

ANIMAL SCIENCES

Spring 2013

The Inside Scoop



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ANIMAL SCIENCES:

Moving Forward



Dr. Margaret E. Benson

Professor and Chair,
Department of
Animal Sciences

~GO COUGS!

The Department of Animal Sciences at Washington State University has experienced changes over the last few years in response to many factors influencing the how and what we deliver in all of our Teaching, Research and Extension programs. While part of these changes are a direct response to economic challenges faced at the local, state, and national levels, we have also been responsive to changes in the industries we serve, in the needs of our student body in preparing them for diverse careers, and in developing new teams and partnerships required to solve complex research problems. We have responded to the challenges, taken advantage of opportunities, and strengthened our position for ensuring current and future success. We have had an eventful and outstanding year and I hope you enjoy learning a bit more about some of our accomplishments in the pages that follow.

Research successes in 2012 were many. Animal Sciences faculty received grant awards from all of the major federal competitive grant funding agencies—USDA-NIFA (National Institute Food and Agriculture); NIH—(National Institute of Health); and NSF (National Science Foundation), and support from various allied industries were received as well. These awards are essential for our researchers to apply their research expertise in helping solve the complex problems facing our livestock industries and societal needs. Some of the areas in which Animal Sciences faculty received grant awards included: animal health, fertility and reproductive capacity, growth and muscle development, environmental sustainability, feed efficiency, and nutrient utilization. The success of our faculty in receiving these awards, both individually and as members of multidisciplinary teams, documents their stature among peers in highly competitive environments and the value of their science to industry, national and international stakeholders. The impact of these research contributions will be many, some having immediate application to

our industries and society and others laying the foundation for novel applications in the future.

As always, our students—both undergraduates and graduate students—are the heart of the department and their abilities and accomplishments not only make us proud but remind us that the future will be in bright and talented hands. Our enrollment continues to lead the college in the production agriculture majors. But, we not only have a large number of students, we also have students that upon completion of their degrees are in demand by very diverse employers. Taking seriously the charge to be well prepared, career-ready graduates, our students continue to secure impressive positions post-graduation or secure admission into veterinary or graduate programs to further their education. We also realize the challenges our students face with rising tuition and costs of a college education. This reality has changed the undergraduate experience in that many students now pursue their degree while working part time or even more to help pay for their degree. In response to this, our programs, club activities and student experiences continue to evolve to meet their needs. The scholarship program within the department has helped many students reach their goals of a college degree and we have many of you to thank for your support of these students.

It is our pleasure to provide our supporters, alumni and friends with the “Inside Scoop” on what is happening in the Department of Animal Sciences. Your support and interest in what we are doing is valued and appreciated. The Department of Animal Sciences is proud of our accomplishments and the contributions our faculty, staff and students make. On the pages that follow we hope you enjoy a glimpse of just a few of these happenings. 2012 was an exciting year, we are off to a great start in 2013 and on behalf of the entire department, I thank you for your interest and support.

ANIMAL SCIENCES

The Inside Scoop

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Cover: Undergraduate Emily Burton listens to a cow's digestive system.



“I had no idea that WSU had access to so many amazing animal facilities, and it was really cool to be able to tour most of them.”

Meghan Nyquist
freshman



Where Animal Sciences Begins

ANIMAL SCIENCES 101 (AS 101)

Introduction to Animal Sciences

(AS 101) is the foundation upon which all classes in Animal Sciences are built. All incoming freshmen and most transfer students must take this course if they want to major in Animal Sciences. The department strives to make AS 101 as comprehensive as possible. It is designed to help students learn how animal science is grounded in the sciences of chemistry and biology. Students learn how animal production systems operate in the United States and why certain management practices are used. Undergraduates are expected to apply their general science knowledge to the management of animal production systems. They also learn how animal science is advancing knowledge in other scientific disciplines and how it relates to our society.

Learning what animal science encompasses is eye-opening for a lot of students. In fact, Jessica Sears, a sophomore from Olympia who had been thinking of leaving WSU said, “I decided to take the class to see if I even liked the animal science program here, since my background is mostly in small animals and horses, and not livestock. I wasn’t sure if I would like the livestock part of the class, but as it turned out I loved it! I really liked that this class gave me a well-rounded overview of different career paths in animal industries. Production, management, research, teaching, health care, and other aspects were touched on for large and small animals. I loved this class so much that I have decided to stay at WSU and switch my major to pre-vet/animal science.”

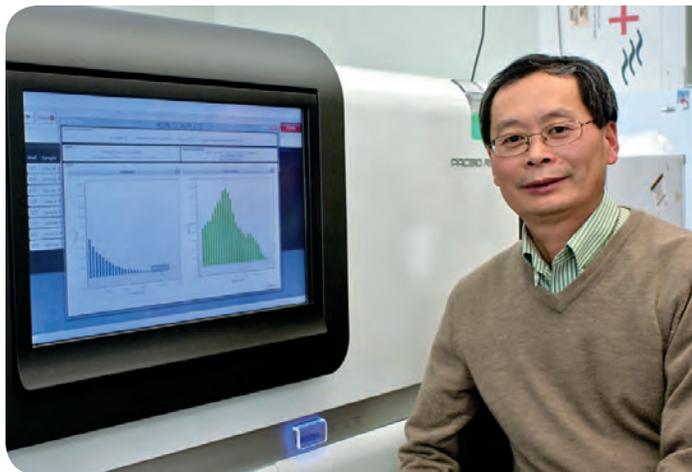
Traditional classroom lectures and weekly, hands-on laboratory sessions provide the structure for AS 101. Whenever possible, labs are carried out at animal centers so students can see first-hand how animal production systems work. Running and coordinating this class takes a concerted effort by many faculty members, staff, and graduate students in the department. But students appreci-

ate being taught about subjects by the faculty who are experts in their fields. When asked to share her thoughts about the structure of AS 101, Victoria Benson, a freshman Animal Sciences student from Montesano, Washington, said, “I really liked the way the class was set up. Having a different speaker for almost every lecture and constantly covering new topics helped create a diverse and well-rounded accumulation of knowledge. My favorite part was being able to do interactive and proactive activities.”

