

COWPOKE NEWS

The Department of Animal Science, Oklahoma State University



IN THIS EDITION:

- Faculty Spotlight: Bob Wettemann
- Animal and Food Science Research
- Research Awards and Recognition



ANIMAL SCIENCE COWPOKE NEWS

Cowpoke News is published each semester by the Department of Animal Science within the College of Agriculture Sciences and Natural Resources at Oklahoma State University. We strive to keep students, alumni, and friends of the department informed about activities and success in our department.

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News From the Assistant Department Head

Dear Alumni and Friends,

We are pleased to present you with our second annual Research Edition of the Cowpoke News. Our department has a strong and proud history of excellence in research, and we are striving to become even better in the future. Projections are that by 2050, there will be 2.5 billion more people in the world than exist today. As the world population increases, food security on a global scale must become a greater priority. Population growth, economic growth and the rise of the middle class in developing countries are expected to further increase demand for meat, milk and eggs. This challenge demands considerable innovation and advancement in animal science, and technology development and adoption to increase efficiency and output of livestock production systems in a socially, environmentally and economically sustainable manner.

In the Department of Animal Science at Oklahoma State University, we are striving to do our part to meet this demand through both cutting edge and translational research and the training of the next generation of scientists. In this edition, you will read about the research being conducted by **Drs. Craig Gifford and Jennifer Hernandez-Gifford** in collaboration with the Kiamichi Link Ranch and scientists at other institutions to enhance pregnancy rates in cows by using maternal immune cells to allow intrauterine growth of the embryo. In addition, **Dr. David Lalman** and his graduate students discuss approaches to intensifying beef production through limit-feeding cows high-energy diets during strategic times to allow for the optimal regrowth and sustainability of beef cattle numbers. Their research will also increase our understanding of nutrient requirements for both beef cows and calves.

Our own **Dr. Sara Place** was invited by the National Academies to serve on the "Committee on Considerations for the Future of Animal Science Research" to identify the critical areas of research and development, technologies, and resources needed for animal science research in the U.S. and throughout the world. Her article summarizes the findings of this committee. We are extremely proud of Sara for her service and contribution to this committee. Way to represent!

As noted in this edition, our faculty are mentoring students to be the academia/industry leaders of tomorrow. These students will be at the peak of their professional careers in 2050, and will be responsible for helping to fulfill the increased food demand. The **Animal Science 4-H Stem Institute** is one example of our commitment to enhancing diversity and to recruiting the next generation of scientists. In addition, the **Animal Science Undergraduate Research Scholars Program** is designed to foster interest in science-based careers and graduate school. We are proud to introduce you to our undergraduate research scholars in this edition. We also celebrate the research awards and recognition of our undergraduate and graduate students and faculty.

Finally, and most significantly, we spotlight the career of **Dr. Bob Wettemann**. Dr. Wettemann served this department for over 42 years and exemplifies excellence in research, teaching and service. The impact Bob has had on animal agriculture is far reaching, resulting from his research, the success of the students he has trained, as well as his leadership to professional societies. We are grateful to Bob for his service to this department and for the example he continues to set for all of us to follow as we strive to achieve excellence in our respective disciplines.

In closing, Dr. Rusk and I are proud to say that our research faculty and their students have had a very successful year, and we are proud to present this Research Edition of Cowpoke News. Please pay close attention to our list of publications, and if a copy of a manuscript is of interest to you please let us know. We also invite you to attend the **Dr. Kenneth and Caroline McDonald Eng Foundation Symposium** on Sept. 17th and 18th, 2015 at the Skirvin Hilton Hotel in Oklahoma City, OK. This symposium will highlight the latest research on beef cow efficiency and profitability in intensive and semi-confined production systems. Finally, we say THANK YOU to the donors and major sponsors who have partnered with us to help us sustain our research mission.

Sincerely,
Dr. Clint Krehbiel

On The Cover

Dr. Bob Wettemann is on the cover of this issue. He was selected as the Faculty Spotlight for this year’s research edition to highlight his numerous career contributions to animal science. Read more about Dr. Wettemann on page 4.

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Faculty Spotlight

Written by Dr. Gerald Horn and Rebekah Alford

Dr. Bob Wettemann retired August 8th, 2014 after forty-two years of distinguished service to the Department, the Division of Agricultural Sciences and Natural Resources, OSU and its many stakeholders. Dr. Wettemann provided excellent leadership to the Department as Coordinator of the Research Program for twenty-eight years. He is passionate about the importance of designing and conducting quality, problem-solving research that addressed basic scientific and applied questions. Dr. Wettemann's research focused on the effects of nutrition on reproductive performance of beef cattle, pubertal development, estrous behavior, control of gonadotropin secretion, fetal programming and postnatal growth of calves and carcass value, and elucidation of biomarkers relative to maintenance

energy requirements of cows. He also conducted research with swine, dairy cattle, and sheep. He has presented invited lectures of his research at conferences and symposia in twenty-five states and twelve countries. Bob has received numerous awards, including the American Society of Animal Science (ASAS) Physiology and Endocrinology Award, the ASAS Animal Management Award, and ASAS Fellow Award, which recognizes distinguished service to animal science and the livestock industry over a long period of time.

Having grown up on a dairy farm in Connecticut, Dr. Wettemann's original goal in life was to have his own dairy farm. He washed dishes in Dr. Bill Pickett's lab while he was pursuing a B.S. in dairy science at the University of Connecticut. It was during those four

years that he became interested in research which eventually led him to attend graduate school. It was at Michigan State University, where he earned his M.S. and Ph.D., that he found his love for research.

Dr. Wettemann is also passionate about mentoring graduate students. He constantly inspired them to be critical thinkers, excited by scientific discovery, good communicators, professionals at all times, and life-long learners. He served as major advisor for twenty-four M.S. students, eighteen Ph.D. students and mentored four postdoctoral associates. Many of these students have become productive scientists and leaders in their fields. Twenty of his students have been on research and teaching faculties at major universities or agencies. Three are Department Heads and one is Associate



Director of an Agricultural Experiment Station. Fifteen other students have productive careers related to animal agriculture. Bob considers that one of his major contributions to the livestock industry has been through his work in mentoring graduate students.

When the word “retired” is used, it often evokes the image of long vacations, fishing and relaxation. Yet, Dr. Wettemann is still a familiar face in the Department and can often be found in his office working. One might take a look at Bob typing on his computer or reading a research paper and wonder if someone forgot to tell him he’s retired. The truth is he has lived his life doing what he loves and he is set on continuing his work. There is always more research and mentoring to be done, and Bob is going to be a part of it.

Believing in the importance of giving back to one’s profession, Dr. Wettemann has provided excellent leadership to the American Society of Animal Science (ASAS) for many years. He served as President of both the Southern Section of the ASAS and the National ASAS. In addition, he provided valuable leadership to the Federation of Animal Science Societies by his service on the Board, and the Executive and Strategic Planning Committees. He is presently serving as president of the American Registry of Professional Animal Scientists. Through his tenure at OSU and his service to the ASAS, Dr. Wettemann has achieved national and international recognition that has very positively impacted the Department, Oklahoma State University, and animal agriculture. At the recent annual meeting of the ASAS (July 2015) the formation of the Robert Wettemann Appreciation Club to recognize Bob’s contributions to education and the ASAS was announced. The fund will be used to provide support to graduate education and scientific discovery.

We express our thanks to Bob for his leadership and unwavering commitment to the good of the Department over these many years. We’re pleased that he still has not stepped out of the harness and continues to answer the bell. We wish him and Grace the very best in retirement, and know that they will stay very busy with travel, their three grown children and five grandchildren, Bob’s cows, and his hunting and fishing excursions.



Membership in Professional Societies:

- American Society of Animal Science
- American Dairy Science Association
- Society for Reproduction and Fertility
- Society for the Study of Reproduction
- The Endocrine Society American Registry of Professional Animal Scientists
- American College of Animal Physiology - Charter Diplomate
- National Cattlemen’s Beef Association

Honor Societies and Awards:

- Sigma Xi, 1971
- Richard M. Hoyt Graduate Student Award by Amer. Dairy Sci. Assoc., 1971
- Individual NIH Predoctoral Fellowship (Michigan State Univ.), 1968-1972
- MASUA Lecturer, 1976
- Department of Animal Science Tyler Award, 1979
- Visiting Professor, University of Florida, 1980-1981
- The James A. Whatley Award of Merit - Division of Agriculture, 1982
- Regents Professor, 1985-2014
- Sigma Xi Lecturer, Oklahoma State Univ., 1992
- Phi Kappa Phi, 1992
- Elmo Baumann Distinguished Professorship, 1996
- Celebrate State Award, Oklahoma State University, 1999
- Distinguished Service Award, Southern Sec. American Society of Animal Science, 2001
- King Foundation Visiting Scholar, University of Arkansas, 2005
- Elected a trustee of the American Society of Animal Science Foundation, 2004-2007
- Elected a Director of the American Society of Animal Science, 2005-2008
- Animal Physiology and Endocrinology Award, American Soc. of Animal Science, 2005
- Distinguished Alumnus, Univ. of Connecticut, Agriculture and Natural Resources, 2005
- President- American Society of Animal Science, 2008-2009
- Fellow American Society of Animal Science, 2007
- Animal Management Award, American Society of Animal Science, 2012
- Emeritus Regents Professor, 2014-present
- President—American Registry of Professional Animal Scientists, 2014-present



Immune Cells **Increase Pregnancy Rates** After Embryo Transfer in Cattle

Written by Dr. Craig Gifford



It has been well publicized that the world population is expected to reach nine billion by the year 2050. According to the Food and Agriculture Organization of the United Nations, food production will need to double in order to meet human nutrient demands. Doubling food production is a complex challenge because land space is limiting which means more food production must stem from new technology. In our laboratory, we are trying to address this challenge by finding new ways to help producers overcome limitations of today's production practices.

Reproductive technologies like artificial insemination (AI) and embryo transfer are effective tools that can help producers more rapidly adjust their genetics to meet environmental or market pressures, but these technologies are largely underutilized in the U.S. beef industry. Estimates comparing the value of calves conceived to AI and natural service place an increased value of \$25

per head to over \$50 per head on AI calves. Naturally, the profitability of AI is ranch dependent, but estrus synchronization and AI can have additional advantages such as getting heifers and cows bred earlier in the breeding season, mating specific crosses, reducing bull costs, tightening the calving window, and increased access to superior genetics. Implementing AI programs can be expensive and labor intensive, thus, increasing pregnancy rates when using reproductive technology could entice broader adoption of these practices in the cattle industry.

Reproductive problems resulting in non-pregnant or late pregnant cows negatively impacts the profitability and efficiency of cattle production operations. Infertility and subfertility leads to decreased number of calves born, decreased weaning weights from later calves born, and infertility is the primary reason cows leave the herd which increases replacement costs. In dairy production, repeat breeders and increased days open are a source of economic losses. In both dairy and beef animals, fertilization rates are relatively

high (above 90%) indicating that embryonic loss is a major reason for failed pregnancies. Most embryonic loss occurs within the first three weeks of pregnancy, and much of this loss can be attributed to insufficient uterine receptivity.

