

ANIMAL SCIENCES

Spring 2014

The Inside Scoop



WASHINGTON STATE
UNIVERSITY



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ANIMAL SCIENCES:

Moving Forward



Dr. Margaret E. Benson

Professor and Chair,
Department of
Animal Sciences

~GO COUGS!

When you read through the pages of this year's newsletter you will get a glimpse of some of the impressive accomplishments of our students, faculty, and staff. Watching our students graduate in May and December helps remind us the future of animal science and animal agriculture is in good hands. Seeing our students excited about research discoveries they are a part of, learning about career opportunities from industry partners or guest lecturers, broadening their perspectives with international travel experiences, participating in our clubs and cooperatives, they remind us that the field of animal sciences is dynamic and thriving.

You will also read about two new additions to our faculty who are helping us prepare our students for very diverse careers and futures. Dr. Martin Maquivar has quickly become a favorite student mentor with expertise in livestock management and reproductive biology. His experience with livestock of several species, his veterinary background, and his knowledge of applied reproductive physiology make him a valued addition for teaching several key courses. Angie Reitmeier revived an introductory horse management course this fall that we haven't been able to offer in many years. An estate gift from Louis Murbach made this popular course possible for our students. With Maquivar and Reitmeier on board, our department continues its long history of

instructors committed to student learning and experiential opportunities.

Our faculty and staff continue to make important contributions in research, teaching, and Extension. We are recognized nationally for our research and Extension programs, and faculty efforts are evident through a year of prolific publications and grant awards. Our research efforts would not be as successful without the contributions of our graduate students who are highlighted in this newsletter.

Many of the accomplishments reported this year would not be possible without the resources generously provided by our donors. Supporters of our department are a valued and important part of our department, enabling us to accomplish our missions in teaching, research and Extension. Gifts are essential for empowering us to deliver unique and diverse student experiences, provide undergraduate and graduate scholarships, contribute to the conduct of impactful research, and support additional department needs. I want to thank each and every one of our donors for your continuing support. We will continue to be good stewards of these gifts and use them in preparing the next generation of animal scientists and advancing animal science and animal agriculture.

Thank you for your interest and support.

ANIMAL SCIENCES

The Inside Scoop

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ANNUAL HALVER LECTURE

Dr. Nancy Irlbeck on Research and Careers in Comparative Nutrition

The Halver Endowed Lecture Fund generously supported an invited visit and lecture by Dr. Nancy Irlbeck in September. Irlbeck, a nationally recognized leader in comparative nutrition and an outspoken advocate for undergraduate education, spoke to interested students about research and careers in comparative animal nutrition. She is currently the Associate Dean for Academic Affairs at Colorado State University, but has taught animal nutrition at CSU and has also worked as a consulting nutritionist at the Denver Zoo. Irlbeck became an expert in comparative nutrition through her work with the various animals, birds, and reptiles at that zoo and through her studies in marsupial nutrition while on sabbatical in Australia.

In Dr. Irlbeck's lively lecture and discussion, she talked about her experiences solving a wide assortment of nutritional problems for a number of different species. Her informative presentation was attended by nearly 200 undergraduate and graduate students, staff, and faculty. Afterward, Irlbeck participated in an informal Q and A session, fielding questions from students about how to prepare for, and succeed in, nutrition-focused careers in animal sciences.

The John E. Halver Endowed Lecture was established by Dr. John E. Halver, III (1922–2012), a nutritional biochemist, to engage students in learning about comparative nutrition. Halver earned a BS degree in chemistry, from then-Washington State College, in 1944. He served in the United States Army during World War II, returned to WSC and earned an MS in organic chemistry and then a PhD in medical biochemistry at the University of Washington. Halver has been hailed as a pioneer and leader of research in comparative nutrition research with fish, humans, and other animals, and was lauded as "The Father of Fish Nutrition" upon his induction into the Fisheries Hall of Fame. He developed the basis of commercialized fish feed, which has been used worldwide for over 50 years.



*Engaging students
in learning about
nutrition*



Noteworthy Items

Margaret Benson received the 2013 Distinguished Alumni Award from the University of Kentucky Department of Animal & Food Sciences in September.

Tom Spencer was presented with the Animal Physiology and Endocrinology Award at the national meeting of the American Society of Animal Science in July 2013.

Kristen Johnson received the 2013 Distinguished Teacher Award from the Western Section of the American Society of Animal Science.

Larry Fox was an instructor at the Southern Great Plains Dairy Consortium, and undergraduate students **Kevin Gavin**, **Landon Macy**, and **Jessica Levy** were participants.

Robin White placed 1st in the Pacific Northwest Animal Nutrition Conference Graduate Student Poster Competition and also received the Wilson G. Pond International Travel Award for travel to the Greenhouse Gases & Animal Agriculture Conference in Dublin, Ireland.

Michele Reinelt was a recipient of a 2013 Auvil Fellowship from WSU. She was awarded the Early Career Award at the Showcase for Undergraduate Research & Creative Activities (SURCA), WSU.

