nutrition course at California State University, Chico. Our objective was to explore the impact of utilizing case studies on student comprehension of animal feeding concepts. The Animal Feeds and Nutrition course at Chico State is a hybrid course with an online lecture component and an in-class activity. The course was structured such that the first half of the semester covered key concepts in feeding (digestive systems, feed classes, basic formulations) and the latter half of the semester focused on species-specific feeding scenarios. Cases for the second half of the semester were designed to reflect "real world" feeding scenarios for companion animals (canine and feline), swine, equine, large ruminants and small ruminants. Each case required the students to either evaluate or formulate a ration for the scenario and to provide a written justification (complete with references) of their proposed solution. Each species group had an initial case and a final case. Initial observations (case studies) that did not have a corresponding final observation were excluded from the data set. The table below shows the descriptive statistics (by semester) for all initial cases and all final cases. Numerically, average scores improved from the initial case to the final case. Future research is planned to apply an edited version of Bloom's Taxonomy developed by Lorin Anderson (i.e. remembering, understanding, applying, analyzing, evaluating, creating) to quantify the levels of intellectual development in the case studies.

Assignment	Enrollment	n	Mean ± SD (percentage grade)	Min.	Max.
Initial Case (Spring 2014)	94	219	71.82 ± 21.31	20	100
Final Case (Spring 2014)	94	219	85.36 ± 12.52	30	100
Initial Case (Fall 2014)	50	108	75.23 ± 18.53	12.5	100
Final Case (Fall 2014)	50	108	81.63 ± 11.35	60	100

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