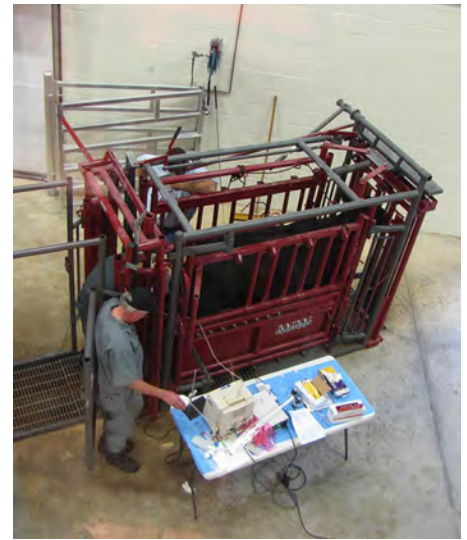
The maternal uterus supports embryonic growth and subsequent placental and fetal development. In order to survive, the embryo must initiate complex biological signaling pathways to "tell" the mother she is pregnant, an event dubbed maternal recognition of pregnancy. The embryo rescues the maternal corpus luteum from lysis allowing maintenance of progesterone production, and, since progesterone is required for pregnancy, maintaining progesterone is a hallmark of maternal recognition of pregnancy. The embryonic signal for maternal recognition of pregnancy in cattle is interferon-tau; interferon-tau secreted from the embryo acts both within the uterus and systemically to signal the mother that she is pregnant. The embryo either derives half or none (embryo transfer) of its genetic material from the mother; thus, the embryo is allogenic and risks being attacked by the maternal

immune system. However, during early pregnancy, the maternal immune system is modulated to allow growth of the allogenic embryo. There is a growing body of evidence to suggest that the maternal immune system actually plays an active role in establishing pregnancy. For example, researchers have found that immune cells collected from blood samples and then transferred to the uterus can increase pregnancy rates in women undergoing in vitro fertilization procedures and subsequent embryo transfer. Our laboratory conducted similar experiments in cattle where immune cells were transferred to the uterine body prior to embryo transfer.

All experiments were conducted at the Kiamichi Link Ranch in Finley, OK. The Kiamichi Link Ranch, one the premiere Angus ranches in the U.S., is owned by Mr. Tucker Link and managed by Dr. Josh Walker. The ranch is equipped with a state of the art embryo laboratory and commonly utilizes in vitro fertilization, super ovulation, embryo flushing, embryo transfer, and AI. After discussing the project with Mr. Link and Dr. Walker, they put their full support into the

project. There are very few places in the U.S. in which these experiments could be conducted with the number of cows necessary to derive meaningful data, so the collaboration between OSU and the Kiamichi Link Ranch was instrumental in accomplishing these experiments.

Together with the Kiamichi Link Ranch and our collaborators, Dr. Troy Ott from Pennsylvania State University, Dr. Dennis Hallford from New Mexico State University, and Dr. Jennifer Hernandez Gifford from Oklahoma State University, blood samples were collected from ninety-seven cows three days after estrus. Peripheral immune cells were isolated from the blood samples, and the immune cells were cultured overnight with interferon-tau. On day four after estrus, the immune cells were transferred to the uterus; for controls, sterile saline was transferred to the uterus of eighty-two cows. On day seven, an embryo was transferred to the uterine horn ipsilateral to the corpus luteum. Pregnancy was evaluated by ultrasonography approximately twenty days after embryo transfer.



Kiamichi Link Ranch ET Facilities

The ninety-seven cows that received immune cells preceding embryo transfer had a pregnancy rate of 77% compared with 57% for control cows (Figure 1). These results indicate that immune cells aid in establishing pregnancy and boost pregnancy rates to embryo transfer. The data are very encouraging and we are conducting experiments in collaboration with Dr. Dave Lalman to adapt this technology for use in AI programs in beef cows. We are also currently working to establish relationships with large dairies in the region to increase pregnancy rates in dairy cows. In addition, this project is a testament to the unique opportunities here in Oklahoma and how we in the Department of Animal Science can work with producers in the State to address problems facing the U.S. beef and dairy industries.

This project was conducted as partial fulfillment of a M.S. degree for Jessica Chase. Other graduate and undergraduate students who helped Jessica with her work include: Bahaa Aloqaily, Belinda Gomez, and Julia Matera.

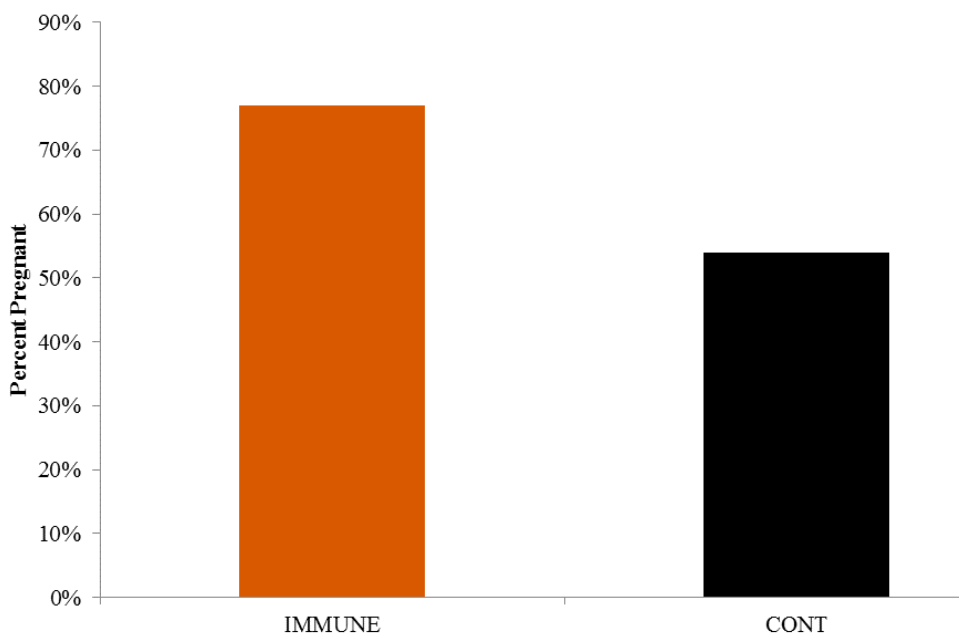


Figure 1. Pregnancy rates in cows that received intrauterine immune cell transfer (IMMUNE; 97 cows) or saline (CONT; 82 cows) prior to embryo transfer. Results showed that immune cell transfer increased pregnancy rates by 20 percentage units.

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Feeding Beef Pairs: Examining Efficiency of Lactation and Calf Gain in a Dry Lot

Written by Dr. David Lalman, Corbit Bayliff, and Miles Redden

Population growth and alternative use of agricultural lands continues at an alarming rate. In fact, the population is anticipated to rise to more than nine billion people by the year 2050. This poses many challenges to food growers around the world, particularly for meat-animal producers. A bottle-neck in the beef industry has been calf supply, especially as recent droughts resulted in the liquidation of many cow-calf operations. Recently, the cow-calf segment of the beef industry has begun the expansion phase in response to strong cattle price signals and improved forage growing conditions. However, availability of grazing land continues to decline for various reasons. Limited grazing land availability, modest feed prices, excess feedyard capacity and high cattle prices are among the factors that have stimulated interest in the expansion of semi-confinement and confinement systems for beef cattle production. Cow-calf production systems have

historically been operated primarily on open pasture and rangeland settings where cow nutrient intake cannot be controlled or evaluated. In grazing situations, voluntary forage intake is extremely difficult to measure and, therefore, accurate estimations of feed efficiency remain unavailable. Faculty and students at Oklahoma State University (OSU) have initiated a number of research and outreach programs to address these issues. Corbit Bayliff, a graduate student in the Department of Animal Science at OSU, is heading up a project looking at improving feed efficiency of cow pairs in confinement during the lactation phase. Corbit's project represents a collaborative effort among a number of Animal Science, Agricultural Economics, and College of Veterinary Medicine faculty and students. The objective of the current project is to identify the level of cow and calf nutrition needed to optimize biological and fiscal efficiency in a

management system where nutrient intake can be controlled. Measurements include lactation yield, milk composition, cow body condition change, calf creep feed intake, and the efficiency of conversion of cow and calf feed intake to cow and calf performance.

The ongoing experiment is being conducted at the Oklahoma State University Range Cow Research Center, South Range Unit, located west of Stillwater, Oklahoma. A total of 40 cow pairs with steer calves are split into groups of eight and housed in five drylot pens containing an automatic water system and a source of shelter and shade. In order to test the effects of nutrient intake, each pen is being fed differing amounts of a single ration. Calves cannot access the cows' feed and cows cannot access the calf creep area. In contrast to the limit-feeding approach to the cows, calves are offered creep feed on a free-choice basis. The



Picture of Corbit Bayliff provided by Oklahoma State University.



Corbit Bayliff collecting milk production data

moderate nutrient level provided to one group of cows is calculated to meet 100 percent of estimated requirements based on calculations from the National Research Council (NRC, 1996). However, these estimates were based on free-choice intake; previous research suggests that limit feeding may increase feed digestibility, thus actually providing more than 100% of the requirements for maintenance and production. Hence, the other four groups are provided 70, 80, 90, and 110 percent of NRC estimated requirements for maintenance and lactation. The ration consists primarily of prairie hay, Sweet Bran® (Cargill wet corn gluten feed), cracked corn, and mineral supplement. The creep feed offered to calves is the same ration that is provided to the cows.

After just twenty-one days on trial, interesting trends are emerging. First of all, these commercial Angus cows produced an average of 30 lb. of milk per day at peak lactation. This compares to the assumption in the latest Beef Cattle Nutrient Requirements publication (NRC, 1996) that commercial beef cows produce an average of 20 lb. of milk per day at peak lactation. After three weeks of receiving the different nutrient levels,

daily milk production has begun to separate as expected. In the most recent measurement, the range in milk yield was 18 to 28 lb. per day with lower nutrient intake resulting in lower milk production. However, it appears that lower milk availability for the calves is being offset by higher calf creep feed intake. Average daily gain of the calves, thus far, are not significantly different between groups. The negative correlation between creep intake and cow energy intake is indicative of higher milk yields and/or a more nutrient dense milk at higher energy intake levels. Although it is very early in this experiment, so far it appears that the more feed fed to the cows, the less efficient the calf gain. Obviously, longer term cow body composition change and reproductive efficiency will need to be considered in the overall efficiency equation.

Limit-feeding higher energy diets to beef cows could become a sustainable component of an intensified beef production system. Historically, this management strategy has been used more extensively in the upper Midwest. Nevertheless, multiple advantages and opportunities from this system are possible in the Southern Great Plains. These include an economical cow

maintenance strategy when feed prices are moderate and pasture ownership or lease rates are expensive, a method to maintain cows during drought rather than forced liquidation, and the opportunity to increase production (stocking rate) on a given ranch unit. However, little information is available to indicate how limit-feeding strategies will effect efficiency of lactating beef cows. OSU Animal Science is working to determine these effects in hopes of leading to a more efficient method for feeding cows — allowing optimal opportunity for regrowth and sustainability of cattle numbers to provide for a rapidly growing population.

A vision for opportunities in the beef cattle industry motivated Dr. Kenneth Eng to establish the Dr. Kenneth and Caroline McDonald Eng Foundation in honor of his late wife Caroline. The Foundation supports applied research and outreach focused on incorporation of cow-calf confinement and semi-confinement systems in beef production. We would like to thank Dr. Eng for his wisdom and support.

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Critical Role of **Animal Science** Research in Food Security and Sustainability

Written by Dr. Sara Place



The world population is expected to reach between 9 and 10 billion people by 2050. Additionally, rising incomes and increasing urbanization is expected to substantially increase global demand for animal protein (meat, milk, eggs, and fish) in the coming decades. Simultaneous to increasing animal protein demand, the productivity of animal agriculture will likely be constrained by climate change and variability, and the availability of natural resources (e.g. water). Additionally, there is increasing interest, in the United States and globally, in the environmental, economic, and social sustainability of animal agriculture.

In the face of the challenging situation outlined above, there are concerns that the current animal science research infrastructure (both physical and human capital) may not be adequate to meet the food security and sustainability needs of the coming decades. In response to these concerns, a committee* was formed by the National Academies to prepare a report to identify the critical areas of research and development, technologies and resources needs for animal science research, both in the U.S. and internationally.

The sponsors of the report were the Association of American Veterinary Medical Colleges, the Bill and Melinda Gates Foundation, the Innovation Center of U.S. Dairy, the National Cattlemen's

Beef Association, the National Pork Board, Tyson Foods, Inc., the U.S. Department of Agriculture, and the U.S. Poultry & Egg Association.