Michelle Chan and **Natalie Nelson** have been admitted into the Early Acceptance Undergraduate Program for accelerated entry into Veterinary School at WSU. The students are also recipients of 2014 Auvil Fellowships.

MARTIN MAQUIVAR

Devoted to Excellence in Teaching



“Dr. Maquivar is extremely approachable and very insightful about almost any topic.”

~ McKenzie Corpron
freshman

When a spot in the teaching roster opened up last summer in the WSU Department of Animal Sciences, Dr. Martin Maquivar was recruited to fill it. Maquivar, who grew up in Mexico City, has earned both a Doctor of Veterinary Medicine (2001) and a Master of Science (2003) from the National University of Mexico. He moved to the U.S. in 2006 and earned his PhD in 2011 at The Ohio State University. As a researcher, Maquivar has focused his studies on reproduction and the effects of nutrition on reproduction in cattle. Before coming to WSU, Maquivar worked as a herd health and reproductive specialist at a dairy farm.

Maquivar has always been interested in teaching and understands how important a teacher is to student success in school. Teaching experience during his graduate education, plus education courses that he took, make him a well-qualified instructor. Now teaching several classes in animal sciences, Maquivar is a dedicated educator, saying, “If you truly care for your students and enjoy bringing knowledge to them, then the hours you spend preparing each day, week, quarter, and year will not be done in agony but with passion.”

Moving to the U.S. from Mexico and faced with learning a different culture, language, and educational system, Maquivar has learned to adapt, be flexible, and find new ways to study. He believes this helped him understand that “students in a classroom are diverse in innumerable ways and each one of them represents a challenge to

the teacher to deliver the message or concepts.” He elaborates, “No matter what style of learning or the differences between students’ attitudes, they must have a learning environment that stimulates creativity, development, and appreciation of new things and facts.”

Maquivar’s students clearly appreciate his passion and approach.

“When Dr. Maquivar taught, he was very engaging and passionate about the topic. He made it fun and enjoyable but still serious enough that we learned a lot,” said McKenzie Corpron, a freshman who took Introduction to Animal Sciences [AS101] last fall. “He attended the labs alongside the TA. It showed me that he is very devoted to helping his students learn and fully grasp concepts.”

Senior Ceara Maxwell agreed, saying, “Dr. Maquivar is an awesome professor. I had him for Animal Rights and Welfare [AS285], and he was personable and fair, and made the class very interesting. He challenged the normal thought process people have with animal rights and welfare without imposing his opinion on us.”

Dedicated as he is to teaching, Maquivar unwinds by reading, drawing, playing racquetball, and spending time with his dog, Whiskey. He probably won’t have a lot of play time this spring though, as many more students will experience his teaching philosophy through AS101 as well as Physiology of Reproduction [AS350], another core course in the animal sciences degree program.

Keeping Animal Sciences' Facilities Running Smoothly

Nestled on the east side of campus, off of Airport road and near the WSU Tukey Orchard, is an industrial shop building that is an essential part of the infrastructure of the Department of Animal Sciences. The shop, plus garages and other outbuildings, are all part of Farm Services, the service hub that keeps our animal centers and feed mill operational.

Farm Services folks do the majority of fabrication work for the department—most of the gates and panels at the animal centers were made by them. Keeping all of those structures in good repair is a challenge. However, there isn't much time to fabricate new things these days because aging equipment and facilities require a lot of their attention.

Key to the operation are Damon Burke, Scott Burke, and Jerry Weber. These three men work together to keep everything running smoothly.

On any given day, Damon will most likely be found at one of the animal centers. He spends a great deal of his time working to maintain those buildings and other facilities. Damon



Farm Services Crew

From L to R:
Damon Burke
Scott Burke
Jerry Weber

also works almost full time from May until the end of October pumping out the lagoons at each animal facility. It's a big job, but it has to be done every year to keep the lagoons in compliance with environmental regulations.

Scott is often at one end of a wrench, keeping more than 70 motorized vehicles, from lawn mowers to tractors, running. He recently spent a bit of time doing repairs at the feed mill. Parts for the 20-year-old facility are getting harder to come by, so Scott has to improvise and make some parts himself.

Jerry Weber, manager, keeps everything and everyone at Farm Services organized and on schedule while managing the department's pastures, hauling livestock, repairing equipment, and managing waste at all of the animal centers. Jerry also serves as chair of the department's Safety

Committee and helps to ensure that everyone in the department works in a safe environment.

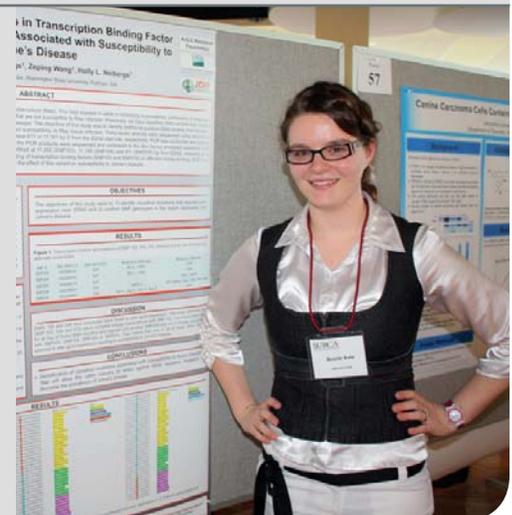
Jerry, Scott, and Damon are integral members of the Department of Animal Sciences at WSU. Their excellent service is recognized by other departments on campus, so while they are quite busy keeping our equipment and animal centers running, they still find time to lend helping hands to those in need.