Record numbers of incoming freshman have made the completion of AS 101 even more challenging, especially when there are 219 students to transport to labs at animal centers located off campus. In fact, the department had to resort to hiring bus transport this year to get all of the students out to animal centers and back to campus.

Labs are set up so students can get hands-on experience, and they are encouraged to actively participate. In the animal production labs, students watch live demonstrations showing how to move livestock safely and without stress, and are then given the opportunity to try doing it themselves. They might also learn how to check for vital signs or how to give injections. In other labs, students examine digestive and reproductive tracts, which allow them to see and feel anatomical parts that were previously discussed in lectures.

Students appreciate this practical, experiential approach and particularly enjoy going to the animal centers. “I felt [AS 101] was very hands-on, and I learned so much that I didn’t realize I was going to learn my very first semester at WSU, said Meghan Nyquist, a freshman Animal Sciences student from Bellevue. “My favorite part was the variety of labs we got to go to. I had no idea that WSU had access to so many amazing animal facilities, and it was really cool to be able to tour most of them.”



DECIPHERING ANIMAL GENOMES

with Zhihua Jiang



Dr. Zhihua Jiang is an expert in animal genetics and genomics. He earned his B.S. in Animal Sciences at Nanjing Agricultural University in China and his Ph.D. in Quantitative Genetics/Animal Breeding and Biotechnology at the University of Zagreb in Croatia. After serving as a faculty member for 12 years at Nanjing Agricultural University, Jiang decided to expand his experience around the world and spent time at the Roslin Institute in Scotland, the University of Rennes in France, and the University of Guelph in Ontario, Canada, before ultimately relocating to Pullman and joining the WSU Department of Animal Sciences in 2002.

Over the years, his interest in animal genetics expanded to the study of comparative genomics, that is, research in which the genome sequences of different species are compared. Using a reference genome, such as the human genome, Dr. Jiang can identify regions in the genomes of other species that are similar or different. This information helps Jiang understand the structure and function of specific genes in various species. He can then use this information to develop strategies for selection of animals with superior production traits such as growth or milk production or even resistance to diseases. In addition, Dr. Jiang uses comparative genomics to study the evolutionary changes among species. He can then identify genes that are conserved, or common, among species, and those genes that make a species unique.

Dr. Jiang believes that “genomics research and application promise to significantly benefit the livestock industry by providing knowledge and technologies that can optimize production, quality, nutritional value, and resistance to diseases.” Because of his belief and also because of his inherent interest in comparative genomics, on any given day Jiang may be researching the genomes of frogs, beef cattle, dairy cattle, water buffalo, sheep, or pigs. For example, Dr. Jiang has taken genome information from cattle, a well-studied species, and used it to explore the genome of water buffalo, a little-studied species that is economically valuable

in many Asian countries. The two species are closely related, but genome sequence information for the water buffalo is lacking. So, with support from an international agency, Jiang sequenced the entire water buffalo genome. Genetic information will become clearer once the genome assembly is complete. In Asia, the water buffalo is a source of meat, milk, fertilizer, fuel, and draft power. Compared to cattle, water buffalo are less susceptible to external pests, can utilize lower quality forages, and produce milk with greater amounts of fat, but they tend to produce less milk and tougher meat. Information gleaned from the water buffalo genome may lead to discovery of genes or molecular markers that will help improve feed efficiency and disease resistance in cattle and, conversely, genome information from cattle may help improve overall milk production and meat tenderness in water buffalo.

Dr. Jiang also uses information from the human genome to advance his work with animals because the human genome can provide a blueprint for the understanding of gene structure and function in other mammals such as farm animals. For example, Jiang uses information about genes associated with obesity in humans to explore meat quality traits in beef cattle. Using information from the human genome, Dr. Jiang found genetic markers in cattle that were linked to marbling, backfat thickness, and meat tenderness. Several of these genetic markers have been patented and are used in a DNA profiling test owned and conducted by a major DNA testing company to help beef cattle producers make informed breeding decisions to improve meat quality in their cattle. Dr. Jiang also uses the human genome to identify genetic markers important for milk production, fertility, and reproduction in dairy cattle as well as disease resistance in pigs.

The future of genome sciences is bright and Jiang knows that contributions from his research and others in his field bring precision breeding systems that meet the specific needs of livestock industries closer to reality.

Enhancing the Undergraduate Education Experience

NEW STAFF MEMBERS OFFER NEW OPPORTUNITIES

ACADEMIC COORDINATOR



Valorie Fisher

The Department of Animal Sciences welcomed Valorie Fisher to the department in March 2012 as our new Academic Coordinator. With record numbers of undergraduate advisees in our department, the academic coordinator is critical for providing our students the best experience and most complete preparation for the future possible.

As our academic coordinator, Fisher is instrumental in recruiting, advising, and assisting students throughout all phases of their undergraduate academic career. Students beginning their studies in Animal Sciences meet with Fisher to talk about class scheduling,

goals, and expectations. Her welcoming demeanor and positive energy put students at ease and her experience helps students plan their academic careers. With hundreds of students in the animal sciences pipeline on their way to Bachelor of Science degrees, making sure our students get directed to the faculty that can best provide them career and scholarly advice, experiences, and contacts is an essential part of Fisher's contributions.

Before coming to Animal Sciences, Fisher advised Pre-Vet, Pre-Health, Physical Therapy, and Physician Assistant students in the WSU College of Arts and Sciences. Fisher has

more than 25 years of advising experience and was the winner of the 2011–2012 WSU ACA-DA Outstanding Achievement in Academic Advising Award.

Her dedication to advising students was also recognized at the national level where she was presented the NACADA Outstanding Award Certificate of Merit in Primary Advising at the NACADA Conference in Nashville last year. Fisher is well connected to services and resources and offers Animal Sciences undergraduate students a consistent approach to advising. When away from WSU, she enjoys downhill skiing, reading, and playing with her Australian Cattle dog.