From March 2014 to December 2014, the committee gathered information from expert presentations, reports, and the peer-reviewed literature, wrote and revised the 415-page report after it was peer-reviewed.

Key overarching recommendations of the report include the following:

- To achieve food security, research efforts should be improved through funding efforts that instill integration rather than independence of the individual components of the entire food chain (e.g. from grass-to-plate for beef production).

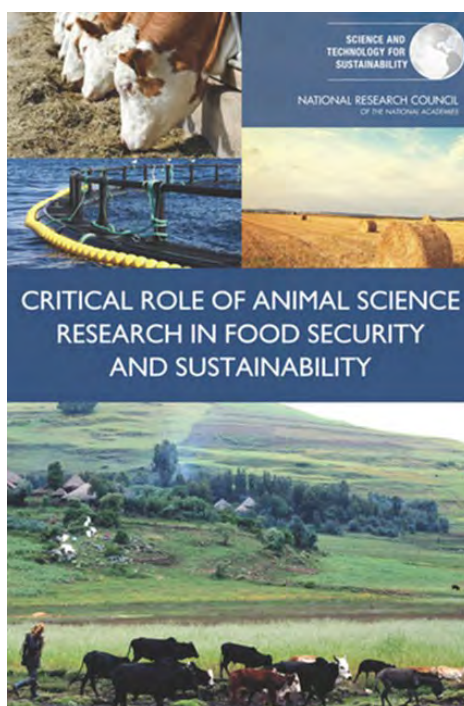


- Continuing the research emphasis on improving animal productivity is necessary; however, concomitant research on the economic, environmental, and social sustainability nexuses of animal production systems should also be enhanced.
- There is a need to revitalize research infrastructure (human and physical resources), for example, through a series of strategic planning approaches, developing effective partnerships, and enhancing efficiency.
- Socioeconomic/cultural research is essential to guide and inform animal scientists and decision makers on appropriately useful and applicable animal science research as well as communication and engagement strategies to deal with these extensive challenges.
- For research in sustainable intensification of animal agriculture to meet the challenge of future animal protein needs, it is necessary to effectively close the existing broad communication gap between the public, researchers, and the food industries.
- The United States should expand its involvement in research that assists in the development of internationally harmonized standards, guidelines, and regulation related to the trade in animal products and the protection of the consumers of those products.

As a part of a land grant university, the Department of Animal Science at Oklahoma State University is well positioned to meet many of the challenges outlined in the report, both through the expertise within our Department and through collaborations with other researchers across campus.

However, continued attention must be drawn to the gap between our current resources, human capital, and physical infrastructure and the challenge of sustainably meeting future food security needs. As the report states, “reinvigorating animal agricultural research is essential to sustainably address the global challenge of food security.”

Beyond the brief primer provided here, the report covers a wide-range of topics, including issues of antimicrobial resistance and the need for alternatives to medically-important antibiotics, diversity and the role of women in animal science research, trends of animal science research funding support in the United States, and recommendations for research approaches related to sustainability in the animal sciences. To read the full report, it can be downloaded for free as a pdf or purchased as a hard copy for \$70.10 from the National Academies Press website at <http://www.nap.edu/catalog/19000/critical-role-of-animal-science-research-in-food-security-and-sustainability>.



*Membership of the “Committee on Considerations for the Future of Animal Science Research”:

Bernard D. Goldstein (Chair) (member of the Institute of Medicine), Professor Emeritus, Department of Environmental and Occupational Health, University of Pittsburgh Graduate School of Public Health; Louis D’Abramo, William L. Giles Distinguished Professor of Wildlife, Fisheries and Aquaculture, Mississippi State University; Gary F. Hartnell, Senior Fellow, Chemistry Technology, Monsanto Company; Joy Mench, Professor of Animal Science and Director of the Center for Animal Welfare, University of California, Davis; **Sara Place, Assistant Professor of Sustainable Beef Cattle Systems, Oklahoma State University;** Mo Salman, Professor of Veterinary Epidemiology, Colorado State University, and Jefferson Science Fellow, U.S. Department of State; Dennis H. Treacy, Executive Vice President and Chief Sustainability Officer, Smithfield Foods, Inc.; B. L. Turner II (member of the National Academy of Sciences), Gilbert F. White Professor of Environment and Society, Arizona State University; Gary W. Williams, Professor of Agricultural Economics and Co-Director, Agribusiness, Food, and Consumer Economics Research Center, Texas A&M University; Felicia Wu, John A. Hannah Distinguished Professor of Food Science and Human Nutrition and Agricultural, Food and Resource Economics, Michigan State University.

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Animal Science 4-H STEM Institute

Written by Dr. Jennifer Hernandez Gifford



On July 14th and 15th, 2015, research faculty in the Department of Animal Science hosted a group of students from Tulsa Juntos 4-H to participate in activities conducted

during the STEM (Science, Technology, Engineering and Math) workshop. The Animal Science component of the workshop was designed to promote discovery of science through hands on experiences. The two day workshop was

developed and directed by the Gifford Lab including: Drs. Craig Gifford and Jennifer Hernandez Gifford and graduate students, Belinda Gomez and Rita Flores. This workshop was made possible by support and generous contributions from Dr. Cynda Clary, Associate Dean of Academic Programs, Dr. Clint Rusk, Head of the Department of Animal Science and Dr. John Gustafson, Head of the Department of Biochemistry and Molecular Biology.

Juntos 4-H is a drop-out prevention program that provides coaching to 8th and 9th grade Hispanic students. A major goal of our involvement in this workshop is to improve scientific literacy in minority youth. In addition to teaching the students about science through our DNA parentage workshop, these students also had the opportunity to ride horses and get a roping demonstration. Dr. Steven Cooper and his graduate student, Sarah Shobert, coordinated the horse riding activities for the 31 students. For many of these students this was their first experience with any large animal and they really enjoyed the interaction with the horses.



The students participating in the Animal Science workshop were exposed to research techniques and introduced to the basic concepts of biology. These activities enabled students to identify parentage/relationship of a group of young horses to several potential sires (stallions). The students predicted which stallion fathered the offspring based on what the horse looks like. Then they compared their prediction to the actual DNA profile.

To understand the basic principles of the workshop, DNA from horse hair follicles was collected from the manes of horses

located at the OSU Horse Farm. Next began the isolation of DNA which included cutting several strands of hair collected from the mane of different horses. In this process the students learned how to use air-displacement pipets and were introduced to sophisticated lab techniques like PCR and DNA sequencing. On day two, a little lab fun was introduced as the students were able to make Dipping Dots and got to enjoy eating their products.

The workshop was a huge success, largely due to the outpouring of support to make it happen. Dr. Steve Hartson, Director of DNA Sequencing, Mass Spectrometry and Core Facility kindly provided the fragment analysis of our DNA samples. Dr. Hartson also generously took time to give the students a tour of the core facility located in the Henry Bellmon Research Center. During this tour these students were able to experience a state-of-the-art research facility and Dr. Hartson explained to the students that they are living through a technological revolution.

The students learned a lot from the activity and I am certain that we touched some lives through this workshop. It was clear from our interactions with the students that they have unlimited potential and talent – a goal of the workshop was to help them realize their potential.



OSU graduate student Rita Flores (right) showing a student how to use lab equipment. Rita helped instruct students during the STEM Workshop.

Rita is working on her Ph.D. in animal science with an emphasis in physiology and is a USDA Ph.D. Fellow. She is mentored by Dr. Jennifer Hernandez Gifford.



OSU graduate student Belinda Gomez (left) showing a student how to use lab equipment. She helped instruct students during the STEM Workshop.

Belinda is working on her Ph.D. in animal science with an emphasis in physiology and is a USDA Ph.D. Fellow. She is mentored by Dr. Jennifer Hernandez Gifford.



Associate Professor Dr. Jennifer Hernandez Gifford teaching 4-H students how to use a pipette.

Dr. Hernandez Gifford is the research coordinator for the ANSI Undergraduate Research Program.

She teaches ANSI 3414: Form and Function of Livestock and ANSI 5123: Functional and Molecular Endocrinology.



Associate Professor Dr. Steven Cooper telling the students about different breeds of horses.

Dr. Cooper supervises equine teaching and the equine research center for our department. He is also director of the Oklahoma Quarter Horse Association, advisor for the Horseman's Association, and coach of the Horse Judging Team.

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Animal Science UG Research Scholars

Written by Jamie Sadler and Dr. Jennifer Hernandez Gifford

The Animal Science Undergraduate Research Scholars Program is designed to foster interest in science-based careers and graduate school. Animal Science Research Scholars participate in independent departmental research and are provided the unique opportunity to work alongside faculty experts in each discipline. Students gain hands-on research experience and often work with graduate students conducting research at a lab or farm unit.

The multi-year program is centered on the long-term development and engagement of undergraduates in research; it is set apart from other similar research programs on campus as students are given the opportunity to participate in research for up to four years as long as program requirements are met. Including undergraduates in research enables long-term development and engagement of the scientific methods, critical thinking and communication of scientific knowledge through poster and oral presentations.

This program continues to grow and is currently supporting twenty-one Animal Science students who participated in the Undergraduate Research Scholars Program in 2014-2015. The faculty's impressive involvement and support in this program is what makes it so successful. Many faculty members mentor multiple Research Scholars. Fifteen of our faculty members are serving as mentors for the twenty-one students. Undergraduate research scholars are encouraged to present their research at a variety of local and national scientific venues.

This summer, undergraduate students from the Animal Science Undergraduate Research Scholars Program presented

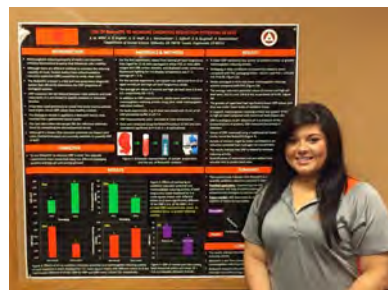
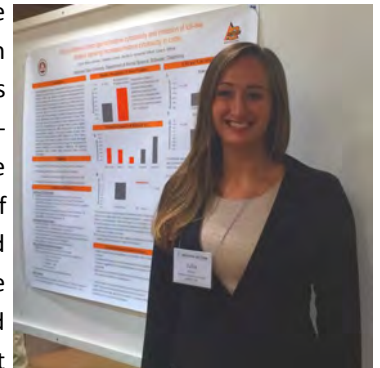
research posters; several were recognized with first and second place awards for their research poster presentations.

ANSI Research Scholars Present Posters



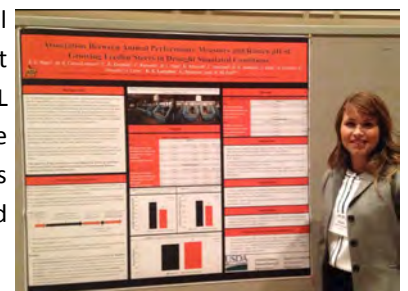
Ashtin Bechtold, is an Animal Science Undergraduate Research Scholar who presented her poster titled "WHO FILLS THE SEAT: Student Perception of Current and Contemporary Issues Facing Food and Animal Agriculture" at the North American Colleges and Teachers of Agriculture conference, held June 16-19 in Athens, GA. Ashtin was awarded first place in the poster competition. Ms. Bechtold is mentored in research by Dr. Dan Stein. She is a senior at OSU, double majoring in Animal Science Production and Agricultural Communications. Read more on page 27.

Julia Matera, an Animal Science Undergraduate Research Scholar and a two-time Niblack Research Scholar, presented her poster titled "Serum proteins protect against histone toxicity and inhibition of toll-like receptor signaling increases in histone cytotoxicity in cattle" at the Western Section of American Society of Animal Science Meeting, held June 23-26 in Ruidoso, NM. Julia received first place for her poster presentation. Ms. Matera is mentored in research by Dr. Craig Gifford. She is a senior at OSU, double majoring in Pre-Vet Animal Science and Pre-Med Biochemistry/Molecular Biology.