A photograph of a red sign with white text that reads "Animal Sciences Farm Services". The sign is mounted on a wall. In the background, there is a window showing a view of a farm with green fields and a fence.

Rewards for Excellence in Undergraduate Research

Presenting research data at a national meeting is one way of disseminating new information to colleagues and others in the same field. Undergraduate students have largely been left out of this part of the research loop, until now. A new endowment from a generous donor has been established to recognize outstanding research achievements by undergraduate students in animal sciences. The Undergraduate Travel Award will provide support for attendance at professional meetings, in recognition of having conducted outstanding research.

Students who are currently engaged in research projects in the department have been invited to summarize their research projects and submit abstracts for presenting at a national meeting of a professional society such as the American Society of Animal Science or the Society for the Study of Reproduction. Department faculty are reviewing the abstracts and will determine the recipient of the prestigious travel award. The award winner will be introduced at the department's annual recognition program in April.



New Course in Horse Management & Handling



Breana Zuver sending "Angie" over a "water" obstacle.

"I can't even begin to explain how fun, eye-opening, and revolutionary [this class] was.

*~ Amber Baunach
undergraduate student*



Angie Reitmeier helps Claire Watson load "Sassy" into the trailer.



Jessica Haase sending "Butterscotch" over the cross poles.

Giggles, groans, and words of encouragement were frequently heard this fall out in a field at the corner of NE Terre View Drive and Airport Road. The first group of students to take an introductory course in horse management and handling, led by instructor Angie Reitmeier, were eager to get their hands on a horse and learn. Some students had very little previous experience with horses, while others have worked with them for many years. The four-legged equine "students," who ranged in age from yearling to adult, also had minimal prior training.

The Department of Animal Sciences does not maintain a horse herd, so Reitmeier used horses from the College of Veterinary Medicine, creating a win-win situation for all.

In this class, students learned the basics of horses, their care, and how to handle them safely and effectively from the ground using "natural horsemanship" techniques. These methods employ principles of operant conditioning to reinforce desired behaviors. Thus, students were taught to apply pressure to a horse until it complied or at least tried to comply, and then release the pressure. For example, to move a horse forward, a student might hold a lead rope in her hand and point to the desired direction and then wave a flag (pressure) behind the horse. As soon as the horse moves in the correct direction, the flag waving is stopped, thereby releasing the pressure. These techniques build rapport between horse and handler and communication becomes refined with time and practice.

Using these techniques, students were soon able to catch, halter, and lead their horses on a loose line. Soon

after, they could back their horses, send them over, around, and under obstacles, and ultimately load them into a trailer.

Feedback from students has been positive. "This class was my favorite of all of the classes I have taken here at WSU," said Amber Baunach. Even though she grew up with horses, Baunach said, "I can't even begin to explain how fun, eye-opening, and revolutionary it was. I learned so many ways to work *with* a horse, and am now confident in my communications with horses on the ground. I sincerely believe that to become the best horse person you can, it takes hearing many different ways of doing something and choosing the one [method] that makes most sense to you."

Sophomore Animal Sciences student Breana Zuver agreed, saying, "This class was one of the best I have taken at WSU; Angie is just such a great "horse lady" and mentor. The accomplishment I am most proud of with [my horse] was when I finally felt that she trusted me—we were working with the multi-colored tarp and waving it in the wind. We used crops and various "arm-lengtheners" to make the tarp tall enough for our "ponies" to go under while we took turns leading them under the tarp. I was nervous my bay Arabian would bolt. I was happily surprised, however, when, on the second try, she walked calmly and respectfully underneath and everyone said 'I want your horse!'"

A very popular course, it has 20 new students enrolled this spring. While the four yearling fillies used in the fall course are continuing their "education" this spring, the rest of the four-legged "students" are new and on their way to becoming solid citizens.

Combining Agriculture and Science

with Galen Williams



Originally from Olympia, Galen Williams earned his BS in Biotechnology at the University of California, Davis, but returned to Washington for an advanced degree in 2004. Williams developed a strong interest in genomics and animal sciences because of his experiences as a student resident at the UC Davis dairy and goat facility and also while he worked in several laboratories in the animal science department there. He wanted to find a master's degree program that would meld his interests. "I found that in the Department of Animal Sciences at WSU with Dr. Jiang," said Williams.

At WSU, Williams studied the genetic complexity of cryptorchidism in sheep. Cryptorchidism is a common genital problem in males in which one testicle does not descend or only partially descends into the scrotum. Undescended testes can result in reduced fertility and other problems later in life. Data from Williams' research can be applied to other species in an effort to understand what causes the problem.