Thanks to a generous gift from the Murbach Estate, the Department of Animal Sciences has the opportunity to address a topic of great interest to many of our students: equine management. Therefore, we are pleased to welcome Angela Reitmeier, an equine instructor who will develop and teach courses in equine production and management and help students find internships in the equine area.

Angela Reitmeier has been a lifelong student of the horse. She grew up riding around and enjoying the North Dakota countryside and showing in Western and English Pleasure.

Reitmeier earned an associate's degree in horse management at the University of Min-

nesota in Crookston. While at UMC, Angela rode and experienced many different breeds of horses. She later came to WSU where she took classes in Animal Sciences and then moved to California for an internship with a dressage trainer.

In 1998, Angie teamed up with her partner, Bill Basham, to start a training facility they called Full Circle Ranch, near Potlatch, Idaho. Since then, Angie has trained and taught many horses and their owners.

In addition to training, Reitmeier gives riding lessons at her barn and other facilities in the area. Angie is also an accomplished clinician and travels around the Northwest conducting training and riding classes.

Angie is excited to be a part of WSU Animal Sciences and wants to focus on students who have little to no horse experience and teach them basic horse handling skills. Angie said, "My goal is to make students more comfortable around horses." She expects to teach basic equine anatomy, husbandry, housing, nutrition, and health care in 100- and 200-level courses. For students who have horse experience and want to further their education and riding abilities, Angie will be using her contacts in the Washington equine industry to organize a variety of internships. Angie has daily office hours and encourages any student who has an interest in horses to stop by her office and introduce themselves.

EQUINE STUDIES INSTRUCTOR



Angela Reitmeier



WSU Beef Cattle

FROM BIRTH TO TABLE

Tom Cummings, Cattle Operations Manager, and Roger Collins, Assistant Herds Manager are the key personnel responsible for efficient operation of the Department of Animal Sciences' beef cattle facilities—the Ensminger Beef Center, located just a few miles outside of Pullman, and the on-campus Cattle Feeding Lab. While the Beef Center is a working cow-calf operation, it is heavily integrated into the Animal Sciences curriculum and is actively involved in research studies. On any given day, one might see Roger helping collect samples for a research project while Tom is leading a tour for a local 4-H club or teaching undergraduate students about cow-calf management practices.

As managers, Tom and Roger's goal is to run the Beef Center so it is financially self-sufficient and produces enough cattle to support teaching, research, and extension activities. To accomplish this, the men work together to manage about 150 Angus, Wagyu, and Angus-sired crossbred cows. There are also 20–25 replacement heifers and two clean-up bulls at the facility.

Breeding season at the Beef Center starts in late spring and both men use artificial insemination (AI) to breed heifers and cows. To improve conception rate, the cow herd is turned out with a clean-up bull for approximately 45 days after breeding with AI. Calving season starts at the end of February and runs through mid-May.

Cattle spend the majority of their time out on pasture. In early spring they are transported down to about 1200 acres of grazing land near the Snake River where they stay until grass is plentiful back at the 300-acre pasture surrounding the Beef Center. They are moved back to the river pasture in late fall/early winter and return to the Beef Center in mid-January where they are fed in the barns in preparation for calving.

Calves are weaned when they are roughly 205 days old. Some calves are halter-trained and gentled by members of Block and Bridle and sold as club calves at the end of October. A small group of Wagyu and Angus bulls are sold as breeding stock. Crossbred calves not retained for replacements are sold to feedlot operations in the state. This year, some of the Beef Center's calves are being fed by the undergraduate student cooperative, Cougar Cattle Feeders. Angus and Wagyu calves that aren't designated as replacement animals are fed for WSU Premium Beef (see next page). These cattle are backgrounded for about 90 days at the Beef Center and then moved to the Cattle Feeding Lab to finish on a grain/forage-based diet. The cattle are managed so they gain between 2 and 3 pounds a day. Cattle for WSU Premium Beef are fed a minimum of 210 days and are then harvested at the USDA-inspected WSU Meat Sciences Laboratory.

Meet the Men Who Run the WSU Beef Cattle Facilities



Tom Cummings
BS, 1997, Animal Sciences
WSU Cattle Operations
Manager



Roger Collins
WSU Assistant Herds
Manager

Who Knew that Horses Have Opinions About Research?



When Dr. Kristen Brennan goes to career panels at nearby universities, she frequently tells students to “keep your mind open” and experience as much as you can while you are in school because you never know what might aid you in your future career. Kristen graduated in 2008 from WSU with a PhD in Animal Sciences and firmly believes in her own advice because that’s what she did.

“My education in Animal Sciences at WSU set me up for what I am doing now,” Brennan said. “My PhD research taught me a lot and a side research project with the grizzly bears was fun, too!”

While at WSU, Brennan studied under the tutelage of Dr. Kris Johnson, researching how antioxidant genes responded to weight loss in beef cattle. Body fat is broken down for energy when cattle are not eating enough to meet requirements and so lose weight. By-products of fat mobilization can harm cells; however, Brennan found that these by-products also stimulate antioxidant genes to “turn on” and produce proteins that protect cells from damage.

After graduating from WSU, Brennan’s educational credentials helped her get a post-doctoral position at Alltech, Inc. in Nicholasville, KY. After finishing her post-doc, Dr. Brennan was permanently hired by Alltech and she is now a Senior Research Scientist and is the project leader for Animal Nutrigenomics and Equine Nutrition. She is

also an adjunct assistant professor in the Department of Food and Animal Sciences at the University of Kentucky.

Brennan has always been involved with horses and loves living in “horse country” and working with them every day. However, she quickly learned that “horses have opinions” about research and aren’t as easy to work with as cattle!