Kendra Wills, an undergraduate Animal Science student, presented her research at the Reciprocal Meat Conference, held June 19-22 in San Angelo, TX. Kendra was recognized with a second place award for her poster titled "Use of RedoxSys to measure oxidation reduction potential in beef". Ms. Wills is mentored in research by Dr. Ranjith Ramanathan, and earned her Bachelor of Science degree in May. Kendra will continue her studies here at OSU, beginning her Master of Science in Food Science program in August. Read more on page 26.

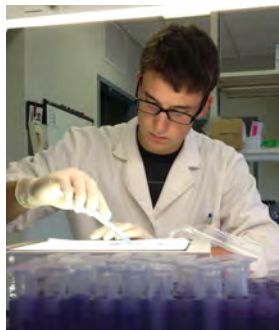
Kyre E. Larrabee, an undergraduate Animal Science student, presented a poster at the Joint Annual Meeting for ASAS-ADSA in Orlando, FL titled "Associations between animal performance measures and rumen pH of growing feedlot steers in drought simulated conditions." Kyre is mentored by Dr. Sara Place.



ANSI Research Scholars Complete Their Degrees

In May, four Animal Science Undergraduate Research Scholars graduated and they each have big plans for the next phase of their life. We want to take a moment to recognize these students for their accomplishments and wish them well in their new adventures.

Jessica Neal participated in research as an Animal Science Research Scholar and a 2013 Niblack Research Scholar. Jessica was an active student in the department and was involved in a wide-variety of activities, including being a member of the winning 2015 OSU Animal Science Quadrathlon and equine judging team. Ms. Neal also earned several awards and distinctions in the 2014-15 year, including: CASNR Outstanding Senior; CASNR Senior of Distinction; CASNR Dean's Award of Excellence; Senior of Significance; and the Animal Science Senior Scholastic Achievement Award. She will be attending the University of Missouri in the fall 2015, and will be working towards a Master's Degree in Animal Science Bioinformatics under Dr. Taylor.



Nick Elroy participated in research continuously throughout his undergraduate career. Nick was selected as a Fleming scholar and participated in a research experience at the Oklahoma Medical Research Facility in the summer of 2012. He was also a 2012 University Freshman Research Scholar and a 2013 Wentz Research Scholar. He continued his final year as an Animal Science Research Scholar and his research resulted in a first author publication. Nick was accepted into the 3 + 1 early admission program of veterinary school at OSU for the fall of 2015.

Kyre Larrabee was active in research through the Animal Science Research Scholars program and was a 2013 Wentz Research Scholar. Kyre also participated in numerous leadership activities in the department including serving as the 2014-15 Animal Science Leadership Alliance President. Ms. Larrabee received several awards and distinctions in the 2014-15 year, including: CASNR Senior of Distinction; and the Animal Science Senior Scholastic Achievement Award. She is currently working at White Veterinary Hospital under the mentorship of Drs. Bret White and Tammie White. Kyre will be applying to the OSU Center for Veterinary Health Sciences for a fall 2016 acceptance.



Sarah Schobert was introduced to Animal Science research as a senior and was selected as a 2014 semester Wentz Research Scholar. Sarah will continue her scientific endeavors in a Masters program in Animal Science this June. Sarah will be mentored in her studies by Dr. Steven Cooper. Sarah received several awards and distinctions in the 2014-15 year, including: CASNR Senior of Distinction; CASNR Dean's Award of Excellence; and the Animal Science Senior Scholastic Achievement Award.

University Research Awards

Julia Matera received the Undergraduate Library Research Award. Julia is mentored by Dr. Craig Gifford. This university-wide competitive award supports and highlights excellence in research and critical thinking. One winner is selected annually. This award recognizes the many accomplishments achieved by Ms. Matera throughout her undergraduate experiences in research. Read more on page 25.

Complementing the departmental research program, faculty members prepare and support Niblack Research Scholars, Wentz Research Scholars, and Freshman Research Scholars. The 2015-2016 University Research Award winners were announced in May 2015 and our department will be well represented in these programs.

Six students in the Department of Animal Science will continue their research in the 2015-16 academic year with the support of either a Niblack Research Award or a Wentz Research Award. These students will be beginning their respective research roles in the 2015 fall semester.

2015-2016 Niblack Research Scholars:

Alexis Gullic, mentored by Dr. Jennifer Hernandez Gifford, and **Hannah Paradis**, mentored by Dr. Glenn Zhang.

2015-2016 Wentz Research Scholars:

Shiann Burns, mentored by Dr. Yinghua Huang, **Carson Cooper**, mentored by Dr. Scott Carter, **Caleb Smith**, mentored by Dr. Hernandez Gifford, and **Sydney Stewart**, mentored by Dr. Glenn Zhang.

The program is directed by Dr. Jennifer Hernandez Gifford and co-advised by Dr. Dan Stein.

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Cow-calf Producers Should Register Now to Attend Sept. 17-18 Eng Symposium in OKC

Written by Donald Stotts

OKLAHOMA CITY – Cattle producers operating intensive beef cow production systems can ensure they are aware of the latest animal care and management innovations by attending the Sept. 17-18 Dr. Kenneth and Caroline McDonald Eng Foundation Symposium in Oklahoma City.

“It’s a great opportunity to interact with and ask questions of some of the region’s top experts in the field about new research findings that target improvements relative to beef-cow efficiency and profitability in intensive and semi-confined production systems,” said Dave Lalman, Oklahoma State University Cooperative Extension beef cattle specialist.

Research conducted through grants provided by the Dr. Kenneth & Caroline McDonald Eng Foundation will be a particular focus.

The two-day event is being hosted by OSU, Texas A&M University and the University of Nebraska. The symposium will begin at 1 p.m. on Thursday, Sept. 17 and conclude at approximately noontime on Friday, Sept. 18.

Cost is \$125 per participant if pre-registering and \$150 at the door. University graduate students are eligible to register at the discount price of \$50. Online registration is available through



the symposium website at <http://www.mcdonaldengsymposium.org>.

The symposium will take place at the Skirvin Hilton Hotel’s Centennial Ballroom, 1 Park Ave. in downtown Oklahoma City. For those wishing to stay at the hotel, a block of rooms has been reserved for Sept. 15 through Sept. 18.

Hotel reservation information is available online via the symposium registration site.

“The special room rate for symposium participants will be available until Aug. 26 or until the block of rooms is sold out,” Lalman said. “We ask participants to pre-register if at all possible as it greatly aids in our planning for conference materials, refreshment breaks and the like.”

Denver’s Don Close of Rabobank will lead the symposium’s first session about confined cow-calf production being a viable model for rebuilding the U.S. cow herd.

OSU alumnus Rick Rasby, University of Nebraska Cooperative Extension beef cattle specialist, will provide insights about the economics of alternative cow-calf production systems.

Ryan Reuter, OSU associate professor of range beef cattle nutrition, will share how ranchland ecosystem services can be enhanced with semi-confinement systems.

Andy Herring, the holder of Texas A&M’s John K. Riggs ’41 Beef Cattle Professorship, will lead a session detailing non-typical genetic effects and their implications for intensive beef cow production systems.

Jason Sawyer, Texas A&M associate professor of beef cattle science and

superintendent of the university’s McGregor Research Center, will share strategies to enhance cow efficiency in intensive systems.

University of Nebraska researcher Jason Warner will share study findings about optimizing the use of corn residues relative to grazing and harvest.

OSU veterinarian Dr. Jared Taylor will provide insights about the health management of neonatal calves born in confinement systems.

In addition, Kenneth Eng will moderate a round-table-panel discussion featuring “hands-on intensive cow-calf producers” from both northern and southern Great Plains states.

The Dr. Kenneth & Caroline McDonald Eng Foundation was established in 2011 by Eng in memory of and as a legacy to his wife, Caroline, who loved life, cattle and cattle producers, and to provide research money to universities to study cow-calf efficiency with the ultimate goal of enhancing the long-term economic sustainability of the U.S. beef industry’s cow-calf sector.

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Invited Presentations

Below are the 2014 invited research presentations for Oklahoma State University Department of Animal Science.

Dr. Michelle Calvo-Lorenzo

“Practical developments in managing animal welfare in beef cattle. What does the future hold?” Bill E. Kunkle Interdisciplinary Beef Symposium at the 2014 ASAS Southern Section Meeting. Dallas, TX. February, 2014.

“Animal welfare in the beef cattle industry: Current topics and research development.” Plains Nutrition Council. San Antonio, TX. April, 2014.

“What are research ethics?” ADSA-ASAS-CSAS Joint Annual Meeting. Graduate Student Symposium. Kansas City, KS. July, 2014.

“Mobility scoring.” American Meat Institute (AMI) Foundation. Animal Care and Handling Conference. Kansas City, MO. October, 2014.

Dr. Craig Gifford

“Applied reproductive strategies in beef cattle.” Beef Reproduction Task Force. Stillwater, OK. October 9, 2014.

Dr. Jennifer Hernandez Gifford

“WNT signaling regulation of ovarian steroid production: Establishment of a negative feedback loop on FSH target genes.” Center for Reproductive Biology Seminar Series. Washington State University. March 12, 2014.

“Contributions of the canonical WNT signaling pathway in adult ovarian folliculogenesis.” F21C Reproductive Biology Seminar Series. University of Missouri. October 8, 2014.

Dr. Clint Krehbiel

“Strategies to diagnose ruminal acidosis and to accelerate recovery of the rumen epithelium.” XVIII Curso Novus Enfoques na Produção e Reprodução de Bovinos. Uberlândia, Minas Gerais, Brazil. March 20, 2014.

(Dr. Clint Krehbiel Continued)

“Adaptation programs for starting cattle on feed: Maximizing intake and minimizing acidosis.” XVIII Curso Novus Enfoques na Produção e Reprodução de Bovinos. Uberlândia, Minas Gerais, Brazil. March 20, 2014.

“Dietary sugar sources for dairy cattle: Implications on rumen fermentation and production.” XVIII Curso Novus Enfoques na Produção e Reprodução de Bovinos. Uberlândia, Minas Gerais, Brazil. March 21, 2014.

“Nutrition and management impacts on marbling development in growing and finishing beef cattle.” XVIII Curso Novus Enfoques na Produção e Reprodução de Bovinos. Uberlândia, Minas Gerais, Brazil. March 21, 2014.

Dr. David Lalman

“Intensified cow/calf production in Southern Great Plains using wheat pasture, semi-confinement and cover crops.” Kenneth and Caroline McDonald Eng Foundation Symposium. San Antonio, TX. September 19, 2014.

Dr. Sara Place

“Cow Efficiency: Implications for Beef Sustainability.” Kenneth and Caroline McDonald Eng Foundation Symposium. San Antonio, TX. September 18, 2014.

Dr. Megan Rolf

“Project update and findings for the identification and management of alleles impairing heifer fertility while optimizing genetic gain grant.” National Beef Cattle Evaluation Consortium’s Brown Bagger Webinar. October 22, 2014.

Dr. Leon Spicer

“An update on the role of the hedgehog system during dominant follicle development.” Department of Health, Animal Science and Food Safety. University of Milan, Italy. 2014.

Dr. Bob Wettemann

“Applied reproductive strategies in beef cattle.” Beef Reproduction Task Force. Stillwater, OK. October 9, 2014.

“Fetal nutritional programming and postnatal growth of Calves.” Oklahoma State University College of Veterinary Health Sciences Annual Fall Conference for Veterinarians. Stillwater, OK. November 14, 2014.

Dr. Glenn Zhang

“Boosting innate immunity and disease resistance by modulating antimicrobial host defense peptide synthesis.” Avian Immunology Research Group Meeting (AIRG 2014). Guelph, Ontario, Canada. July 17, 2014.

“Disease control and prevention by modulating innate immunity.” College of Animal Science and Technology. China Agricultural University. Beijing, China. December 23, 2014.

“Dietary modulation of animal immunity.” College of Animal Science and Technology. Beijing University of Agriculture. Beijing, China. December 24, 2014.