While science was the reason that Williams came to WSU, he especially enjoyed serving as a teaching assistant for AS101. "Visiting the animal sites and facilitating hands-on labs were great experiences that served as a reminder of the core reasons for animal science research, including my project," he said.

Before Williams graduated from WSU in 2006, he landed a job as a Research Assistant III at Devers Eye Institute in Portland. "I was hired into the Optic Nerve Head Research Laboratory and have since been promoted to where I now supervise the other technicians

in the lab," Williams said. "We study the pathophysiology of glaucomatous optic nerve head damage." Using optical coherence tomography (OCT), which is similar to ultrasonography but uses light instead of sound and provides higher resolution, Williams images the optic nerve and retina to study glaucoma in live monkeys. "We are able to assess the relationship of structural and functional measures at the very earliest stages of the disease, long before a human would notice vision loss," said Williams.

"My degree is quite applicable to my career," Williams said. "Since we use an animal model, it has been helpful to have a broad base of comparative anatomy and physiology while monitoring animals under anesthesia and assisting during surgeries."

Other Ventures

Outside his "day job," Williams has partnered with a friend, Pete Mulligan, to found Bull Run Cider (www.bullruncider.com), a craft hard cider company, in 2010, when the hard cider industry was just starting to generate some interest. "Several years of recipe development and licensing hurdles resulted in our first ciders being released last spring," said Williams. "In February of this year we are expanding our distribution into western Washington, from Vancouver to Bellingham."

Even as his career and cider venture bloom, Williams and his wife Sarah find their personal horizons expanding as well: They are expecting their first child in April.

Welcome New Staff Members!



Blair Ehlert joined the department in October 2013 as the new manager of the EALB Vivarium. Blair is excited to manage a vivarium as diverse as ours. Blair and her husband recently welcomed son, Hampton Alexander, to their family.

Leila Styer has been at WSU for more than 20 years. In Spring 2013, she joined the department as an Office Assistant. In the photo to the right, Leila is shown with her filly, "SR Classy To A TE." Leila and her husband raise champion Tobiano Paint horses.



ANIMAL SCIENCES STUDENT CLUBS



Block and Bridle is an organization for students from multiple majors interested in any 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 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 information, activities and, of course, cookies and milk. Members attend dairy industry conferences throughout the year. Dairy Club's community outreach includes Dairy Olympics at the Knott Dairy Center, and fundraisers such as Dairy Banquet and cheese sales at Farm Credit Services in Spokane. Other activities include Spring Barrel Tasting in Prosser, and Cougar Youth Weekend (CYW). During CYW, students aged 8 to 18 are invited to learn about dairy foods, animals, and the dairy industry, as well as how to fit and show or judge dairy animals. As members say, "Dairy Club is UDDERLY fantastic!"



Members of **Collegiate Horsemen's Association (CHA)** are interested in all things horse-related. They welcome and encourage anyone to join, regardless of horse experience. Club activities include talks and meetings with horse industry professionals, including an equine dentist, a farrier, and an equine veterinary resident. Members are planning to visit local horse operations to see world-class cutting and reining horses and meet their trainers. Members are planning to volunteer at REACH, a rescue operation for neglected and abused horses. In the future, the club would like to sponsor a poker ride or a "horse fun" day for area youth. For more information, look for their Facebook page (WSU Collegiate Horsemen's Association) or email them at wsucollegiatehorsemen@yahoo.com.



The **Companion Animal Club** is dedicated to educating and providing members with hands-on experiences with all species of companion animals. The club arranges educational field trips, chances to interact with live animals, socializing opportunities, and great guest speakers who talk about companion animals, careers, volunteering opportunities, and more. So far, members have worked with the Whitman County Humane Society, held doggy bandana-making fundraisers, organized dog handling practices and worked on the Pet Your Stress Away event. Anyone from any major is welcome to join. Email wsucac@live.com for more information!

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 learn to formulate and execute management decisions as well as perform 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 (CCF) is a student-run cooperative in the Department of Animal Sciences. Advised by Dr. Mark Nelson and the Beef Committee, CCF feeds and cares for a herd of approximately 50 cattle, including heifers and steers from the Ensminger Beef Center and donated steers from various beef producers in Washington. CCF is responsible for formulating diets, cleaning cattle facilities, and marketing cattle. Funds raised by the group are used to finance both educational opportunities for CCF members and scholarships for WSU students involved or interested in the beef industry.



Student Swine Cooperative (SCC) is a student organization for members to learn about all aspects of swine production and to share their knowledge and expertise with 4-H and FFA members. SCC members are currently evaluating options for feeding their pigs on campus, in light of recent facility changes. SCC has participated in numerous events including the Palouse Empire Fair, Latah County Fair, Swine Information Day in Moses Lake, show pig auctions, and more.



National Quiz Bowl Champs, from L to R Megan Cihak, Danielle Meyers, Brooke Vander Veen, and Kevin Gavin.

WSU DAIRY CLUB

National Quiz Bowl Champions!