Brennan has conducted research studies to determine what happens in a horse’s small intestine following an acute starch overload, which might occur following a horse’s overconsumption of oats or other grains. A horse that has eaten a large amount of grain may then experience an episode of laminitis, a painful swelling in the sensitive tissues of the hoof. Part of Brennan’s research is focused on finding ways to mitigate the negative changes that occur in the small intestine after an acute starch overload that ultimately lead to laminitis and other metabolic problems. Her research in nutrigenomics helps to answer how and why changes in nutrition turn genes on or off. In particular, Brennan has found that different diets fed to recently hatched chicks influenced expression of genes in chickens throughout their lifecycles. In other words, genes can be “programmed” by altering diets early in life.

While Dr. Brennan’s research often requires her to travel to Europe or other places around the world, she still finds time to enjoy riding and showing her horse.

WSU PREMIUM BEEF



The WSU Beef Team thought that there might be demand for high-quality, locally produced beef. They took their idea to the Animal Science Students of Entrepreneurship, a small group of WSU students who are learning advertising and marketing skills, who helped them develop a marketing plan for a custom brand of beef. Students designed and presented a business plan and logo—and WSU Premium Beef became reality.

High-quality beef is available from Angus and Wagyu cattle that are bred, born, and fed at WSU beef cattle facilities. WSU Premium Beef is naturally raised with no added hormones or implants, is locally grown, and of premium quality—exhibiting superior marbling, tenderness, and flavor.

Beef is available in 25- to 30-pound boxes and is also available in quarters and halves upon request. To experience mouth-watering steaks, roasts, and hamburger, contact Tom Cummings at 509-335-3777 or tmcummings@wsu.edu for more information.

ANIMAL SCIENCES STUDENT CLUBS



Block and Bridle is an organization of students from multiple majors interested in some aspect of animal agriculture. The club provides opportunities for members to expand their knowledge of agriculture through hands-on experience, tours, events, and guest speakers. Some of Block and Bridle's activities this year included sending members to Nashville for the National Block and Bridle Convention, attending and assisting with the Evergreen Exclusive Sale in Pasco, touring many agriculture facilities, and helping fund club activities by processing and selling Cougar Smokies and Easter Hams.



Dairy Club is a group of students enthusiastic about dairy foods, dairy animals and the dairy industry! Each weekly meeting is full of excitement, information and, of course, cookies and milk. We attend dairy industry conferences throughout the year, such as the Washington State Dairy Industry Meeting and for the Western Regional and National American Dairy Science Association (ADSA). Dairy Club hosts the annual Dairy Olympics, where everyone (including you!) is invited to complete fun tasks at the Knott Dairy Center, such as leading a calf and milking a cow. We invite students ages 8–18 to learn about dairy foods, animals and industry at the annual Cougar Youth Weekend where participants learn to fit and show or judge dairy animals. Overall, Dairy Club is simply legen-DAIRY!



Members of **Collegiate Horsemen's Association** are interested in all things horse-related. We welcome and encourage anyone to join our the club, regardless of horse experience. We have scheduled professionals in many areas of the horse industry, including an equine dentist, a farrier, and an equine veterinary resident to come talk to us about their jobs. We are planning to visit some horse operations in the area where we can see some world-class cutting and reining horses and meet their trainers. In the future, the club would like to sponsor a poker ride or a "horse fun" day for area youth. For more information about CHA, look for our Facebook page or send us an email at wsucollegiatehorsemens@yahoo.com.



Student organizations and clubs are an important part of the college experience. Involvement in clubs help students meet other students with similar interests. Shared experiences can lead to lifelong memories and friendships. Joining clubs or other organizations can also enhance formal classroom educations when students apply what they have learned in classrooms to real-life situations.

Students in Animal Sciences may also be involved in: Companion Animal Club, Organization of Future Veterinarians, and Rodeo Club.

ANIMAL SCIENCES STUDENT COOPERATIVES

Each year students are selected for participation in the award-winning **Cooperative University Dairy Students (CUDS)** program. Students manage a working dairy herd of registered Holstein cows and an equal number of replacements. All members work together as a group to make decisions regarding all phases of management in their herd. CUDS members are exposed to formulating and executing management decisions as well as performing the day-to-day duties of milking, feeding, record keeping, barn maintenance, heat detection, and artificial insemination. CUDS provides an excellent experience for its members to take into their prospective careers.



Cougar Cattle Feeders is a student cooperative with the mission of teaching our members the skills needed in today's cattle feeding industry. This year we have 34 animals in our feedlot where students develop and formulate diets, carry out the daily care and feeding of the cattle, and will eventually gather the harvest data and market the beef. Members also take industry tours, go out on job-shadowing trips, and provide scholarships to CAHNRS students each spring. We have five members this year and are looking for more, so please contact one of our members or email us at ccf.ansci@wsu.edu for more information.



Student Swine Cooperative (SSC) manages their own herd of sows, gilts, and market hogs at the WSU Swine Center. Members actively acquire skills in all aspects of swine production, which includes the daily feeding, care, breeding, and marketing of their animals. SSC has participated in several fairs and events, including the Palouse Empire Fair, Latah County Fair, Swine Information Day in Moses Lake, show pig auctions, and more. Members provide leadership and education to local 4-H and FFA youth, and look forward to continuing to make a positive impact on the community by hosting their third annual Youth Education Day at the WSU Swine Center this spring.



CUDS members pose by display

2012 Cooperative Banquet & Trade Show

Members of the Cooperative University Dairy Students, Cougar Cattle Feeders, and Student Swine Cooperative hosted a banquet and trade show last spring. At the event, members of each cooperative presented their management and herd health plans, and presented data that showed how their animals performed during the time preceding the banquet. Visitors could also visit with members individually and peruse booths set up by vendors. At the conclusion of the event, everyone was treated to barbecued pork with all the fixings and Ferdinand's ice cream!



Cougar Cattle Feeders present their data



Main course—barbecued pork—YUM!