“Nutritional modulation of innate immunity: implications for the development of antibiotic-free diets.” College of Animal Science and Nutritional Engineering. Wuhan Polytechnic University. Hubei, China. December 29, 2014.

Faculty Publications

Below are 2014 **publications** for the Department of Animal Science. (Faculty members are indicated by *).

Buddhini, P. K., J. Jones, S. Ravishankar, and *D. Jaroni. 2014. Evaluating the efficacy of olive, apple and grape seed extracts in reducing *Escherichia Coli* O157:H7 contamination on organic leafy greens during the wash process. *International Journal of Food Science, Nutrition and Dietetics* 03(10):164-170.

Cooper-Prado, M. J., N. M. Long, M. P. Davis, E. C. Wright, R. D. Madden, *J. W. Dilwith, C. L. Bailey, *L. J. Spicer, and *R. P. Wettemann. 2014. Maintenance energy requirements of beef cows and relationship with cow and calf performance, metabolic hormones, and functional proteins. *Journal of Animal Science* 92(8):3300-3315.

Cortinovis, C., F. Caloni, N. B. Schreiber, and *L. J. Spicer. 2014. Effects of fumonisin B1 alone and combined with deoxynivalenol or zearalenone on porcine granulosa cell proliferation and steroid production. *Theriogenology* 81(8):1042-1049.

Evans, J. R., N. B. Schreiber, J. A. Williams, and *L. J. Spicer. 2014. Effects of fibroblast growth factor 9 on steroidogenesis and control of *FGFR2IIIc* mRNA in porcine granulosa cells. *Journal of Animal Science* 92(2):511-519.

Jiang, Y., M. Xie, W. Chen, R. Talbot, J. F. Maddox, T. Faraut, C. Wu, D. M. Muzny, Y. Li, W. Zhang, J. A. Stanton, R. Brauning, W. C. Barris, T. Hourlier, B. L. Aken, S. M. Searle, D. L. Adelson, C. Bian, G. R. Cam, Y. Chen, S. Cheng, *U. DeSilva, K. Dixen, Y. Dong, G. Fan, I. R. Franklin, S. Fu, P. Fuentes-Utrilla, R. Guan, M. A. Highland, M. E. Holder, G. Huang, A. B. Ingham, S. N. Jhangiani, D. Kalra, C. L. Kovar, S. L. Lee, W. Liu, X. Liu, C. Lu, T. Lv, T. Mathew, S. McWilliam, M. Menzies, S. Pan, D. Robelin, B. Servin, D. Townley, W. Wang, B. Wei, S. N. White, X. Yang, C. Ye, Y. Yue, P. Zeng, Q. Zhou, J. B. Hansen, K. Kristiansen, R. A. Gibbs, P. Flicek, C. C. Warkup, H. E. Jones, V. H. Oddy, F. W. Nicholas, J. C. McEwan, J. W. Kijas, J. Wang, K. C. Worley, A. L. Archibald, N. Cockett, X. Xu, W. Wang, and B. P.

(continued)

Dalrymple. 2014. The sheep genome illuminates biology of the rumen and lipid metabolism. *Science* 344(6188):1168-1173.

*Krehbiel, C. R. 2014. Invited Review: Applied nutrition of ruminants: Fermentation and digestive physiology. *The Professional Animal Scientist* 30(2):129-139.

Lancaster, P. A., *C. R. Krehbiel, and *G. W. Horn. 2014. A meta-analysis of effects of nutrition and management during the stocker and backgrounding phase on subsequent finishing performance and carcass characteristics. *The Professional Animal Scientist* 30(6):602-612.

Lancaster, P. A., E. D. Sharman, *G. W. Horn, *C. R. Krehbiel, and J. D. Starkey. 2014. Effect of rate of weight gain of steers during the stocker phase. III. Gene expression of adipose tissues and skeletal muscle in growing-finishing beef cattle. *Journal of Animal Science* 92(4):1462-1472.

Liu, H., J. Zhang, S. Zhang, F. Yang, P. A. Thacker, *G. Zhang, S. Qiao, and X. Ma. 2014. Oral administration of *Lactobacillus fermentum* I5007 favors intestinal development and alters the intestinal microbiota in formula-fed piglets. *Journal of Agricultural and Food Chemistry* 62(4):860-866.

Lyles, J. L. and *M. S. Calvo-Lorenzo. 2014. Bill E. Kunkle Interdisciplinary Beef Symposium: Practical developments in managing animal welfare in beef cattle: what does the future hold? *Journal of Animal Science* 92(12):5334-5344.

Mancini, R. A. and *R. Ramanathan. 2014. Effects of postmortem storage time on color and mitochondria in beef. *Meat Science* 98(1):65-70.

Maxwell, C. L., *C. R. Krehbiel, *B. K. Wilson, B. T. Johnson, B. C. Bernhard, C. F. O'Neill, *D. L. VanOverbeke, *G. G. Mafi, *D. L. Step, and *C. J. Richards. 2014. Effects of beef production system on animal performance and carcass characteristics. *Journal of Animal Science* 92(12):5727-5738.

McMurphy, C. P., A. J. Sexten, G. L. Mourer, M. J. Rincker, and *D. L. Lalman. 2014. Effects of including saponins (Micro-Aid®) in a protein supplement on performance of growing steers and spring-calving cows. *Animal Feed Science and Technology* 190:19-29.

McMurphy, C. P., A. J. Sexten, G. L. Mourer, E. D. Sharman, S. J. Trojan, M. J. Rincker, W. K. Coblenz, and *D. L. Lalman. 2014. Effects of including saponins (Micro-Aid®) on intake, rumen fermentation and digestibility in steers fed low-quality prairie hay. *Animal Feed Science and Technology* 190:47-58.

Nair, M. N., S. P. Suman, S. Li, *R. Ramanathan, and R. A. Mancini. 2014. Temperature- and pH-dependent effect of lactate on in vitro redox stability of red meat myoglobins. *Meat Science* 96(1):408-412.

Nerimetla, R., C. Walgama, *R. Ramanathan, and S. Krishnan. 2014. Correlating the electrochemical kinetics of myoglobin-films to pH dependent meat color. *Electroanalysis* 26(4):675-678.

O'Bryan, C. A., P. G. Crandall, M. L. Davis, G. Kostadini, K. E. Gibson, W. Q. Alali, *D. Jaroni, S. C. Ricke, and J. A. Marcy. 2014. Mobile poultry processing units: a safe and cost-effective poultry processing option for the small-scale farmer in the United States. *World's Poultry Science Journal* 70(04):787-802.

*Place, S. E. 2014. Climate change: Animal systems. Pages 244-255 in *Encyclopedia of Agriculture and Food Systems*. N. K. V. Alfen, ed. Academic Press, Oxford.

*Place, S. E. and F. M. Mitloehner. 2014. The nexus of environmental quality and livestock welfare. *Annual Review of Animal Biosciences* 2:555-569.

*Ramanathan, R., R. A. Mancini, S. P. Suman, and C. M. Beach. 2014. Covalent binding of 4-hydroxy-2-nonenal to lactate dehydrogenase decreases NADH formation and metmyoglobin reducing activity. *Journal of Agricultural and Food Chemistry* 62(9):2112-2117.

Soto-Navarro, S. A., R. Lopez, C. Sankey, B. M. Capitan, B. P. Holland, L. A. Balstad, and *C. R. Krehbiel. 2014. Comparative digestibility by cattle versus sheep: effect of forage quality. *Journal of Animal Science* 92(4):1621-1629.

Stapp, A. D., *C. A. Gifford, D. M. Hallford, and *J. A. Gifford. 2014. Evaluation of steroidogenic capacity after follicle stimulating hormone stimulation in bovine granulosa cells of Revalor 200 (R) implanted heifers. *Journal of Animal Science and Biotechnology* 5(1):2.

Stapp, A. D., B. I. Gómez, *C. A. Gifford, D. M. Hallford, and *J. A. Hernandez Gifford. 2014. Canonical WNT signaling inhibits follicle stimulating hormone mediated steroidogenesis in primary cultures of rat granulosa cells. *PLoS ONE* 9(1):e86432.

Wright, E. C., B. H. Boehmer, M. J. Cooper-Prado, C. L. Bailey, and *R. P. Wettemann. 2014. Effect of elevated ambient temperature at parturition on duration of gestation, ruminal temperature, and endocrine function of fall-calving beef cows. *Journal of Animal Science* 92(10):4449-4456.

*Zhang, G. and L. T. Sunkara. 2014. Avian antimicrobial host defense peptides: from biology to therapeutic applications. *Pharmaceuticals* 7(3):220-247.

Research Interests

Scott Carter - Impact of diet on nutrient excretion and gaseous emissions; effect of alternative feedstuffs on growth performance and carcass traits; and effects of feed additives in on growth performance and carcass traits.

Udaya DeSilva - Metagenomics of rumen and other microflora and microbial ecology of soil treated with animal manure.

Craig Gifford - Mechanisms regulating maternal recognition of pregnancy in cattle; role of the maternal immune system in pregnancy; Identification of novel methods to increase reproductive rates when using reproductive technologies; and interferon response and histone toxicity in animal health and disease.

Jennifer Hernandez Gifford - Identifying the mechanisms by which WNT contributes to ovarian steroid production and how these signals may impact estrogen levels in health and disease.

Gerald Horn - Stocker cattle nutrition and management; and effects of grazing systems and application of technologies on subsequent feedlot performance and carcass value.

Divya Jaroni - Development of effective strategies to control foodborne pathogens at pre-harvest and post-harvest levels.

Clint Krehbiel - Tissue and whole-animal energy and protein metabolism in ruminants; regulation of lipid metabolism in ruminants; impact of animal health and immune function on animal growth and carcass merit; nutritional/management strategies of adapting and subsequently feeding beef cattle on high-concentrate diets while minimizing risk of metabolic disorders; and systems research to improve efficiency of nutrient utilization by growing and finishing ruminants.

David Lalman - Cow/calf and stocker cattle applied nutrition and management; cow efficiency and forage utilization; and beef production systems.

Gretchen Mafi - Prediction of meat tenderness and palatability; development of value-added meat products; and use of new technology to predict quality.

Peter Muriana - Use of natural antimicrobials to prevent spoilage and pasteurization of intact shell eggs to eradicate salmonella.

Sara Place - Sustainability (environmental, economic, and social) of cattle systems; and measurement and mitigation of enteric methane emissions.

Ranjith Ramanathan - Postmortem muscle biochemistry and meat quality; application of metabolomics in meat quality research; role of mitochondria in beef color; and myoglobin and lipid oxidation.

Ryan Reuter - Forage-based beef cattle nutrition and management; effects of supplementation and grazing management on beef cattle production and sustainability; and incorporating technology into grazing systems.

Chris Richards - Feedlot/stocker cattle applied nutrition and management.

Megan Rolf - Use of genetics to improve adaptability to environmental stressors in livestock and use of genomics for genetic improvement of economically relevant traits in livestock.

Leon Spicer - In vitro and in vivo approaches to study nutritional and hormonal control of ovarian function and follicular development including the study of insulin-like growth factor-I (IGF-I) as an endocrine factor linked to energy balance in early lactating dairy cows; and the study of metabolic factors such as leptin, IGF-I and the IGF system in ovarian follicular function and milk production.

Deborah VanOverbeke - Effect of management practices on meat yield, quality, palatability and sensory attributes; evaluation of post harvest management techniques to improve meat quality; and prediction of tenderness and palatability.

Robert Wettemann - Reproduction and endocrine function of beef cattle; identification of biomarkers that can be used to classify beef cows that are more efficient and require less energy for maintenance of body weight and energy stores; and determination of the effects of prenatal nutritional programming of the bovine fetus on mechanisms that regulate growth, development, and performance.

Blake Wilson - Applied beef cattle nutrition and management; health, immune function, and management of high-risk calves during the receiving/backgrounding period; and internal parasite control in sheep.

Glenn Zhang - Modulating synthesis of endogenous host defense peptides (HDPs) for disease control and prevention; structure-activity relationship studies of novel HDPs (bacterial killing and/or immunomodulation); and role of microbiota in animal health and productivity.