The Washington State University Dairy Club earned first place in the American Dairy Science Association-Student Affiliate Division Quiz Bowl. Twelve universities were represented at the contest at the annual national meeting on July 7, 2013. The WSU team of Danielle Meyers, Brooke Vander Veen, Megan Cihak, and Kevin Gavin, with Jessica Levy as alternate, swept the final round against a Cal Poly team and cruised to victory. Dairy Club members prepared during the year studying dairy food science, dairy management and production, and history and organization of the American Dairy Science Association. The Quiz Bowl Trophy has only been out west once prior in the last 12 years when a Cal Poly team took first place. Three of the team members are eligible to compete next year and represent WSU as defending champs!

Graduate Students—Who They Are



The Future of Animal Sciences

Embracing new ideas and engaging in research

Back row, L to R: Robin White, Christopher Gambino, Qiyuan Yang, Rui Li, Brooke Compton, Jennifer Kiser; Middle row, L to R: Andrew Kelleher, Yanting Chen, Guiling Ma, Naisi Li, Shuwen Zhang, Meghan Munter; Front row, L to R: Bo Wang, Ashley Conway, Melissa McCallum

Graduate students in the Department of Animal Sciences are involved in five major areas of research

RESEARCH AREA	STUDENTS (DEGREE, PROF)
<p>Behavior & Well-Being</p> <p>Research is focused on identifying environmental and genetic contributions to the health and well-being of animals.</p>	<p>Lindsay Ellsworth (PhD, Newberry/Johnson), Leticia Fanucchi (PhD, Newberry/Johnson), Benjamin Enger (MS, Fox)</p>
<p>Environmental Sustainability/Nutrition</p> <p>Air, land, and water quality are examined to understand how they are affected by animal agriculture and to develop management strategies for sustainable production. Basic and applied research in nutrition is conducted with beef and dairy cattle, sheep, swine, and laboratory animals. This work includes animal metabolism, energy nutrition, and utilization of by-product feedstuffs.</p>	<p>Yanting Chen (PhD, Harrison), Ashley Conway (MS, Johnson), Christopher Gambino (PhD, Johnson), Guiling Ma (PhD, Harrison), Robin White (PhD, Johnson)</p>
<p>Genetics/Genomics</p> <p>Research projects include understanding genome structure, function, and evolution, and developing quantitative and molecular genomic approaches for improving animal production, product quality, and health.</p>	<p>Jennifer Kiser (MS, Neibergs), Rui Li (PhD, Jiang), Mahesh Neupane (PhD, Neibergs), Shuwen Zhang (PhD, Jiang)</p>
<p>Growth/Muscle/Meat Science</p> <p>Projects run the gamut of basic and applied research and include defining the molecular mechanisms of muscle development, physiological responses to growth regulators, meat quality improvement, and food safety.</p>	<p>Xing Fu (PhD, Du), Shawn Harris (PhD, Du), Naisi Li (MS, Rodgers), Joe Maricelli (PhD, Rodgers/SMB), Carl Rogers (PhD, Du), Bo Wang (PhD, Du), Qiyuan Yang (PhD, Du)</p>
<p>Reproductive Biology/Physiology</p> <p>Research in reproductive biology/physiology includes endocrinology and embryo development that is both basic and applied, using cattle, sheep, swine, and rodent models.</p>	<p>Kelsey Brooks (PhD, Spencer), Gregory Burns (PhD, Spencer), Brooke Compton (MS, Pru), Brenda Jesernig (MS, Spencer), Andrew Kelleher (PhD, Spencer), Melissa McCallum (MS, Pru), Meghan Munter (MS, McLean/Pru), Peng Wang (PhD, Spencer)</p>

...And Examples of What They Do



Preventing Diabetes and Obesity

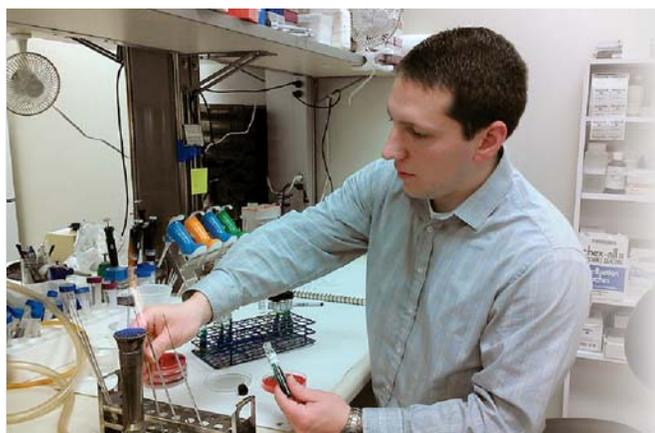
Xing Fu, PhD candidate

More than two-thirds of adults in the U.S. age 20 or over are overweight or obese, and approximately 21 million U.S. citizens have diabetes. Both health problems are predicted to continue to increase. AMP-activated protein kinase (AMPK) is a very important enzyme that may aid in prevention of obesity and diabetes, both of which are usually associated with impaired muscle function. My research has found that AMPK plays an important role in muscle development, growth, and regeneration. I am currently conducting experiments to study the role of AMPK in prenatal muscle development. My research is very important in ensuring proper muscle function, which can relieve obesity and diabetes by increasing energy consumption. My research may also help ensure proper muscle development in the fetus of an obese mother.

