ANIMAL SCIENCES: Moving Forward

It feels like we just put out the 2017 issue of The Inside Scoop and now it is time for 2018! Much has happened in the department and I think you will find that we have a lot of news. Our undergraduate and graduate students continue to do amazing things, including participating in tremendous internships, a few of which you will read about in this issue. Excellent science that benefits animal and human well-being is conducted by undergraduate and graduate students under the direction of our world-class faculty. Animal Science departments are known for their dedication and devotion to students, stakeholders and excellence in research. WSU Animal Science faculty continue that tradition and are among the most dedicated and productive in the university. You will get a small taste of all that is going on in this edition.

Our faculty and students have won numerous awards and honors, published numerous papers, and received many grants this year, all of which recognize excellence in teaching, research and extension.

Our undergraduate enrollment has increased 10 years in a row and we now serve 460 undergraduate students. We used to tell you that most all were pre-vet but that is changing a bit. More of our incoming students are interested in management and production and many of the pre-vet students change their minds and decide other careers in animal agriculture are for them. As that occurs, we need your help to identify experiential learning production-oriented internship opportunities.

Retirements continue with Dr. Mark Nelson, Dr. Larry Fox, and Dr. Jan Busboom transitioning out. This has created some challenges for us because these people leave big holes in the department. But, we are happy for them as they move into their new chapters and have time to do the things they have wanted to do. We continue to work with the college administration to allow us to fill these large holes and keep the department on a positive trajectory. Staff retirements have also created changes. Ferris Ferrar from the Knott Dairy Center retired and moved to Colorado, Roger Collins from the Beef Center retired and is enjoying life in Lewiston, Idaho and John Swain transitioned from manager of the Knott Dairy to an instructor in the department. John is coaching the Dairy Challenge Teams, teaching dairy management classes, and AI & Preg Check. We are happy to still have him available to our students. We thank Ferris, Roger and John for a combined 98 years of service to our faculty, staff, students and stakeholders! These are big shoes for the new staff to fill, but they are great role models. We are also excited to add Dr. Don Llewellyn who is moving to Pullman to add some teaching to his already full and productive plate. Our students will benefit greatly from his practical experience.

We hope you enjoy this issue of The Inside Scoop. Thank you for all you do in support of the Department of Animal Sciences. Please keep in touch.

Dr. Kristen A. Johnson
Professor and Interim Chair, Department of Animal Sciences

Go Cougs!
Imagine a future where a cattle producer can program calf productivity by feeding a customized diet to his pregnant cows, or where a pregnant woman can add specific ingredients to her diet to program her unborn child to be resistant to obesity or diseases later in life.

Dr. Min Du and his team are studying how maternal nutrition affects expression of key transcription factors (tools cells use to turn genes on and off) that program fetal stem cells into muscle or fat cells. Interestingly, both cell types are derived from a common pool of stem cells. Most of the skeletal muscle and fat cells in an adult animal develop during the fetal stage, making this period a critical programming stage to induce changes that may persist into later life.

Maternal nutrition is ultra important!

Maternal nutrition during gestation dramatically affects fetal development and has long-term effects on adult health. Human maternal obesity leads to abnormal muscle and fat development in offspring, predisposing them to obesity, cardiovascular diseases, stroke, insulin resistance, type 2 diabetes, and hypertension in adulthood. Maternal undernutrition is especially important in agricultural animals because it adversely affects the number of stem cells that develop into muscle cells, leading to offspring with low birth weights, decreased muscle mass, low production efficiency, and decreased marbling and meat quality.

Emerging evidence suggests that vitamin A may affect obesity, but the mechanisms are largely unknown. In a research paper published in the Journal of Molecular Cell Biology in August 2017, Bo Wang, a former PhD student in Du’s group, reported that adding retinoic acid, a primary metabolite of vitamin A, to stem cells cultured in the lab blocked their differentiation into fat cells (adipogenesis), suggesting that the vitamin may be used for fetal programming. While working with the Du group, he discovered that retinoic acid inhibited the expression of the Zfp423 (Zinc finger protein 423) gene, a key transcription factor that initiates adipogenesis, by interfering with DNA demethylation, a process that is critical for cellular differentiation. He also found that feeding vitamin A ameliorated diet-induced obesity by reducing fat accumulation, blood glucose, and serum triglycerides and insulin in mice fed a high-fat diet.