SSC members talk about their co-op

Graduate Students

The Future of Animal Sciences

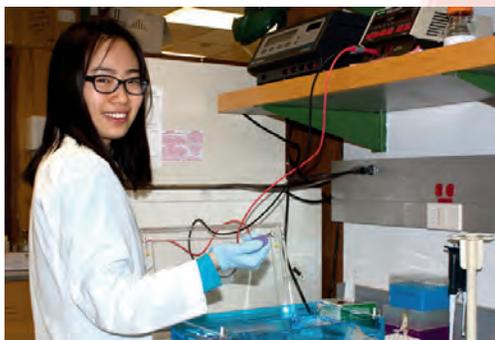
Karalyn Aronow is investigating how the individual personality and stress reactivity of animals from different taxonomic groups affect their interactions with humans. She plans to apply this information to environmental enrichment for animals kept in zoos by elucidating the value of interactions with people as a component of the enrichment program. (PhD; Newberry)

Kelsey Brooks is working in the area of cellular and molecular aspects of conceptus-maternal interactions during early pregnancy in ruminants. Specifically, her work will help to understand the biological role of conceptus-derived factors (cortisol, prostaglandins and interferon tau) in conceptus elongation, which is the period that most conceptuses are lost during pregnancy in ruminants. (PhD; Spencer)

Greg Burns is working in the area of conceptus-maternal interactions during early pregnancy in ruminants. Specifically, he is discovering and understanding the biological role of exosomes from the conceptus and endometrium of the uterus and how they facilitate communication between the conceptus and uterus during the elongation phase of pregnancy. (PhD; Spencer)

Ashley Conway is investigating methods by which beef cow-calf producers can more effectively use low quality forages. (MS; Johnson)

Bo Ding is interested in molecular mechanisms of autophagy involved in immunity and inflammation, and examining critical genes associated with genetic resistance to porcine reproductive and respiratory syndrome virus infection. (PhD; Jiang)



Bo Ding analyzing DNA with gel electrophoresis

Piotr Dorniak is determining how factors from the ovary and conceptus (embryo and associated placenta) regulate function of the endometrium of the uterus that supports growth and development of the conceptus during early pregnancy, using sheep as a model. The research is being conducted to help solve early embryo losses in ruminants. (PhD; Spencer)

Ben Enger is researching practical diagnostics of mycoplasma mastitis. *Mycoplasma* sp. are fastidious pathogens and require special culture conditions, such as elevated atmospheric carbon dioxide levels, enriched media that are specific to mollicutes, and prolonged incubation. Ben will be examining the effects of various levels of atmospheric carbon dioxide on growth of *Mycoplasma* sp. that cause mastitis during standard growth conditions. (MS; Fox)

Lindsay Ellsworth is evaluating the effects of human-animal interactions on adolescents in a residential treatment program. (PhD; Newberry)

Leticia Fanucchi is studying the behavior and physiological response of adult companion dogs to grief. (PhD; Newberry)

Justyna Filant is discovering the cellular and molecular pathways regulating differentiation, development, and function of endometrial glands in the uterus, using mice as a model. The endometrial glands of the uterus are essential for successful pregnancy, and animals that lack endometrial glands are infertile and exhibit recurrent early pregnancy loss. (PhD; Spencer)

Xing Fu is researching the role of ephrins (proteins) in mediating muscle cell/adipocyte interactions, and their impact on intramuscular adipogenesis. (PhD; Du)

Chris Gambino is continuing his work on characterizing greenhouse gas and ammonia emissions from ruminant production systems in order to develop nitrogen estimation models that will identify critical control points for mitigation strategies. (PhD; Johnson)

John Griner has learned that adipocytes are always embedded in connective tissues. Therefore, connective tissue, or the extracellular matrix, is expected to have a significant impact on adipogenesis. Griner is examining the role of lysyl oxidase, one of the enzymes critical for connective tissue synthesis, in the regulation of adipogenesis. (PhD; Du)

Shaun Harris will use in-vitro cell culture and in-vivo studies to compare the difference in adipogenesis between Angus and Wagyu cattle. He hopes to shed light onto the mechanisms that lead to high marbling in Wagyu cattle. (PhD; Du)

Melissa Jackson has recently demonstrated that blocking myostatin not only increases muscle mass in mice, but also the size of hearts. Fat mass is reduced in these animals suggesting that novel myostatin-blocking technologies, which are currently being developed in Dr. Dan Rodger's lab, could be used to repair damaged hearts and muscle as well as to reduce total fat mass. This work may have implications for human health as well. (PhD; Rodgers)

Heidi Keen is testing a novel assessment for determining the psychological value of environmental enrichment items for animals. (PhD; Newberry)

Rui Li's research focuses on understanding of molecular mechanisms involved in seasonality of infectious diseases in farm animals. (PhD; Jiang)

Guiling Ma's research focuses on both dairy nutrition and management optimization of anaerobic digesters. Her nutrition research will address the effect of potassium carbonate supplementation on rumen biohydrogenation and milk fat production. Her anaerobic digester research will focus on development of the ADOPT model (Anaerobic Digester OPTimization) which allows for simultaneous consideration of nutrient flow and economics. (PhD; Harrison)

Meghan Munter is investigating how alcohol impacts adult stem cell function. Alcohol will damage cellular mitochondria and fully functional mitochondria are important for stem cell differentiation. Based on research demonstrating alcohol treatment damages spermatogonial stem cell function, Meghan's hypothesis is that alcohol-induced mitochondrial damage is a key factor suppressing stem cell function. Research findings from cell culture, stem cell transplantation and electron microscopy will help determine how alcohol damages tissues at the cellular level and may lead to novel therapeutic approaches. (MS; McLean)

Maresh Neupane and **Jennifer Kiser** will be studying Bovine Respiratory Disease (BRD) and will play essential roles in the BRD project. The long-term goal of the BRD project is to reduce the prevalence of BRD in beef and dairy cattle with resultant improvements in animal welfare and industry profitability. They will be involved in research efforts that will include genome wide association analysis of 3,000 dairy and 3,000 beef cattle for BRD, pathogens specific to BRD, and BRD clinical scores. Analysis of gene pathways will also be conducted to identify pathways associated with the disease and genes that modestly affect the susceptibility to disease. (PhD and MS; Neiberger)