Using the Cattle Genome to Fight Johne's Disease

Jennifer Kiser, MS candidate

Johne's disease is a contagious, chronic, and often fatal disease of dairy cattle and other ruminants that is caused by the bacterium *Mycobacterium avium paratuberculosis* (MAP). The disease is an industry-wide problem—at least 65% of U.S. dairy operations are infected with MAP, which costs the U.S. dairy industry a staggering \$200–\$250 million per year in lost productivity. There is no cure, but some animals are less susceptible to infection with MAP. I am studying the cattle genome to find why some cattle are not as likely as others to contract Johne's disease. I have found a region on bovine chromosome 9 that has more than 1400 single nucleotide polymorphisms (SNPs), or genetic variations. I am in the process of screening these SNPs to determine if one or more plays a direct role in the outcome of MAP infection.



Optimizing Pre-Milking Treatments to Reduce Mastitis

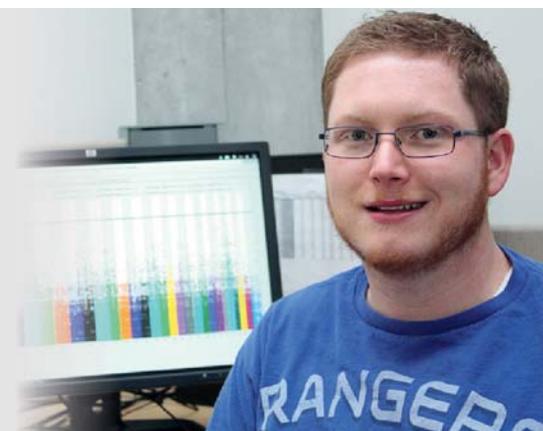
Benjamin Enger, MS candidate

Mastitis is a common and major problem in dairy cattle that can be economically devastating to dairy farmers. Bacteria present in the environment or on the skin of a cow's udder can cause mastitis. While there are many methods to eliminate the bacteria, the most common method of control is to dip the teats in an antiseptic solution before and after milking. Numerous publications suggest that the teats should be immersed in a disinfectant dip for at least 30 seconds before milking; however, there is no empirical evidence to support this claim. I am testing the contact time of several pre-milking dips to determine how long teats should be immersed to eliminate or reduce the number of bacteria to acceptable levels.

Understanding Exosomes to Improve Reproductive Efficiency

Gregory Burns, PhD candidate

The greatest limitation to reproductive efficiency across all mammalian species is embryonic mortality. We have been using systems biology and bioinformatics approaches to explore the role of small membrane-bound vesicles, called exosomes, as a novel communication method during the critical peri-implantation period in sheep. These data can then be used as a springboard for the study of exosomes in dairy and beef cattle around the time of conceptus implantation, coincident with up to 80% of pregnancy loss. We believe that exosomes are an important atypical form of communication between the conceptus and uterine endometrium prior to implantation. Understanding this communication will fill a significant knowledge gap and help to improve reproductive efficiency.



Experiencing Education: Internships & Study Abroad

MEGHAN NYQUIST

Compassion for Horses

Meghan Nyquist didn't have much prior experience with horses and wanted to learn more about them. She found and applied to an intriguing internship program with Days End Farm Horse Rescue (DEFHR), a nationally respected equine rescue and rehabilitation facility in Maryland. Nyquist was accepted into the program and left for Maryland after her freshman year at WSU in May 2013.

Equine rehabilitation after seizure from bad situations is hard work, she soon discovered. Shortly after she arrived in Maryland, four ponies and five horses were seized by Animal Control and brought to DEFHR for rehabilitation and care while the court case for animal neglect was pending. Nyquist and the three other residential interns were

put in charge of caring for the horses and ponies who had to be isolated from other horses for at least three weeks. Many of the horses were very thin and had to be fed small meals at frequent intervals. Nyquist had to help feed and check on the horses at three-hour intervals throughout the day and night. She was also responsible for mucking stalls, grooming, and treating or medicating all of the horses.

Nyquist spent many sleepless nights caring for the horses, but came to love each one of them and was glad to see them gain weight and become healthy. "Seeing these horses transform in this way both reinforced my love of horses and made me realize that I want to help these animals and work with them for the rest of my life," she said.



The most rewarding thing about her experience at DEFHR was learning that many of the horses she helped recover have been placed in good homes. As for what she learned from her experience, Nyquist said, "It made me appreciate how much horse rescues like Days End Farm have to do from day to day to rehabilitate horses, and how much compassion, patience, and hard work go into it all."

STEPHANIE WEBB

Equine Medicine "Down Under"



Stephanie Webb, a junior from Lynnwood, left for Sydney, Australia, on Memorial Day, 2013 for an internship at an equine veterinary hospital. Webb's apartment in Sydney was a 1½-hour bus ride to work. "I'm a little directionally challenged," laughs Webb as she reflected on the challenge of getting to work. "I sometimes got on the wrong bus."