Du’s team has also been studying resveratrol, another compound touted for its anti-obesity effects. Resveratrol is a natural polyphenol compound found in the skins of many common fruits such as grapes, blueberries, and raspberries. Previous studies in mice and humans suggest that resveratrol consumption decreases adipogenesis, enhances breakdown of fat, and elevates metabolic activity. Du’s group is trying to discover how resveratrol acts as an anti-obesogen. Research published by the Du team in the Journal of Physiology in January 2017 provided evidence that resveratrol supplementation reduced circulating levels of triglycerides and insulin in pregnant mice fed a high-fat diet. Furthermore, resveratrol induced production of “good” (brown/beige) fat in their offspring, which protected them from diet-induced obesity and related metabolic complications.

Good fat vs. bad fat

There are different forms of fat tissue. White fat is the most common type of fat and is widely distributed throughout the body. Its main function is energy storage. Brown fat is found in a few, localized areas. These specialized cells produce heat and can suppress weight gain and metabolic diseases. Beige fat cells develop in white adipose tissue in response to various stimuli, such as cold temperatures or chemical compounds like resveratrol, and when stimulated, function similarly to brown fat cells.

Because it is easy to manipulate vitamin A and resveratrol intake, Du’s discoveries may profoundly impact human health and animal production in the future. Stay tuned for additional exciting reports of cutting-edge research from the Du lab.
NATHANIEL HERRERA had no prior experience in animal agriculture before he came to Washington State University from Southern California. Because he liked science and animals, Herrera chose to major in animal sciences and hasn’t looked back.

He got a job with the USDA in Pullman where he contributed to scrapie research in sheep and goats and studied the effects of the parasite that causes East Coast Fever in cattle. He was a member of the WSU Cougar rowing team for two years, served as the University Recreation liaison for the men’s crew team, and was president of the WSU Sport Club Federation Council. He started working at the WSU Knott Dairy Center in 2016 and is an active member of CUDS. Herrera is also coaching a kindergarten soccer team in Pullman.

Looking for a summer adventure, Herrera spent June and July 2017 in eastern Africa where he participated in several summer sessions sponsored by The School for Field Studies. He was involved in hands-on field exercises, expeditions, and research in northern Tanzania. He learned about wildlife management, sustainable wildlife and environmental conservation, and the relationship between animals and people in the area. Some of his work contributed to the long-term goals of the research center.

Going on a safari is a once-in-a-lifetime experience for most people. For Herrera, it soon became commonplace because he was in the heart of the African safari circuit, close to many famous national parks and unique ecosystems. Much of his coursework and research took place in Ngorongoro Crater and Lake Manyara, Tarangire and Serengeti national parks. When gathering research data, seven people went out as a team. They used line transect and point count methods to study migration patterns and estimate abundance of wildlife species in an area.

Herrera’s specific research project focused on necking behavior in giraffes. This behavior, in which the giraffes swing their necks and deliver sledgehammer-like blows with their heads and ossicones, horn-like protuberances on the head, is exhibited only by males and determines dominance or social hierarchy. He found that male homosexual dominance behavior is positively correlated to the size of a giraffe’s neck.

Herrera learned that people in Tanzania live day-to-day. Subsistence farming is susceptible to damage by weather and wildlife. “During the wet season it rains a lot in Tanzania,” he said. “We showed the farmers how to decrease soil erosion by digging trenches.”

While Herrera learned a lot about African wildlife, he discovered that he really liked participating in community service. He had one free day each week and spent it fixing and painting the local school, and interacting with children. “I played with the kids a lot,” he said. “It was one of the most memorable moments I had in Tanzania!”