Fei (Figo) Sun is focusing on the comparative losses of ammonia and greenhouse gases from land-applied dairy manure, and the effect of anaerobically digested manure on phosphorus uptake by grass. Specifically, Figo will evaluate lagoon-stored manure, reduced-solids lagoon-stored manure, and anaerobically digested low-solids manure. (MS; Harrison)

Bo Wang is studying intramuscular fat accumulation (marbling), focusing on early fat cell development in cattle. Wagyu cattle are well known for their extremely high marbling. Bo will be comparing the difference in the formation of intramuscular fat between Wagyu and Angus cattle, and further exploring the underlying mechanisms responsible for such differences. (PhD; Du)

Robin White is investigating the opportunities for improving the sustainability of the beef industry by using a coupled deterministic environmental and economic model to assess the relative environmental, economic, and social welfare implications of different management practices. She is also seeking to disseminate what she learns from her model to stakeholders within the beef industry via iteratively developed teaching and Extension tools. (PhD; Johnson)

Qiyang Yang is focusing on identifying a few key genes that initiate adipogenesis and is studying epigenetic modifications that lead to the differential expression of these genes between cells undergoing adipogenesis and cells committing to other cell lineages. (PhD; Du)

Kristy Yenick is studying and evaluating testicular cells in mice and the factors that contribute to spermatogonial stem cell fate, leading to a better understanding of adult stem cell maintenance in males. (MS; McLean)



Amanda Patterson is working to delineate regenerative mechanisms in mammalian tissues using the uterus as a model organ. Patterson's efforts have established that epithelial regeneration that occurs as a component of the estrous cycle, as well as following parturition, occurs in part through mesenchymal-to-epithelial transition. (PhD; Pru)

Amanda Patterson accepting her Outstanding Doctoral Student Award at the 2012 Animal Sciences Awards Banquet

Carl Rogers knows that AMP-activated protein kinase (AMPK) inhibits adipogenesis and promotes myogenesis, but the mechanisms are unclear. So, he is studying the role of stress signaling in linking AMPK to adipogenesis and myogenesis. (PhD; Du)

Shannon Shields is developing a dynamic, deterministic, mechanistic bio-mathematical model that explicitly describes genetic, nutritional, and physiological controls in order to improve reproductive processes in dairy cows. (PhD; McNamara)

Quality Feeds

For Future Champions!

Cougar Quality Feeds is an exciting new venture for the Department of Animal Sciences. We routinely formulate and mix the feeds needed for our campus livestock operations at the WSU Animal Sciences Feed Plant and now we have gained approval for and initiated sales to the public. With the ability to formulate and mix feeds in our facilities, we now offer a limited selection of feeds for sale to the public. We expect to expand the feeds available as the process continues.

Growing a champion club calf requires readily available feed that provides proper nutrition. When the recent closure of two major feed mills in Eastern Washington severely decreased the availability of feed in the area, a gap was created that Cougar Quality Feeds could help fill with custom feeds mixed on-site at the WSU Feed Plant. Using high quality ingredients, Cougar

Quality Feeds offers feeds that are competitively priced with commercially available feeds. All feeds have been tested, analyzed

and come with a guaranteed analysis. In particular, Club Calf Finisher for Feedlot Cattle was scientifically designed to maximize a beef calf's genetic potential for growth. Club Calf Finisher contains only high-quality feed ingredients and is fortified with vitamins and minerals. It does not contain by-products or animal proteins. This high-energy, high-protein feed will promote rapid and efficient growth of beef cattle when fed as directed.



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At present, Club Calf Finisher is the only feed that is available from Cougar Quality Feeds. Feed mixes will be available soon for growing and finishing lambs. In the future, feeds formulated for growing or finishing pigs will be available. For more information or to place an order, visit our web site: cougarqualityfeeds.wsu.edu or call Rich Villa at 509-335-8287.

Spending Summer in the “Horse Capital of the World”

L Lauren Nichols, a May 2012 Animal Sciences graduate from Yakima, took advantage of a hands-on learning experience that is available to all students in Animal Sciences—an internship. Lauren’s goal was to expand her limited experience with horses, so she applied and was selected for a competitive internship at the Peterson & Smith Equine Reproduction Center near Ocala, Florida.

Shortly after graduation last spring, Lauren headed to Marion County, Florida, the “Horse Capital of the World.” She found out that she would be living and working with seven other students from different areas of the United States. At six each morning, Lauren would be out in the barns cleaning stalls, feeding and turning horses out to pasture. She learned basic equine management skills, including vaccination and deworming procedures. Most importantly, Lauren was involved in many aspects of assisted equine reproduction and gained valuable experience in artificial insemination (AI) and ultrasound procedures. She also learned how to flush embryos and how to perform embryo transfer (ET) in mares at one of the premier equine reproduction centers in the country. Lauren was pleased to find that she already had a good basic understanding of most of the techniques performed at the center. The knowledge that she gained from Dr. McLean’s Physiology of Reproduction class prepared her for the physiological and technical aspects of equine reproduction while David deAvila’s Artificial Insemination and Pregnancy Detection course prepared her for the practical aspects of equine AI and ET.



Internships enable students to gain experience in areas ranging from zoo animal nutrition to equine management and reproduction. A variety of internship programs are listed on the Animal Sciences website.

<http://www.ansci.wsu.edu/internships/internships.aspx>

Lauren is now back at WSU as a first-year veterinary student. When asked about her educational experience, Lauren stated, “My education from Animal Sciences was exceptional. The classes were both challenging and comprehensive and I graduated with the confidence that I needed to be prepared for a career involving Animal Sciences. My education in Animal Sciences has given me an edge in my knowledge of nutrition, animal handling, and how to solve animal agricultural-related problems.”

Living the Dream...



All the faculty show sincerity in helping students... They go above and beyond to make sure you are on the right track to success.”