Since the equine hospital was located very near the Royal Randwick Racecourse, most of the clients were racehorses. Webb was soon immersed in equine medicine and assisted with radiographs and surgery. "We did a lot of tie-back surgeries," said Webb. Tie-back surgeries are often performed in horses who are exercise intolerant because of nerve damage in the larynx. When this nerve does not function properly, a flap of cartilage in the larynx doesn't open fully or remains closed, impeding airflow

into the trachea and lungs. The flap of cartilage can often be surgically tacked, or tied back, to improve airflow. Webb also learned to draw blood and administer medications, and spent time grooming and exercising the equine patients.

Webb worked four days a week and had plenty of time to socialize with her new friends and explore Sydney and the surroundings. She visited the Opera House and the Taronga Zoo in Sydney, as well as the RainForeStation Nature Park near Cairns where she fed kangaroos and wallabies and held a koala. Webb also tried surfing but decided it was harder than it looks.

Webb had many positive things to say about her experiences. Getting to Australia certainly wasn't cheap, but, "I see this as an investment in my education," said Webb, who wants to become a large animal veterinarian.

Internships and study abroad programs influence career paths, expand world views, and increase self-confidence and maturity. Students gain real-world perspective of a field or industry and gain valuable work experience. Being challenged to apply what they have learned in the classroom to real-life situations helps students develop and build upon skills.

For study abroad and internship program opportunities, visit: <http://www.ansci.wsu.edu/internships.aspx>. Resources are also available at Global Learning in the Office of International Programs.

ASHALYNN BILTON-SMITH

Animal Agriculture in the Mediterranean



Ashalynn Bilton-Smith, a junior from Centralia, spent the summer of 2013 in Cyprus, an island country in the eastern Mediterranean. Bilton-Smith earned three credits in Animal Health and Disease by attending class four days a week. Three of those days were spent in lecture and the fourth was spent visiting farms in Cyprus. While there are no beef cattle operations on the island, Bilton-Smith got to see modern poultry, dairy, and swine facilities. She even visited an organic dairy goat farm.

Not only did Bilton-Smith learn about animal agriculture in Cyprus, but she also learned about the history of the island, dating back to ancient Greece. In her free time, she managed to get out with her fellow students and visited some sites that were significant in Greek mythology, including Paphos, where, it is said, the goddess Aphrodite rose from the waves.

Bilton-Smith also enjoyed the culture of Cyprus. “Everyone is so laid back,” she said. “Everything is closed on Sundays. During the weekday everyone goes home from noon to 3:00 pm [during the hottest part of the day] and takes a siesta.”

Study abroad programs provide more than just classroom education and exposure to a different culture. “My experience in Cyprus gave me confidence,” said Bilton-Smith. “I had to do everything on my own—apply for a passport and travel alone to a country where they speak a different language.”

Bilton-Smith is currently applying for a summer internship with Murphy-Brown, LLC, a subsidiary of Smithfield Foods that produces pork products. She knows that her experiences in Cyprus, as well as in other internships will certainly help her in becoming a swine veterinarian.

MELISSA BOYER

Producción lechera en Perú

(Dairy production in Peru)

Learning about the dairy industry in Spanish can be challenging, but it was a challenge that Melissa Boyer was ready to meet. A senior from Redmond, majoring in Animal Sciences and minoring in Spanish, she spent last summer at La Querencia, a dairy located 30 kilometers south of Lima, Peru.

La Querencia is one of the most modern dairies in Peru. Using a double 12 parallel parlor, they milk about 300 cows a day, producing about 260,000 liters of milk per month and marketing most of their milk to Laive, the second largest dairy processor in Peru. Boyer learned that most milk produced in Peru is packaged differently than it

is in the U.S.—a small amount of fresh milk is sold locally, but most is packaged to have a long shelf life without refrigeration.

Conversing only in Spanish, Boyer worked primarily with a veterinarian and two other herdsmen who lived on the farm. “My duties included assisting the veterinarian with herd health checks, pregnancy checks, and medical procedures,” said Boyer. She also helped heat check and artificially inseminate cows and heifers. Since she was at the dairy during their peak calving season, Boyer attend calvings, both day and night, and was respon-



sible for administering colostrum to newborn calves.

Boyer’s venture to La Querencia taught her how to apply classroom knowledge to real-world dairy production, which will help make her a better veterinarian in the future. But she didn’t spend all of her time working and learning about dairying in Peru. She took advantage of her international experience and did some sightseeing, making several trips to Lima and surrounding towns to explore and experience the broader Peruvian culture.

Nutrition Study at the Knott Dairy Center Answers an Important Question



QUESTION:

Can a fermented ammoniated condensed whey product be used in modern northwest dairy cow diets?

WHY WAS THIS STUDY IMPORTANT?

This product is a relatively cheap source of high-quality protein that can partially replace more expensive protein feeds. It may also help improve efficiency of nitrogen use by dairy cows, which would reduce nitrogen excretion.