Research Grants

Below are active **continuing grants** for 2015 in the Department of Animal Science that are nationally competitive.

Dr. Scott Carter (PI). Design4 and ENSOL, LLC. Efficacy of low-cost waste treatment tanks to reduce the potential environmental effects of manure. 10/15/13 – 12/31/15. \$14,287.

Dr. Steven Cooper (PI). Land O'Lakes, Inc. Energex equine trial. 6/1/12 – Completion. \$17,392.

Dr. Jennifer Hernandez Gifford (PI). NIFA/USDA. National Needs Fellowship Program in application of genomic and computational biology to animal production. 2/1/13 – 1/31/18. \$238,500.

Dr. Divya Jaroni (PI). USDA/University of Arizona. Improving the safety and quality of organic leafy greens: Assessment of good production practices along the farm to fork continuum. 1/1/12 – 8/31/15. \$414,530.

Dr. Divya Jaroni (PI). USDA/NIFA. Reduction of Escherichia Coli 0157:h7 on small-scale cow/calf operations using best management practices. 6/1/12 – 1/31/15. \$559,651.

Dr. Clint Krehbiel (PI). Merck Animal Health. Effects of altering beef production systems on animal performance, carcass characteristics, production economics, heat stress, and animal behavior. 3/18/13 – Completion. \$112,200.

Dr. Clint Krehbiel (PI). Feedlot Animal Health. Utilization of near-infrared reflectance spectroscopy technology to characterize feedstuffs procured in beef feedlots in Western Canada. 4/1/13 – 3/31/15. \$88,637.

Dr. Clint Krehbiel (PI). Nutrition Physiology Company. Effect of Bovamine Defend on the performance of beef cattle during the receiving/growing phase. 11/1/13 – 3/1/15. \$52,323.

Dr. Clint Krehbiel (PI). ODAFF. Agriculture research and education extension. 8/1/14 – 6/30/15. \$25,000.

Dr. David Lalman (PI). Alltech, Inc. Effects of Optimase and Rumensin in beef cows. 1/1/13 – Completion. \$68,791.

Dr. David Lalman (PI). KSU/USDA Climate Change. Resilience and vulnerability of beef cattle production in the Southern Great Plains under changing climate, land use and markets. 2/15/13 – 2/14/15. \$155,949.

New Research Grants

Below are **new grants** in the Department of Animal Science as of 12/1/2014.

Dr. Scott Carter (PI). National Pork Board. Undergraduate research in swine nutrition: Evaluation of plant proteins for nursery pigs. 12/12/2014 – 12/31/2015. \$5,000.

Dr. Ravi Jadeja (PI). Technology Business Development Program (TBDP). Novel antimicrobial ice based meat grinder sanitation process. 5/21/2015 – 5/31/2016. \$15,000.

Dr. Clint Krehbiel (PI). Zoetis. Evaluation of Actogain on grown performance and carcass characteristics of feedlot Holstein steers. 12/23/2015 – 9/1/2015. \$227,638.

Dr. Sara Place (PI). USDA NIFA. Enteric methane emissions measurement system for grazing beef and dairy cattle. 4/1/2015 – 3/31/2016. \$31,140.

Dr. Ranjith Ramanathan (PI). Oklahoma Center for the Advancement of Science and Technology (OCAST). Enhancing the value of dark cutters by postharvest techniques. 8/1/2015 – 7/31/2016. \$90,000.

Dr. Ryan Reuter (PI). USDA ARS. Sustaining beef production in the Southern Plains through managing greenhouse gas emissions by grazing cattle. 9/1/2015 – 7/31/20. \$71,685.

Dr. Deborah VanOverbeke (PI). Multisorb Technologies, Inc. Multisorb. 3/1/2015 – Completion. \$389,435.

Dr. Guolong (Glenn) Zhang (PI). Cowboy Tech. Natural immune boosting feed additives as alternatives to antibiotics. 1/1/2015 – 12/30/2015. \$60,000.

Dr. Guolong (Glenn) Zhang (PI). Oklahoma Center for the Advancement of Science and Technology (OCAST). Development of next generation antibiotic alternatives. 8/1/2015 – 7/31/2018. \$300,000.

Dr. David Lalman (PI). ADM Alliance Nutrition, Inc. Intake and in-field stability of monensin-containing Mintrate XL 20 pressed tubs fed to stocker cattle grazing summer pastures. 6/15/13 – Completion. \$56,059.

Dr. David Lalman (PI). Intervet, Inc. DBA Merck Animal Health. Effects of Ralgro on growth performance of suckling steer calves in Oklahoma when administered at 30-90 days of age. 4/21/14 – Completion. \$31,325.

Dr. David Lalman (PI). ADM Alliance Nutrition. 1425 ADM Alliance nutrition Rumensin tub study. 7/15/14 – Completion. \$60,233.

Dr. Gant Mourer (PI). Oklahoma Beef Council. Oklahoma Beef Quality Assurance (BQA) expansion initiative. 10/1/14 – 9/30/16. \$37,267.

Dr. Sara Place (PI). NCBA. Current Approaches of beef cattle system life cycle assessment - A review. 2/1/14 – 5/31/15. \$5,422.

Dr. Ranjith Ramanathan (PI). USDA. Application of metabolomics to determine the interrelationship between postmortem metabolite profile and beef color. 1/1/14 – 12/31/15. \$78,626.

Dr. Chris Richards (PI). USDA – AFRI. 2014 Feedlot receiving calf health and well being conference grant. 3/1/14 – 2/28/15. \$10,000.

Dr. Chris Richards (PI). University of Arkansas. Bringing risk management education to producers through YouTube and other social media outlets. 7/1/14 – 6/30/15. \$11,115.

Dr. Megan Rolf (PI). USDA. Beef cattle selection and management for adaptation to drought. 5/1/14 – 4/30/19. \$1,000,000.

Dr. Megan Rolf (Co-PI). Langston University. Genomics of resilience in sheep to climatic stressors. 6/2/14 – 8/31/16. \$124,537.

Dr. Megan Rolf (PI). NIFA Conference Grant. 2014 Applied Reproductive Strategies in Beef Cattle Conference grant. 8/1/2014 – 7/31/15. \$5,000.

Dr. Megan Rolf (PI). TCFA. Use of systems research to improve beef cattle feed and water use efficiency. 9/1/14 – 8/31/19. \$3,360.

Dr. Deborah VanOverbeke (PI). National Beef Packing Company. To investigate the effects of Sodium Metasilicate on organoleptic properties of ground beef. 2/23/12 – 8/31/15. \$15,090.

Dr. Deborah VanOverbeke (PI). National Cattlemen's Beef Association. OSU – Meat science graduate research assistantship. 10/1/13 – 9/30/15. \$30,000.

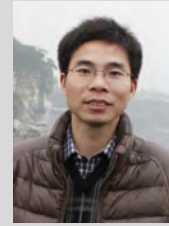
Dr. Deborah VanOverbeke (PI). NIFA/USDA. Instron 5943 dual column tabletop model testing system. 2/1/14 – 1/31/15. \$17,300.

Dr. Deborah VanOverbeke (PI). USDA ARS El Reno. ARS meat quality. 9/1/2014 – 8/31/19. \$15,000.

Dr. Robert Wettemann (PI). SmartStock, LLC. Development of algorithms to determine an increase in ruminal temp in cattle. 6/1/13 – Completion. \$9,882.

Dr. Guolong (Glenn) Zhang (PI). OCAST. Antimicrobial therapy using immunomodulatory peptides (years two and three). 8/1/13 – 7/31/15. \$90,000.

Visiting Scholars



Yingpin Xiao is visiting from the Zhejiang Academy of Agricultural Sciences in China. He joined Dr. Glenn Zhang's lab in July of 2015 to work on the impact of microbiota on poultry performance.



Long Zhang joined Dr. Glenn Zhang's lab working on the development of alternatives to antibiotics in September 2014 on a joint Ph.D. program with Sichuan Agricultural University in China. He is sponsored by China Scholar Council, Ministry of Education to spend the next two years working on comparative analysis of avian host defense peptide genes.



Marco Albonico visited Dr. Leon Spicer's lab for a second time January-May 2015 from the University of Milan in Italy.

His research at OSU involved evaluating the role of mycotoxins on ovarian steroidogenesis and cell proliferation in vitro using bovine granulosa and theca cells.



Hong Li is a visiting scholar from Henan Agricultural University in China. She joined Dr. Glenn Zhang's lab in May of 2015 and is working on the regulation of chicken innate immunity. She will be researching in Dr. Zhang's lab until April of 2016.

Thesis & Dissertations

The following M.S. and Ph.D. students graduated in 2015 during the spring and summer semesters.



Emily Andreini

“Evaluation of an enteric methane emissions measurement system for cattle.”

Emily received her M.S. in animal science with a focus in beef sustainability. She was advised by Dr. Sara Place.

In September, Emily will begin working towards a Ph.D. in the animal biology graduate program at the University of California, Davis. She was also awarded the Herbert Kraft Fellowship by UC Davis.



Justin Buchanan

“Genetic parameter estimation and gene network derivation for fatty acid traits in angus beef cattle.”

He received his Ph.D. in animal science with a focus in breeding and genetics. He has two first author publications. Justin was advised by Drs. Raluca Mateescu and Megan Rolf.

After graduation, Justin and his wife, Carmen, moved to California where he has accepted a position as a Postdoctoral Researcher in the Department of Animal Science at the University of California, Davis.



Brit Boehmer

“Maintenance energy requirements of mature beef cows and relationships with metabolic hormones, adipose gene expression, and calf performance.”

Brit received his Ph.D. in animal science with a focus in physiology, reproduction, and energetic efficiency of beef cattle. He was advised by Dr. Bob Wettemann.

Brit has authored/co-authored two publications. He was awarded the 2014 American Society of Animal Science Joint Annual Meeting Presidential Pick Poster, placed second in the 2014 Whiteman Research Presentation Competition, received the 2012 and 2013 Distinguished Graduate Fellowship and the 2011 Cletis Williams Distinguished Graduate Fellowship. He plans on pursuing a post doctoral position in cellular mechanisms regulating energetic efficiency.



Corey Carpenter

“The effects of dietary energy strategies on growth performance and carcass characteristics of finishing pigs.”

Corey has authored two publications and was awarded the Kansas State University Presidential Doctoral Scholarship. Corey was advised by Dr. Scott Carter and received his M.S. in animal science with a focus in nutrition.

In June, Corey began research and course work at Kansas State University working towards a Ph.D. in animal science. His research will focus on swine nutrition. He will also aid in undergraduate animal science course instruction at K-State.



Kimberly Branham

“Use of ultra high-density SNP data for genetic evaluation of predicted feed intake, feed efficiency, carcass, and growth traits in Hereford cattle.”

Kimberly has authored/co-authored two publications. She has been awarded the Joseph P. Fontenot Travel Award Scholarship for 2015 ADSA-ASAS JAM, Oklahoma Public Health Association Student Scholarship, and Top Tier Fellowship. Kimberly was co-

advised by Drs. Megan Rolf and Michelle Calvo-Lorenzo. She received her M.S. in animal science with a focus in genetics. After graduation, she plans on obtaining a Masters in Genetic Counseling at the OU Health Sciences Center.



Jessica Chase

“Identifying the contributions of interferon responses to disease and pregnancy in cattle.”

Jessica received her M.S. in animal science with a focus in physiology. She was advised by Drs. Craig Gifford and Jennifer Hernandez Gifford.

Jessica Chase was selected to give an oral presentation of her research at the Oklahoma Center for Respiratory Infectious Diseases meeting.

Jessica has accepted the job position of County Extension Agent, Agricultural/Natural Resources, Brazoria County, TX.



Andrea English

“Effects of extended aging on biochemical properties of dark cutting beef.”

Andrea tied for first place in the Whiteman Competition, received first place at the 2015 FAPC/IFT-OK Research Symposium, and was selected as an “Outstanding Masters Student.”