Herrera will graduate in May 2019 with a bachelor of science in animal sciences and minors in chemistry, biology, and environmental science. He said he hopes to go to veterinary school at the University of California – Davis where he would like to focus on dairy cattle and companion animal medicine.
ALECIA FOX is a young woman with a passion for speed, fast horses, and the dairy industry. The 2012 graduate of Prairie High School in Battleground attended Walla Walla Community College before transferring to WSU in August 2015. Fox attended classes at WWCC and competed with the collegiate rodeo team. She was the 2014 Rookie of the Year in the Valley Girls Barrel Racing Association, was a top 20 finalist in the BRN4D (Barrel Racers National 4D) Association, and placed in the Open Average at the Washington National Barrel Horse Association finals.

CAREER OPTIONS IN ANIMAL AG

Fox originally planned to become a veterinarian, but after beginning her courses in animal sciences learned there are more career options in animal agriculture.

No longer sure that veterinary medicine was her calling, Fox attended a career networking night hosted by the department to learn how she could use her degree in animal sciences. There, she met representatives from Threemile Canyon Farms, one of the nation’s largest dairy operations based in Boardman, Oregon. Impressed by Threemile’s size and intrigued by their use of technology and sustainable practices, Fox did some additional online research about their operation and contacted them about participating in a summer internship program.

INTERNSHIPS = EXPERIENCE

Fox spent the past two summers working and learning about the dairy industry at Threemile Canyon Farms. The first summer she was stationed at Six Mile Land & Cattle where they raise dairy youngstock for Columbia River Dairy. She learned about management practices, weighed calves, collected blood samples, administered vaccinations, and gathered ear notch samples for genetic testing. She sorted, tagged, and vaccinated breeding-age animals. She even spent a few weeks with the embryo transfer team and learned about in vitro fertilization procedures. The second summer she interned at Cold Springs Organic Dairy and learned about regulations and management practices involved in organic dairy production. She was primarily responsible for pasture management, where she measured pastures before and after grazing and used these measurements to calculate dry matter intake. She was also responsible for record keeping and monitoring cattle body condition scores.

A JOB RIGHT AFTER GRADUATION

Fox’s education in animal sciences, the experiences gained during her internships, and a job at WSU’s Knott Dairy Center fueled her desire for a career in the dairy industry. After she graduated in December 2017 with a bachelor of science degree in animal sciences and a minor in economics, she began working at Creamline Farms in Umapine, Oregon, where she is mainly responsible for care of 600-plus calves in hutches.

ADVICE FOR STUDENTS

“Students should take advantage of every opportunity,” said Fox when asked if she had any advice for undergraduates in animal sciences. “Attend the career networking nights, talk to industry professionals and do everything you can to get an internship before graduation. My internships gave me a world of experience and confirmed my passion for the industry!”

TIME IN THE SADDLE

During her free time, Fox is competing in the Northwest barrel futurity run, which includes races in Washington, Oregon, Idaho, and Montana, with Sierra on the Rocks, her bay 4-year old colt affectionately known as Mitch. She plans to do the same in 2019 with Cisco San Nick, her buckskin gelding. Her ultimate goal is to compete with two open horses and train and sell one colt each year.
Karena Gutierrez grew up on a sheep farm in southern Idaho where her family has about 50 Suffolk x Dorset crossbred ewes. Her mom manages the sheep farm while her dad runs a mobile veterinary practice in the area.

Gutierrez is passionate about earning a degree in veterinary medicine and said she believes that networking is extremely important for personal and professional growth. To this end, she used her connections with Zoetis, a global animal health company, to secure an opportunity to learn about animal agriculture in New Zealand.

Jetting away from summer at home in Idaho, Gutierrez spent two winter months last year in the “Land Down Under.” During her stay, she visited 11 farms, including sheep and beef cattle stations, dairy farms, vet clinics, universities, and even a famous movie set.

“I lived with the families and worked alongside them each day,” she said. “I helped vaccinate, muster up livestock on horseback, and move break fence, which is hot wire that separates pastures.” Gutierrez learned the most about New Zealand’s culture, international trade, and animal production while working alongside her hosts.

New Zealand Dairy Farming

She learned that dairy farming in New Zealand is different from the United States. Most dairy farms in New Zealand are pasture-based. It is not unusual for cows to walk two to three miles from pasture to the milking parlor. Farmers milk Kiwi-cross cows. These Jersey x Holstein crossbred cows are smaller than contemporary Holsteins.