WHAT WAS THE ANSWER?

Fermented ammoniated condensed whey can be added to dairy cow diets without affecting milk production. An added benefit of the product is its potential to improve efficiency of nitrogen usage.

WHAT ARE THE IMPLICATIONS?

Cheaper sources of protein improve the bottom line. And, cows that use nitrogen more efficiently have less nitrogen in their manure, which means that less nitrogen escapes into the environment.

For additional information, contact Dr. John McNamara.

WSU ANIMAL SCIENCES:

A Solid Foundation on the Road to Becoming a Feedlot Nutritionist

When we last interviewed Elizabeth Domy, she had graduated from WSU in 2009 and was working on her MS in animal nutrition at Colorado State University, which she finished in May 2011. After that, Domy earned a PhD in ruminant nutrition from Texas Tech University, in August 2013. At Texas Tech, Domy studied how the concentration of roughage and the bulk density of steam-flaked corn in diets containing Sweet Bran® wet corn gluten feed (WCGF) affected feedlot cattle performance, carcass characteristics, and nutrient digestibility. Results from her work provide valuable data that can be used to construct balanced diets for feedlot cattle, and were published in the *Journal of Animal Science*.



Elizabeth Domy
BS AnSci '09

Domy is currently a Beef Enterprise Nutritionist with Cargill Animal Nutrition in Amarillo, Texas. She started working for Cargill shortly after graduating from Texas Tech and says, "Learning about the business aspects of the industry has been challenging." Fortunately, she loves her job. While technical support, consulting, and diet formulation duties keep her busy, she says she also finds time to be part of the research team at Cargill because, "I really enjoy science and research."

While her advanced degrees in animal and ruminant nutrition have led to Domy's current job, she credits her undergraduate experiences at WSU for her excellent foundation. At WSU, Domy got her first taste of research working on a project with Dr. Holly Neibergs. Other hands-on experiences, especially those gained through participation in Cougar Cattle Feeders, were also important in shaping Domy's career path. "Cougar Cattle Feeders gave me a better idea of what to expect," said Domy. Guidance and advice from faculty members was also invaluable. "Dr. Kris Johnson was an excellent mentor," said Domy. "She is a talented teacher and had high expectations that challenged me to become better. As an advisor, she always gave me enough information to make a good decision while still giving me the freedom to make my own choice." Domy looks back on that balance of guidance and encouragement as being not only very beneficial, but also a good example of Cougar spirit and quality.

Farewell to Faculty Members

- Derek McLean left the department and took a position at OmniGen Research in Corvallis, OR. Dr. McLean taught Physiology of Reproduction [AS350] and was a highly regarded instructor. He also had an active research program in reproductive biology. McLean will continue to serve the department and WSU as an adjunct faculty member.
- Ruth Newberry departed Pullman and is currently a faculty member at the Norwegian University of Life Sciences in Ås, Norway. While at WSU, Dr. Newberry was especially known for her Rights and Welfare of Animals course [AS285] and her research program in animal behavior. Newberry will also continue to serve as an adjunct faculty member.
- Raymond Wright, Jr., retired in November. He was a faculty member in the Department of Animal Sciences for 38 years and served as Chair from 1997–2005. Dr. Wright's research program focused on understanding early embryo development. He was also an instructor of several courses at both the undergraduate and graduate student levels.

DEPARTMENT OF ANIMAL SCIENCES

29th Annual Recognition Program



*Join us for an informal
barbecue and help
us celebrate the
accomplishments of
our students, staff,
faculty, and alumni!*

We applaud **Dr. James Dias**, the Distinguished Graduate in Science, Education, and Technology. Dr. Dias is a leader in the study of follicle stimulating hormone (FSH) structure and function. His lifelong goal has been to use our knowledge of FSH and its receptor to improve gonadotropin therapy and to develop a non-steroidal contraceptive. Recent discoveries in his lab may lead to therapies for estrogen-dependent breast cancer and endometriosis.

The Outstanding Alumnus Award will be presented to **Dr. Ching-Fong Chang**. Dr. Chang earned advanced degrees at WSU with Dr. Liné Estergreen (MS, 1982) and Dr. Jerry Reeves (PhD, 1986). Now at the National Taiwan Ocean University in Keelung, Taiwan, Dr. Chang is an expert on the reproductive physiology and endocrinology of many aquatic species. He has conducted pioneering studies that may lead to the restoration of coral reefs.

Randy Baldree is the recipient of the Distinguished Service Award. Once a county extension agent, he has risen through the ranks and is now Director of the Natural Resource and Extension Program Unit in CAHNRS and Assistant Director of WSU Extension. Baldree is an ambassador for animal agriculture in the state of Washington and represents the Department of Animal Sciences and WSU with enthusiasm and integrity.

April 11, 2014
Ensminger Pavilion

Doors open at 4:30 p.m.

Program begins at 5:00 p.m.

For additional information
call 509-335-5523



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

Margaret Benson, Chair
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(509) 335-5523