~Brian Schoch, 2011 Grad

Can a Bachelor of Science degree in Animal Sciences lead to a career in the animal agriculture industry, even for individuals without prior livestock experience? That’s what Brian Schoch hoped when he came to study animal science at WSU. Schoch had always known that he wanted to be involved in the beef or dairy industry but he didn’t get much experience in either of those fields growing up in Shoreline, Washington, a suburb of Seattle. But, with support from his parents and grandfather, plus a lot of hard work, he is living his dream.

In May 2011, Schoch graduated from WSU with a BS in Animal Sciences and soon thereafter got a job at ABS Global as an artificial insemination (AI) technician. Since then, he’s logged a lot of miles traveling all over Washington and Idaho and has seen lots of cows. He was particularly impressed with the 100,000 heifer lot and the 13,000 cow dairy he worked at in Idaho. Currently, he splits his time

between Eastern and Western Washington breeding cows for a wide variety of clients, ranging from backyard beef producers to dairymen milking 3,000 cows.

Schoch felt that his education in animal science prepared him well for his future. AI and Pregnancy Detection (AS 454), taught by David deAvila, was an influential class, given his career path. However, Schoch credits Ruminant Nutrition (AS 408) as being the one course that really challenged him to think and ask questions. The questions that Dr. Kris Johnson asked in class could not be answered through rote memorization. Dr. Ron Kincaid, Dr. Johnson, and David deAvila were, and continue to be, great mentors for Schoch.

Schoch’s feels his involvement in CUDS, Cougar Cattle Feeders, and Dairy Challenge were fundamental experiences that supplemented his coursework. Living at Knott Dairy Center provided Schoch prac-

tical knowledge that can only be learned by total immersion in the day-to-day operation of a dairy. He said that since he had no livestock experience before coming to WSU, “The CUDS and Cattle Feeders programs gave me the necessary experience to increase my skill base and [gave] me confidence upon graduation.”

When asked what his advice to freshmen would be, Schoch said, “Get involved. The opportunities are endless but you have to take the initiative and not wait for them to come to you. Take every chance to ask questions and go above and beyond just doing the course work.”

Earning a living in in his chosen profession is rewarding to Schoch in numerous ways, but he had some more advice to share with students, “Enjoy every day of your college career. The friendships and experiences you have in these four years will stay with you for a lifetime!”

Noteworthy Items

Brooke VanderVeen was chosen as the Student of the Year for the Western Region of the American Dairy Science Association–Student Affiliate Division (ADSA–SAD).

Anna Gibson took 2nd place in the Production Research speech competition at the National ADSA–SAD at the Joint Annual Meeting in Phoenix in July 2012 and was also elected as ADSA–SAD Secretary/Treasurer for 2012–2013.

Danielle Meyers, Jessica Levy, Anna Gibson, and **Brooke VanderVeen** were members of the Dairy Quiz Bowl Team that took 2nd place overall at the Joint Annual Meeting in Phoenix.

John McNamara received an ADSA Fellow Award for Distinguished Service in dairy production for 20+ years.

Larry Fox was recognized as the ADSA Outstanding Advisor of the Year.

Brooke Compton won the Basic Research Agricultural Sciences section at the CAHNRS Undergraduate Research Poster Fair with her research presentation of work she conducted in Dr. Pru's lab.

Gina Lo and **Erik Walker** placed 2nd in the Applied Research Agricultural Sciences division at the CAHNRS Undergraduate Research Poster Fair with their research done with mentor Dr. Newberry.

Cougar Cattle Feeders won a club award for community and campus engagement and spirit at the CAHNRS Awards Banquet in 2012.

Abigail Olson was selected as the 2012 Aggie of the Year.

Abigail Olson and **Amber Quann** placed on Platinum Teams at the 2012 Western Dairy Challenge in Fresno/Visalia, California.

Lindsay Ellsworth was awarded a Graduate Student Grant from the WSU Alcohol and Drug Abuse Research Program for her research.

Abigail Olson was selected as the 2011–12 Animal Sciences Outstanding Senior.

Elizabeth Cashell and **Amanda Patterson** were recognized as the 2011–12 Animal Sciences Outstanding MS and PhD Graduate Students, respectively.

Ruth Newberry, Derek McLean, and **Jim Pru** were presented with Teaching Awards of Merit from the North American Colleges & Teachers of Agriculture (NACTA).

AWARDS

Excellent Research in Reproductive Biology



Dr. Tom Spencer will receive the Research Award from the Society for the Study of Reproduction (SSR) at the society's 46th annual meeting to be held in Montreal, Canada, in July. The SSR Research Award is an award of the highest honor that recognizes an active, regular member of SSR for outstanding research published during the previous six years. As the recipient of the 2013 SSR Research Award, Dr. Spencer is recognized by his peers as an innovator and scholar. Furthermore, he is known to be a pioneer in the development of novel and significant areas of knowledge. He used creative techniques and independent insight to uncover new knowledge that serves as a foundation to expand current understanding of reproductive biology. Dr. Spencer used new and superior experimental methodologies to test his innovative research hypotheses and designed appropriate experiments that lead to unambiguous conclusions. Moreover, his research results have been communicated to the scientific community through timely presentations at scientific meetings and publication in high-quality journals.

Leading by Example

Dr. Mary Ann Vasbinder, a former Animal Sciences student who graduated with a BS in 1986 was recently awarded the 2012 Women's Leadership Award for Professional and Academic Leadership. CAHNRS established this award to recognize alumnae who have distinguished themselves in academics, career, leadership, and professional service.



Vasbinder previously worked at Bionetics Corporation at NASA's Kennedy Space Center in Houston, Texas where she was involved in biological projects that were headed for space. Vasbinder later earned her DVM (Magna Cum Laude, Florida Veterinary Medical Association Outstanding Senior Award winner) from the University of Florida and is now Acting Director of the U.S. Training Program in the Office of Animal Welfare, Ethics, and Strategy at GlaxoSmithKline.