For the most part, New Zealand dairy production is seasonal. Cows calve in the spring, from July to September. Most cows are dried off in the late fall/early winter around May or June. Almost all the milk is converted to milk powder and exported. A small number of farmers produce milk year-round for domestic consumption.

Sheep Farming in “Middle-earth”

Gutierrez had a unique experience at one sheep farm on the North Island. This bucolic farm was home to the Hobbiton™ movie set used for key scenes in The Lord of the Rings trilogy and The Hobbit series. After the movies were filmed, the set was preserved so tourists could visit and experience the fictional home of the Hobbits. In the spring, Hobbiton is overrun with up to 15,000 lambs.

“Shearing sheep was really fun, but it was surreal having tea time at the Green Dragon Inn,” Gutierrez exclaimed. In the movies, the Green Dragon Inn was the meeting place for all residents of Hobbiton.

Be prepared for wet weather!

Winter in New Zealand can be wet. It is common to see gum boots lined up in doorways of businesses and classrooms. Gutierrez described a freak rainstorm that dumped 100 mm of rain and flooded houses.

“Mud was everywhere,” she said. “When I was staying at a Simmental stud farm, we got a side-by-side stuck in the mud and had to hike three miles out of the hills. We were covered in mud!”

Gutierrez capped off her New Zealand visit with a ski trip. She stayed in a hostel and met people her age from around the world.

After she graduates in May, Gutierrez plans to take a gap year and apply for admittance to vet school for fall 2019. In the long term, she wants to use her skills and knowledge to help farmers in third world countries improve animal health to increase food security.

It’s a small world

Gutierrez said she hopes her story inspires students in animal sciences to get out and look around for opportunities. Networking is global and is very important. “There were people in New Zealand who know Dr. Holly Neibergs,” she said. “Wow! That’s my professor!”
ALEXA VALDEZ has always been horse crazy. She took riding lessons whenever she could and bought her first horse, Jack, when she was 11 years old. When she was a high school student she taught horsemanship to young campers at the Royal Ridges Retreat summer camp in southwestern Washington. She also co-directed the winter internship program at the same facility and taught horsemanship. Valdez supervised a crew of teenage youth who cleaned stalls and exercised the horses during the off-season. She also participated in 4-H, was a member of the Clark County Fair Court, and competed in Washington High School Equestrian Teams and local gaming shows.

BUILDING HER RESUMÉ

Since starting her studies at WSU, Valdez has been active in Dairy Club, the National Society of Leadership and Success, Pre-Vet Club, and the College of Agriculture, Human, and Natural Resource Sciences Student Senate. She is working with a group of students to resurrect the WSU chapter of Collegiate Horsemen’s Association and serves as president. The group has hosted guest speakers at meetings, volunteered at the Whitman County 4-H Horse and Field Day, learned how wheat was harvested with horses at the annual Palouse Empire Threshing Bee, and attended a horsemanship clinic in Pasco.

Valdez said she hopes to study veterinary medicine after graduating in May 2019. To affirm her career choice and gain more experience, Valdez observed and shadowed veterinarians specializing in companion animal, equine/sports medicine, and livestock medicine. Last summer she was one of only six people chosen nationally to participate in a prestigious internship at the Kentucky Equine Sports Medicine and Rehabilitation Center in Versailles, Kentucky.

The program wasn’t as medically focused as she thought it would be. “No one on the KESMARC staff is a veterinarian,” Valdez explained.

“There is a huge variety of need in the equine world for therapy,” she said. Although she didn’t get her hands dirty performing surgeries or other complicated medical procedures, the internship gave her a sound understanding of equine rehabilitation protocols and allowed her to interact with some of the best vets in the field.

KESMARC’s client list includes some of the most renowned horse owners and trainers who bring elite equine athletes to the facility for treatment with state-of-the-art rehabilitation equipment and procedures. Valdez helped keep the barn neat and clean, brushed and bathed the horses, monitored health, took temperatures, and assisted veterinarians, farriers and therapists. She brought horses for treatment to the facility’s vibrating platforms, swimming pools, Aquatreds, which are underwater treadmills, and the hyperbaric chamber. Therapy with this type of equipment is designed for preventive care, enhanced healing and recovery, and improved athletic performance.