Andrea was advised by Dr. Ranjith Ramanathan and received her M.S. in food science. Andrea will be pursuing her Ph.D. in food safety under Dr. Mindy Brashears at Texas Tech University.



Samantha Lowman

“WHO FILLS THE SEAT: Student Perception of Current and Contemporary Issues Facing Food and Animal Agriculture.”

Samantha received her M.S. in animal science with a focus in physiology. She was advised by Dr. Dan Stein.

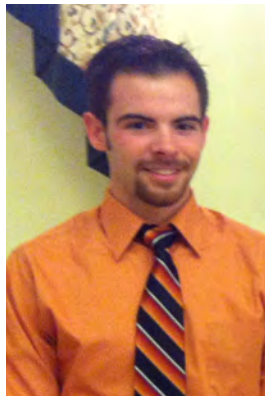
She has accepted a teaching position in the Animal Science department at Southeast Missouri State University at Cape Girardeau, MO.



Li An Fong

“Synergistic introduction of chicken host defense peptide expression by sugars and butyrate.”

Li An was advised by Dr. Glenn Zhang and received his M.S. in animal science with a focus in molecular biology.



Justin Lyles

“The effects of ethyl alcohol as a tool for pain management of neonatal pigs during castration.”

Justin received his M.S. in animal science with a focus in livestock well-being. He was advised by Dr. Michelle Calvo-Lorenzo.



Buddhini Jayasundera

“Identification of contamination sources and prevalence of shiga-toxigenic *E. coli* on small-scale cow/calf operations in Oklahoma and Louisiana.”

Buddhini received second place at the 2015 FAPC/IFT-OK Research Symposium. She was advised by Dr. Divya Jaroni and received her M.S. in food science with a focus in microbiology.



Cheyenne Robinson

“Hormonal regulation of microRNA 221 and its effect on bovine ovarian theca cell function.”

Cheyenne was advised by Dr. Leon Spicer and received her M.S. in animal science with a focus in physiology. She received a travel scholarship to the Applied Reproductive Strategies in Beef Cattle conference.

This fall, Cheyenne will be pursuing a Ph.D. in reproductive physiology at the New Mexico State University Department of Animal and Range Sciences.



“Education is the most powerful weapon we can use to change the world.”

- Nelson Mandela

Awards & Recognition

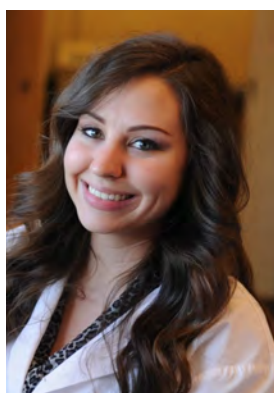
Women's Faculty Council 2015 Research Award



Alexandra Taylor, Department of Animal Science Masters student, received one of the eleven Research Awards given by the Women's Faculty Council in 2015. She received the reward for her excellent research proposal, titled "Evaluation of beef cattle well-being for climate adaptability and habituation to drought." She received \$500 as part of the award.

Alexandra and her adviser, Dr. Michelle Calvo Lorenzo, attended a reception to honor the eleven winners on April 3rd in the Browsing Room at the Edmon Low Library. Each of the winners gave a brief summary of their research at the reception.

3 Minute Thesis Competition



Department of Animal Science Master's alumni Amanda Curtis won the People's Choice Award at a Conference of Southern Graduate School's Three Minute Thesis (3MT) Regional Competition on March 8th, 2015 in New Orleans, Louisiana. Amanda's thesis topic was "Finding alternatives to antibiotics." She received \$250 as part of her award..

When Amanda was a graduate student, she was the first place winner at the 2014 OSU 3MT competition (which qualified her to represent OSU at this regional competition).

The 3MT is a research communication competition that challenges students to present compelling talk on their thesis/dissertation topic and its significance. Students in the competition have only three minutes and one slide to discuss their research to an audience.

Twenty-six graduate students from across the country competed for \$2,500 at the competition, which was held March 8th, 2015 at the Conference of Southern Graduate Schools in New Orleans, LA. Each student was given just 3 minutes and one slide to convey their research to an audience. Judging Criteria was based on communication style, comprehension, and engagement.

Frank Baker Memorial Scholarship

Justin Buchanan, animal science graduate student, was awarded the Frank Baker Memorial Scholarship Award by the Beef Improvement Federation. The award recognizes graduate students for outstanding research and competitive writing.

Justin recently graduated with a Ph.D. in animal science with a focus in breeding and genetics. He has accepted a position as a Postdoctoral Researcher in the Department of Animal Science at the University of California, Davis. Justin was advised by Drs. Megan Rolf and Raluca Mateescu. He is pictured on page 22.

2015 FAPC and IFT-OK Research Symposium

Graduate students Andrea English and Buddhini Jayasundera both received awards at the annual FAPC Research Symposium held by Oklahoma State University's Robert M. Kerr Food & Agricultural Products Center on February 17th, 2015. The symposium consisted of oral and poster presentations; more than 100 researchers and industry representatives attended.

Andrea English won first place in oral presentations, which included a \$250 award. Her title was "Effects of extended aging and modified atmospheric packaging on beef longissimus color." Andrea recently graduated with a M.S. in Food Science and was advised by Dr. Ranjith Ramanathan.

Buddhini Jayasundera won second place in oral presentations, which included a \$150 award. Her research title was, "Identification of contamination sources and prevalence of shiga-toxigenic E. coli on cow/calf operations." Buddhini is pursuing a M.S. in Microbiology and is advised by Dr. Divya Jaroni. The IFT-Oklahoma Section and DuPont Nutrition and Health provided the monetary awards for the winners.



Andrea English receiving first place at the FAPC Research Symposium

Undergraduate Library Research Award



Julia Matera, OSU animal science junior, was the winner of the 2015 Undergraduate Library Research Award. Julia received \$1,500 as part of the award. The overall goals of her research project were to determine whether or not cattle were susceptible to histone toxicity and to see whether or not there is a variability in the protection against the histone toxicity via the bovine serum.

“By determining that variance, we’re going to see if it correlated to the severity of bovine respiratory disease that the calves experienced,” said Julia Matera.

Julia has been very active in undergraduate research. During her time as OSU, she has been a 2012 University Freshman Research Scholar, a two time Niblack Research Scholar (2013-2014 and 2014-2015), and is currently in her third year of the Animal Science Undergraduate Research Scholar Program. She also received a 2015 Wentz Leadership Award, which includes a \$2,750 scholarship for her exceptional academic achievement, leadership, and community service.

Julia has presented her research at numerous scientific venues and was recognized with a second place award at the American Society for Animal Science meeting for her research presentation last summer. Her research has resulted in a first author publication in the Journal of Animal Science. Julia is double majoring in animal science and biochemistry. She is advised by Dr. Jerry Fitch and is mentored in research by Dr. Craig Gifford.

Luis Schutz Presents Poster at International Meeting

Luis F. Schutz, a Ph.D. student under the direction of Dr. Leon Spicer, presented a poster entitled “Relationships among granulosa cell fibroblast growth factor 9 mRNA, follicle size and apoptosis in cattle” at the 41st meeting of the International Embryo Transfer Society in Versailles, France in January of 2015.



Luis is originally from Brazil and is studying animal science with a focus on physiology.

Dr. Paul Vijayakumar Receives Research Award

Dr. Paul Priyesh Vijayakumar was one of six recipients of the Spring 2015 Graduate Research Excellence Award from the OSU Graduate College. The award recognizes outstanding accomplishments reflected in master’s thesis or doctoral dissertations. Paul, who graduated with a Ph.D. in food science in December of 2014, also received a commemorative plaque from Interim Vice President for Research Sheryl Tucker.

Paul is currently working as an Assistant Professor in the Department of Animal and Food Science at the University of Kentucky in Lexington, KY. OSU Animal Science Department Head Dr. Clint Rusk and Dr. Peter Muriana, Paul’s advisor, were present to congratulate Paul.



Left to Right: Drs. Peter Muriana, Paul Vijayakumar, and Clint Rusk

Cashley Ahlberg Awarded Student Support Grant

Cashley Ahlberg was awarded the Walton-Berry Graduate Student Support Grant by the American Simmental Association. The award, which includes \$3,000, was created to aid in professional development and success of young animal scientists by providing support for graduate student study.



Cashley is originally from Colorado and is working towards a Ph.D. in animal science with a focus on genetics. She is advised by Dr. Megan Rolf.

Dr. Glenn Zhang: Excellence in Research



Dr. Glenn Zhang was the recipient of the 2015 Sigma Xi Chapter Lecturer Award in April. Dr. Zhang received a plaque and will be giving a public lecture on his research on October 2nd, 2015. Sigma Xi Chapter 101 recognizes an outstanding scientific researcher each year with the Chapter Lectureship Award.

Additionally, Dr. Glenn Zhang recently received a \$300,000 grant from the Oklahoma Center for Advancement of Science & Technology (OCAST). This three year grant will allow him to research on the commercial development of next-generation antibiotic alternatives. The collaborators of the grant are Dr. Amy Dronberger at Cowboy Technologies LLC, Dr. Scott Carter in the OSU Department of Animal Science, Dr. Jerry Ritchey in the OSU Department of Veterinary Pathobiology, and Dr. Zech Xu at UC San Diego.

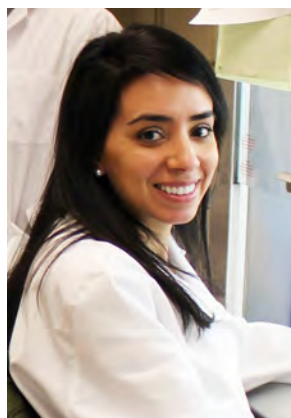
29th Annual Whiteman Awards

Graduate students Andrea English and Belinda Gomez tied for first place for presentation of their research in the 29th Whiteman Competition on February 19th, 2015, which was held in association with the Annual Research Symposium. Both students received \$1,000 as part of the reward. The Whiteman Award was established by Dr. Joe V. Whiteman at the time of his retirement and is presented to graduate students in the Department of Animal Science for outstanding oral presentations of a scientific paper.

Andrea English recently graduate with her M.S. in food science. Belinda Gomez is pursuing her Ph.D. in animal science with a focus on physiology. Recent Ph.D. graduate Justin Buchanan won second place for his presentation and received \$750.



Andrea English



Belinda Gomez

Graduate Student Travel Scholarships

Oklahoma State animal science graduate students Kimberly Branham and Kristi Allwardt recently received travel scholarships.

Kimberly Branham was awarded the Joseph P. Fontenot Student Travel Scholarship by the American Society of Animal Science in July of 2015. The scholarship will pay for her travel to the Southern Section ASAS Scientific Meeting and the National Annual ASAS Scientific Meeting.

Kim recently graduated with a M.S. in animal science with a focus in behavioral genetics. She was advised by Drs. Megan Rolf and Michelle Calvo-Lorenzo.

Kristi Allwardt was awarded a travel scholarship at the 2015 Applied Reproductive Strategies in Beef Cattle (ARSBC) Meeting, which was held in Davis, California August 17th - 18th. The monetary award will support her travel to the Southern Section and National Annual ASAS Scientific Meetings.

Kristi is working towards a M.S. in animal science with a focus in genetics and is advised by Dr. Megan Rolf.



Kristi Allwardt



Kimberly Branham

ADSA Graduate Student Competition

Cheyenne Robinson competed in the American Dairy Science Association (ADSA) graduate student oral talk competition at ADSA's annual meeting in Orlando, Florida in July of 2015. Her presentation was entitled "Regulation of microRNA-221 in ovarian theca cells of cattle: a possible role in follicular development."