Dr. Vasbinder has played a key role in developing guidelines for laboratory care and use. The book chapters and journal articles she has published in laboratory animal sciences, research methodology, laws and regulation and standards of care can be applied to any entity that uses animal models in their research. Her contributions have influenced laboratory animal standards in the United States, Europe, and China, and ensure that animal research is accurate, reproducible, and humane.



Happy Animals are Productive Animals

Studying Animal Well-Being with Ruth Newberry



What types of environments or stimuli make an animal “happy”? That is what Dr. Ruth Newberry wants to know. Her research program focuses on the behavior and well-being of a diverse range of animal species, including agricultural, laboratory, and zoo animals, as well as companion animals. She is especially interested in how environmental enrichment, which is the provision of toys or other stimuli, group size and social experiences, and interactions with humans affect an animal’s physical and physiological well-being. Newberry collects data for behavioral measures such as vocalizations, exploration, and play to assess an animal’s emotional state. For example, vocalization characteristics in farm animals may signify fear, pain, contentment, hunger, or sexual state. Play behavior won’t occur when an animal feels threatened. However, in the absence of fear, play serves as a reward and may even be contagious to other animals in the group. Dr. Newberry hopes to use the information that she gathers from her studies to develop strategies to improve animal welfare through handling and training methods, housing design, specific environmental enrichment programs, and social grouping strategies. She also uses her data to design methods or strategies to prevent and control abnormal behavior.

One area of particular interest to Dr. Newberry and her research group is identifying factors or triggers that lead to the development of injurious behavior in animals. They hope to understand the driving factors behind aggressive and cannibalistic actions and how social learning affects the spread of these behaviors. Information gained from these studies may lead to development of management techniques and systems that reduce the risk of injury caused from these types of negative behaviors and promote animal well-being.

In addition to running her own research program, Dr. Newberry teaches several classes including: Introduction to Animal Science (AS 101); Rights & Welfare of Animals (AS 285); Applied Animal Behavior (AS 485); and Seminar in Animal Sciences (AS 500). In addition, she has served as a mentor and advisor for many graduate, undergraduate, honors, and veterinary student research projects and theses. She has advised students in a variety of studies, including the study of positive reinforcement-based training to reduce stress in captive grizzly bears, welfare of horses in the Arabian horse show circuit, evaluation of handling methods to reduce stress in lab rats, effects of novelty and variety of environmental enrichment objects on nursery pig behavior and productivity, and cat scratching/marking behavior. She is also a nationally recognized expert for the egg industry on issues concerning the influence of handling methods and housing design on the well-being of chickens.

All About Dr. Newberry

Ruth C. Newberry, Associate Professor, received her BSc ('79) in biology and her PhD ('83) in agriculture from the University of Edinburgh. She held a fellowship from the Natural Sciences and Engineering Research Council of Canada at the Pacific Agri-Food Research Centre in Agassiz, British Columbia from 1983–85 where she was employed as a research scientist and adjunct professor. Dr. Newberry joined the WSU Departments of Animal Sciences and Veterinary and Comparative Anatomy, Pharmacology, and Physiology in 1996. She was the first faculty member appointed in the Center for the Study of Animal Well-being. She is a past president of the International Society for Applied Ethology, and is currently a scientific advisor to various national and international groups that address issues of farm animal well-being.

Photo courtesy of USDA-ARS

DEPARTMENT OF ANIMAL SCIENCES

28th Annual Recognition Program

Dr. Doug McFarland is recognized as the Distinguished Graduate in Science, Education and Technology. Dr. McFarland received both his M.S. (1972) and Ph.D. (1984) from WSU. He pioneered methods for isolation of myogenic stem cells and was an expert in avian skeletal muscle development and growth during a time when cell biology models were just emerging in animal agriculture research.

The award for Outstanding Alumnus will be presented to **Jennifer Feusner Leach**. Since graduating from WSU in 1979 with B.S. in Animal Sciences and in 1984 with a M.S. in Adult and Continuing Education, Jennifer has been proactively serving agricultural constituents in the state of Washington. She has influenced many of Washington's youth by organizing after-school activities, especially in communities impacted by poverty.

The Distinguished Service Award will be presented to **Dr. Mike Wedam**, who graduated from WSU with a degree in Animal Sciences in 1979 and a DVM in 1984. He is recognized for his contributions to his community and profession, and to the Department of Animal Sciences, specifically his dedication to dairy instruction, including the experience and advice he has provided advising CUDS and the Dairy Challenge Team.

April 12, 2013–Ensminger Pavilion

Doors open at 4:30 p.m. • Program begins at 5:00 p.m.

For additional information call 509-335-5523

New Courses in Animal Sciences

Advanced Meat Science (AS 460)

is designed to provide junior and senior level students with advanced knowledge and technical expertise needed for careers in the meats industry and/or graduate school and research careers. The course builds upon the foundation of earlier meats courses (AS 260, AS 360) and muscle biology and animal growth courses (AS 345, AS 346), and advances student knowledge in muscle growth, chemical processes of meat, metabolic factors related to meat and meat quality, and microbiology and food safety.

Dr. Min Du

Applied Animal Behavior (AS 485)

is a course that will develop a student's understanding of basic principles governing the behavior of animals; enhance knowledge of the normal behavioral repertoire of common domestic and captive animal species; refine their ability to recognize behavioral signs of health and well-being problems; enable them to learn how to use behavioral analysis techniques to quantify behavior systematically; and to apply basic statistical tests to detect whether behavior differs between animals or animals have changed their behavior.

Dr. Ruth Newberry

Stem Cell Biology, Therapeutics and Regenerative Medicine (AS/PharSci 581)

This jointly-listed course provides information on the latest cutting edge research in the areas of stem cell biology and tissue regeneration. Stem cell therapeutics, gene transfer vectors and methods for isolating, characterizing and generating stem cells will also be major points of emphasis. Practical goals are to increase scientific literacy, enhance presentation skills, improve the student's ability to critically evaluate primary literature, and begin to develop skills in grantsmanship.

Dr. James K. Pru

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For more information or to find out how you can help, please contact:

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