OUT AND ABOUT IN THE BEAUTIFUL KENTUCKY BLUEGRASS

During her free time in Kentucky, Valdez visited the Keeneland Race Course, observed famous Thoroughbred breeding farms, and visited the Kentucky Horse Park where she assisted at Breyerfest, the biggest model horse event of the year, and attended a show-jumping competition. She also shadowed an equine chiropractor who treated horses at Windstar, Derby Dan, and Darley farms.

This summer the Vancouver native plans to participate in a research internship at the Oregon Zoo in Portland, work on her vet school application, volunteer for the Clark County Fair Court, spend time with her horse, and maybe even train a few dogs.
WHEN CHEF JAMIE CALLISON wants to impress at his Cougar Football tailgate dinners, he brings out his best: Student-crafted, locally made foods that tell the story of Washington State University.

Near the top of the list are delectable cuts of WSU Premium Wagyu beef from Cougar Quality Meats, a working butcher shop and meat science lab where students in the Department of Animal Sciences learn the science and craft of great meats.

“I’ve never had a better cut of beef in my entire career,” said Callison, Executive Chef in the School of Hospitality and Business Management. Chefs from Japan and Europe tell him the same thing: “There is no better beef.”

When it’s time to season such a prime cut, Callison keeps it local and turns to Cougar Seasonings and Rubs, the retail collection of spice blends he and his wife Tonya designed personally with WSU Premium beef in mind.

“With all their marbling and rich flavor, why would you want to hide that?” he said. “You want to showcase the meat, and sometimes, enhance it. It’s like a happy marriage.”

That perfect marriage grew even closer this year, when the Callisons donated their Cougar Seasonings retail business to the Department of Animal Sciences. Sales of the spice blends now benefit WSU students. Every shaker sold helps students gain valuable career experience at Cougar Quality Meats, and enhances training programs at the WSU Meats Lab.

“This is a win for everyone,” said Dr. Jan Busboom, WSU Extension Meats Specialist and advisor to Meats Lab students. “Jamie and Tonya’s gift is an amazing way for us to give students more and better learning experiences.”

A PRIME PARTNERSHIP

In 2007, the Callisons founded what was then called “Rival Rubs” out of a rented storefront in Uniontown. They did all of the work themselves, creating spice blends branded for nine different universities, packaging them in metal cans, shipping them and drumming up retail buyers.

“As our company grew, we were hard pressed to keep up with demand,” he said. “We worked until early morning, then got up and went to our regular jobs. It got to be too much.”

To handle demand, they began working with Shelley Milligan, owner of S.A. Milligan Co., Inc., an Auburn-based spice wholesaler. She maintained the same great quality that their customers had come to expect.

The business thrived, but after 10 years the Callisons were ready to pass it on.

“We really thought about who would benefit most,” he said.

At the same time, Callison had developed a 10-year relationship with Busboom and the Department of Animal Sciences.

He took part in one of WSU Animal Sciences’ first “Beef 300” courses, joining cattle ranchers and small beef producers to learn industry essentials, from genetics and nutrition to the demands of professional chefs.

“We got to know each other, and I put Jamie on the program as our resident chef,” Busboom said. “He
was a natural fit – Jamie has a tremendous interest in understanding top quality beef production, from farm to table.”

Traveling with WSU researchers, Callison saw firsthand the value of their outreach.

“They create amazing opportunities for farmers and ranchers to do a better job at what they’re already doing,” he said. “And, through Cougar Quality Meats, they’re creating openings for students so that when they begin their careers, they’ve already made a difference.”

A teacher himself, Callison knows the importance of on-the-job learning.

“Doing something that benefits our students—that’s where my heart is,” he said.

With such a wide impact, Animal Sciences was a natural fit for the Callisons’ donation.

Along with seasonings and rubs recipes, they gifted the finished product as well as retail relationships—essentially, a standalone business. Milligan, the spice wholesaler, also chipped in, donating a $1,500 start-up package.

“She really believed in the product and wanted to help both Tonya and I and the school,” Callison said.

“The Callisons and I have been a great team, and we’ve created great products,” Milligan said. “I am happy to help the school, any way I can.”