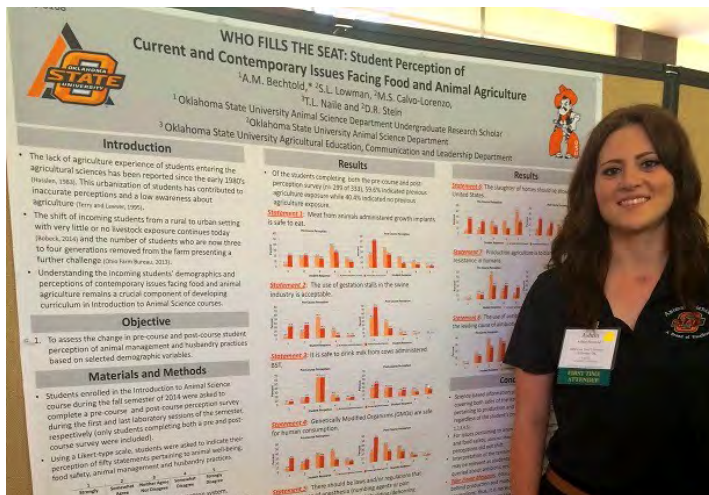
Cheyenne Robinson recently graduated with an M.S. in animal science with a focus in physiology and was advised by Dr. Leon Spicer. She will be pursuing a Ph.D. in reproductive physiology at the New Mexico State University Department of Animal and Range Sciences. She is pictured on page 23.

Bechtold and Lowman Receive First Place at NACTA

Ashtin Bechtold and Samantha Lowman had the first place poster at the recent North American Colleges and Teachers of Agriculture (NACTA) conference, held June 16th - 19th, 2015 at the University of Georgia, Athens.

There were 141 posters presented at the conference this year. Their abstract was titled, "WHO FILLS THE SEAT: Student perception of current and contemporary issues facing food and animal agriculture." Ashtin, originally from Vacaville, CA, is an Animal Science Undergraduate Research Scholar and will be a senior pursuing a degree in Animal Science/Agriculture Communications.

Samantha just completed her M.S. degree under Dr. Dan Stein. Samantha is from Lincoln, IL. Samantha also presented her abstract as an oral presentation. Her abstract was titled, "WHO FILLS THE SEAT: the demographics, perceptions, and knowledge base of students enrolled in the Introduction to Animal Science course at Oklahoma State University." Samantha was also a recipient of the NACTA Graduate Student Teaching Award, which was presented at the NACTA awards banquet.



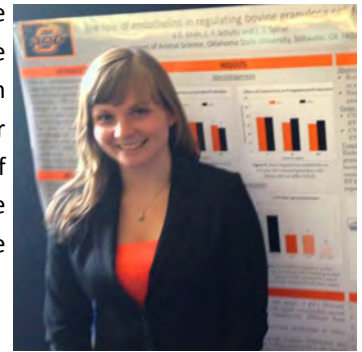
Ashtin Bechtold



Samantha Lowman

Ervin Presents Poster at OSU Research Symposium

Undergraduate student Jackie Ervin presented a poster at the OSU Undergraduate Research Symposium in April of 2015. Her poster was entitled, "The role of endothelins in regulating bovine granulosa cell function." Jackie is mentored by Dr. Leon Spicer.

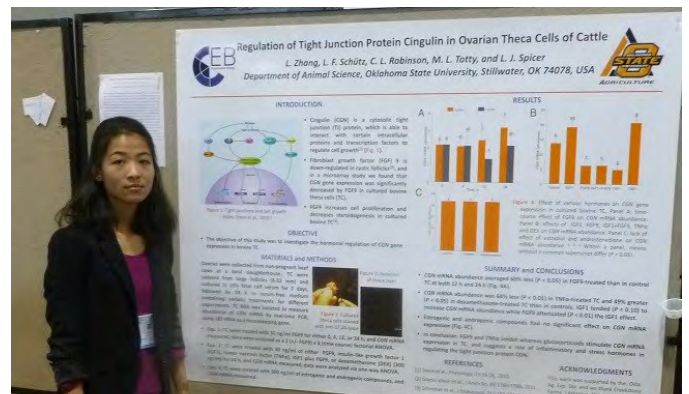


Students Present Posters at 2015 Experimental Biology Annual Meeting

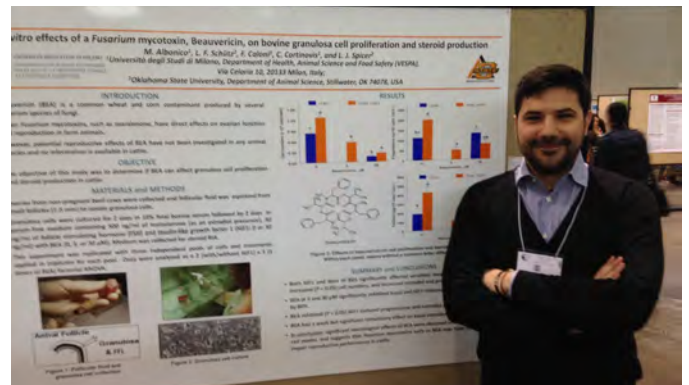
Lingna Zhang and Marco Albonico presented posters at the 2015 Experimental Biology annual meeting in Boston, MA March 28th - April 1st, 2015.

Lingna is a M.S. student under the direction of Dr. Leon Spicer. Lingna's poster was entitled "Regulation of tight junction protein cingulin on ovarian theca cells of cattle."

Marco is a visiting scholar in Dr. Spicer's laboratory from the University of Milan. Marco's poster was entitled "In vitro effects of Fusarium mycotoxin, Beauvericin, on bovine granulosa cell proliferation and steroid production."



Lingna Zhang



Marco Albonico

Meat Science Students Compete at RMC

Meat science faculty and students attended the American Meat Science Association's 69th Reciprocal Meat Conference (RMC) in Lincoln, NE. The students presented ten abstracts as posters, as well as participated in the iron chef and quiz bowl competitions. Graduate student Andrea English was selected to present her abstract in the oral session.

Meat science student Kendra Wills of Enid, OK, placed second in the RMC Undergraduate Research Poster Competition. Kendra's abstract was titled, "Use of RedoxSys to measure oxidation reduction potential in beef." Kendra will begin her M.S. in Food Science with a focus in Meat Science in August. She is being advised by Dr. Ranjith Ramanathan.



OSU Animal Science Wins Institutional Award at Western Section Meeting

Three students from the Department of Animal Science represented OSU at the 87th Annual Meeting of the Western Section of the American Society of Animal Science held in Ruidoso, NM from June 23-26, 2015. Belinda Gomez, a Ph.D. student, and Jessica Chase, a MS student, gave an oral presentation of their scientific work in the graduate student paper competition. Julia Matera presented her research in the undergraduate poster competition. All three students were honored for their presentations at the Awards Banquet.

Julia Matera, mentored by Dr. Craig Gifford, won first place in the Undergraduate Poster Competition with her presentation of "Serum proteins protect against histone toxicity and inhibition of toll-like receptor signaling increases histone cytotoxicity in cattle."

Jessica Chase, mentored by Dr. Craig Gifford, was awarded fourth place in the Graduate Student Presentation Competition with her talk titled, "Intrauterine transfer of autologous interferon tau-primed peripheral blood mononuclear cells increases pregnancy rates after embryo transfer in cattle."

Belinda Gomez, mentored by Dr. Jennifer Hernandez Gifford, was awarded second place in the Graduate Student Presentation Competition with her talk titled, "IGF-1 attenuates WNT inhibition on FSH target genes and estradiol production in granulosa cells."

A top honor at the Western Section meeting is the presentation of the Institutional Award. All institutions at the meeting are eligible to compete and the award is presented to the institution whose students earn the highest scores in the research presentations. Because of these student's excellent research presentations, Oklahoma State University, Department of Animal Science, was also awarded the Institutional Award and will host the traveling trophy for the next year. This is the first time ever for this accomplishment for the OSU Department of Animal Sciences.



Jennifer Hernandez Gifford, Belinda Gomez, Julia Matera, and Craig Gifford (Jessica Chase not shown).



Julia Matera received first place for her UG Research Poster.

Belinda Gomez (left) received second place for her oral presentation & accepted the Institutional Award for OSU.

Pushpinder Litt Receives Developing Scientist Award

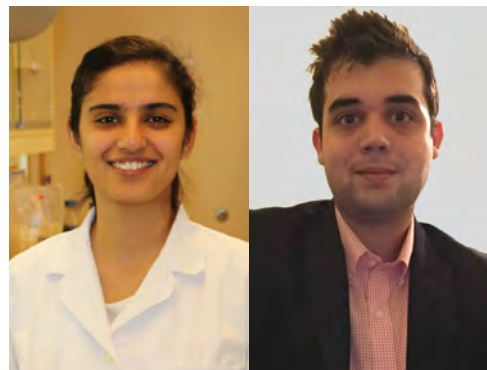
Graduate students Pushpinder Litt and Justin Brooks attended the International Association for Food Protection annual meeting July 25th to 28th in Portland, Oregon to present their research in the Developing Scientist Award Competition. The IAFP meeting was attended by over 3000 food safety experts from academia, government and industry from around the world.

For the Developing Scientist Award, IAFP-2015 selected ten finalist in all and the award was presented to the top three presenters. Pushpinder and Justin were among several hundred students competing for the Developing Young Scientist Award and were both chosen as finalists.

Pushpinder gave an oral presentation on her abstract, titled "Inhibition of biofilm-forming shiga-toxigenic Escherichia coli using bacteriophages isolated from beef cattle environment" at the meeting. She is pursuing her Ph.D. in Food Science.

Justin gave a poster presentation on his abstract, titled "Evaluating the re-usability of organic sanitizers in reducing Escherichia coli O157:H7 on organic leafy greens." He is pursuing his M.S. in Food Science with a focus on Food Microbiology.

Pushpinder was selected as one of the top three presenters for the Developing Scientist Award and received 2nd place for her oral presentation, which came with a \$1,000 reward. Both students are mentored by Dr. Divya Jaroni.



Pushpinder Litt

Justin Brooks



Announcements

2015 Eng Symposium

This year's symposium, titled "Innovations in Intensive Beef Cow Production, Care and Management," will be held at the Skirvin Hotel in Oklahoma City, OK on September 17th -18th, 2015. Attendees will include researchers, students and cattle producers alike.

To register for this year's symposium or to learn more, visit the event's web address at <http://www.mcdonaldengsymposium.org/>. For more information, call the Eng Foundation at (575) 743-6331 or Oklahoma State University at (405) 744-6060.

2016 ASAA Gala Reunion Honorees

The Animal Science Alumni Association will honor Dr. Mark Johnson and his Livestock Judging Teams, as well as the 1966 Meat and Livestock Judging Teams. The Gala will be held on April 1st, 2016.

2017 ASAA Gala Reunion Honorees

The Animal Science Alumni Association will honor ALL National Champion Judging Teams (Livestock, Meat, Horse, Meat Animal Evaluation). The Gala will be held on March 31st, 2017.

ASAA Needs Your E-mail Address

The Animal Science Alumni Association is currently seeking e-mail addresses for Animal Science Alumni. If you are an OSU Animal Science Alumni, please e-mail your information to Kim Brock at kim.brock@okstate.edu.

ASAA

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Thank you for taking the time to read the Oklahoma State University Department of Animal Science newsletter, Cowpoke News! I hope you have enjoyed reading about the students, staff, and faculty.

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Stillwater, OK 74078

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Interested in Oklahoma State University? Come visit our campus! Our university offers tours Monday through Saturday. You can choose from the following:

Group Campus Tours

Group campus tours are available to students in grades 9-12. You must have a least 10 students for the group tour.

Self-Guided Tours

Unable to attend a scheduled tour? Choose a self-guided option that you can complete at your convenience.

Alumni Tours

Tours for alumni are offered each Friday at 2p.m. by the OSU Alumni Association. You must preregister to attend.

View all tour options at <https://admissions.okstate.edu/visit>.

How To Apply

Want to be an OSU Cowboy? To apply, please go to <https://admissions.okstate.edu/apply>.

Oklahoma State University Department of Animal Science

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OSU Alma Mater

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Bright Shines Your Name
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We Herald Your Fame
Ever You'll Find Us
Loyal and True
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