**Center of Quality**

Just down the lane from fields where cattle graze sits the WSU Meats Lab, a brick building with rooms dedicated to every part of meat science. It’s home to Cougar Quality Meats: a training center for future leaders in agriculture, business, and the food supply.

“There is tremendous demand for students with hands-on experience, especially if they go on to the food safety field,” said Busboom.

Learning safe meat handling is doubly critical because the Meats Lab is one of the few facilities in the state where small farmers can harvest meat under U.S. Department of Agriculture inspection, allowing them to sell commercially.

“No one else locally does that,” he said. “We’re a vital link between small growers and their customers.”

The lab employs a small staff of students who learn how to safely harvest, process, and sell quality meat, including bacon, Cougar Smokies, steaks, roasts, and whole carcasses. Most meat processed comes from WSU-owned livestock, including the prized Angus and Wagyu herds.

“Our emphasis is on quality,” Busboom said. “People tell me that we have the best sausages and steaks they’ve ever had.”

**Purchase Cougar Seasonings**

Cougar Seasonings are available at Cougar Quality Meats and Ferdinand’s Ice Cream Shoppe on the WSU campus; WSU Connections stores in Everett, Spokane, and Pullman; Dissmores IGA and Crimson & Gray in Pullman; the Dahmen Barn in Uniontown; online at the WSU Connections Store; or by emailing Angela Reitmeier at angela.reitmeier@wsu.edu.

Sales have been strong so far, and the department plans to develop a retail case and expanded counter at Cougar Quality Meats. Proceeds will ensure the program stays cutting-edge, increasing student involvement through employment, class visits, and research.
THE WASHINGTON STATE SHEEP PRODUCERS presented Dr. Jan Busboom with the 2017 Golden Sheep Hook Award in October. This award recognizes outstanding service to the sheep industry and is the highest honor presented by the organization.

Busboom grew up in the sheep industry. Alongside his father, he raised and showed sheep. Together they earned a national reputation as top-quality Columbia sheep breeders. He continued his passion for animal agriculture by pursuing a degree in animal science and eventually received a PhD from Michigan State University.

Busboom came to WSU in 1989 as the Extension meat specialist in the Department of Animal Sciences. He quickly became a valuable asset to the world of academia, Extension, and the sheep industry in Washington. He combined his interest in meat muscle mass and sheep while researching the callipyge gene, which influences muscling in the loin and buttocks of sheep.

He has always been eager to help with Extension outreach programs. He is the WSU Meat Evaluation and Analysis Team (MEAT) team leader for the LAMB 100, 200, and 300 education programs and has been instrumental in delivering these courses to audiences in Washington, Oregon, California, and the Rocky Mountain region.

A POSITIVE MENTOR

Busboom’s positive attitude makes him a delightful asset on any team project or in any mentoring capacity. Countless graduate students have sought his guidance in their endeavors and have risen to exciting new heights under his tutelage. He truly is a knowledgeable meat scientist who has been researching and mentoring budding academics for the past 25 years.

His calm demeanor and steady personality make him easy to work with. He excels in mentoring youth as a tireless and dedicated 4-H leader. He and his wife, Janice, manage a flock of Suffolk x Hampshire crossbred sheep and lead the Albion 4-H Sheep Club.

For many years he has been involved in the annual Northwest Junior Sheep Expo and has represented the university professionally by sharing knowledge on carcass and meat qualities.

Busboom believes in education and is a great advocate for the sheep industry, research, and Extension. He serves as a team member on the WSU Sheep Endowment ram management study, analyzing reproductive fitness of breeding stock. He is working with a group to create a Spanish resource guide for sheep herders. This will not only enhance the quality of care that commercial range sheep flocks receive, but it will also better the lives of the people working with them. He will team up with others at the University of Idaho and train ultrasound technicians specializing in sheep evaluation in the summer of 2018.

Retiring soon

In September 2018 Busboom will retire from WSU, but he said he will remain passionate about education, meat science, genetic improvements, youth, mentoring, research, and the sheep industry.
SUMMER SCHOOL was short, but eventful for 13 students last May. For two weeks, they went to class everyday somewhere in Costa Rica. For many of the students, this trip fulfilled their dreams to travel and study abroad. One student had a specific reason for going.

“There was also talk about the possibility of riding a water buffalo, and that was a big selling factor for me,” senior animal sciences student Marcy Bartelheimer said.

The educational experience of a lifetime was organized by Dr. Martin Maquivar, an assistant professor in the department. He used his connections in the South American country to organize visits to different types of animal production facilities.

“I wanted the students to learn how animal production systems in Costa Rica are different from those in the United States,” Maquivar said.

Traveling to their destinations was a daily adventure. Traffic and rural roads were a nightmare said Angela Reitmeier, an instructor in animal sciences who also accompanied the group and was driver of the “giddy-up bus.” She and Maquivar drove the students to local farms where they toured facilities and visited with dairy cattle, beef cattle, pig, rabbit, goat, sheep, poultry, and even crocodile producers.

Each night the group met and discussed what they saw, heard, and discovered that day. After touring a dairy and milk processing plant, the students learned that most milk is evaporated into powder to reduce spoilage losses because of the warm climate. They also learned that many of the feeds and forages, animal breeds, and facilities of other production systems were unfamiliar, but reflected what was available and adapted to the region. Management practices were designed to create a green economy and reflected Costa Rica’s attempt to live pura vida (pure life) and to become the first carbon-neutral country.

Maquivar is organizing a similar trip to Costa Rica again this summer. Two students who went on last year’s adventure shared advice and thoughts on some of their experiences for those who might want to participate this year.

“First of all, just go,” Bartelheimer said. “While you are there, explore and experience things that may be outside of your comfort zone. If you have the chance to stay after the program to explore on your own, you should take advantage of that opportunity!”

“Finances were an issue for me, but WSU and CAHNRS have plenty of scholarships to help offset the costs of the trip,” said Janelle Thomas, a senior animal sciences student who came to WSU from Nevada. “My most memorable experience was holding a 14-day-old lamb. I had never held such a young animal before and it quite literally made me burst into tears. I couldn’t believe where I was, who I was surrounded by, and I was overwhelmed with disbelief!”
Flocks of birds flying in unison create mesmerizing aerial displays, but many of them are pests to dairy farmers. Wild birds, particularly starlings, tend to roost on or near dairies in Washington. This is a concern for many dairy producers because birds consume cattle feed, spread pathogens to the cattle, and can cause structural damage to buildings. Damage caused by wild birds costs Washington dairy producers from $1,000 to $200,000 a year.

My research is focused on quantifying cattle feed losses due to bird consumption as well as understanding which pathogens are being carried by birds. In addition, I am examining potential behavioral interactions between cattle and wild birds to determine if the birds affect cattle feeding behaviors and overall well-being.

I want to thank undergraduate animal sciences students Kim Cirillo, Youssef Tantawy, Chris Mandella, Hannah Cameron, and Isabella Duarte for all of their help collecting and analyzing data.
## Graduate Students

### Research Area

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<thead>
<tr>
<th>Behavior &amp; Well-Being</th>
<th>Students (Degree, Advisor)</th>
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<tbody>
<tr>
<td>Research is focused on identifying environmental and genetic contributions to the health and well-being of animals.</td>
<td>Tyler Caskin (MS, Adams Progar), Briah Parchment (MS, Adams Progar)</td>
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<tr>
<th>Environmental Sustainability/Nutrition</th>
<th>Students (Degree, Advisor)</th>
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<td>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. This work includes animal metabolism, energy nutrition, and utilization of by-product feedstuffs.</td>
<td>Hannah Chiapetta (MS, Harrison), Maria Donnay (MS, Johnson), Erin Mackey (MS, Harrison), James Wolf (MS, Llewellyn)</td>
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<th>Genetics/Genomics</th>
<th>Students (Degree, Advisor)</th>
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<td>Research projects focus on the use of mammalian comparative and functional genomics in the search for genes of economic significance. Transcriptome analyses are also employed to understand the biochemical, cellular, physiological and environmental systems involved in complex phenotypes.</td>
<td>Justine Galliou (MS, Neibergs), Logan Hulst (MS, Neibergs), Kayleen Oliver (MS, Neibergs), Shuwen Zhang (PhD, Jiang)</td>
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<th>Growth/Muscle/Meat Science</th>
<th>Students (Degree, Advisor)</th>
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<td>Projects span the continuum from basic to applied research and include defining the molecular mechanisms of muscle development, physiological responses to growth regulators, and meat quality improvement.</td>
<td>Xiangdong Liu (PhD, Du), Noe Gomez (PhD, Du), Natasha Moffitt-Hemmer (MS, Busboom), Junseok Son (PhD, Du), Qiyu Tian (PhD, Du), Liang Zhao (PhD, Du)</td>
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<th>Reproductive Biology/Physiology</th>
<th>Students (Degree, Advisor)</th>
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<td>Research in reproductive biology/physiology includes endocrinology and embryo development that is both basic and applied, using cattle, sheep, swine, and rodent models.</td>
<td>Richard Griffiths (MS, Pru), Katriana Jorgensen-Muga (MS, Pru), Meagan Stotts (MS, Maquivar)</td>
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### James Wolf: Focus on Graduate student research

Hometown: Pierre, South Dakota  
Degree: Master of Science  
Major professor: Don Llewellyn

Feed costs represent a large percentage of the total operating costs of dairy and beef cattle production. One way to reduce feed costs is by incorporating ingredients grown locally. Producers in the Pacific Northwest may add triticale silage to their feeding programs. Dry matter intake and feeding value of triticale silage may be slightly lower than other cereal-grain silages.

I am working with Dr. Don Llewellyn, a regional livestock specialist in the Department of Animal Sciences, and Dr. Steve Fransen, a forage research agronomist and Extension specialist in the Department of Crop Sciences at WSU, to improve the feeding value of triticale silage by intercropping it with barley. Triticale will support overall yield of the crop and the barley will improve nutrient quality and palatability. We are using test plots in Moses Lake to grow the crop and determine the intercropping ratio of barley:triticale that optimizes yield and nutrient quality. The first year’s analyses are underway, and we are gearing up to replicate the experiment soon.
AFTER 33 YEARS OF SERVICE to the Department of Animal Sciences and WSU, Dr. Mark Nelson retired in January 2018. He provided quality learning experiences for students, used practical research approaches to solve issues facing the livestock industry, and effectively communicated those solutions. Nelson was dedicated to mentoring the next generation of animal scientists. During his tenure at WSU, he had 18 graduate students and served on another 22 graduate student committees.

Over the course of his career at WSU, Nelson taught part or all of 22 different courses. His teaching philosophy was fluid and used different models to meet the needs of a wide variety of learners. Students routinely ranked his classes and performance as an instructor as outstanding and above average. In fact, his enthusiasm for teaching animal science courses often inspired students. In a recent letter of support, a former student said, “To this day, it [Feeds and Feeding] remains one of my favorite classes and is the defining moment of my goal to become a nutritionist and a teacher.”

Nelson’s teaching extended beyond the classroom. He routinely involved students in his research projects and Extension programs, mentored students through honors research projects and independent studies, and served as the advisor of Cougar Cattle Feeders, an experiential learning cooperative in which students learn about feedlot management by procuring, developing and applying feeding and health protocols, and marketing cattle. Nelson also served as the faculty coordinator for the WSU Feed Plant.

His excellence in undergraduate education and advising has not gone unrecognized. The WSU Interfraternity Council and Panhellenic Association named him an Outstanding Faculty Advisor in 2003. The WSU College of Agriculture, Human, and Natural Resource Sciences presented him with the Excellence in Advising Award in 2003, the R.M. Wade Award for Teaching Excellence in 2015, and the Land Grant Mission Award in 2017, which recognized his proficient integration of teaching, research, and Extension programs. Furthermore, the Western Section of the American Society of Animal Science bestowed him with the Distinguished Teaching Award in 2016.

As a ruminant nutritionist, Nelson has made significant contributions to the beef cattle industry. He determined that potato by- and co-products could be fed to cattle without affecting performance or meat quality. He led a multi-disciplinary team that developed ensiling and biosecurity protocols to minimize contamination of potato products with the parasite that causes bovine cysticercosis (beef measles), a zoonotic disease with severe economic impact on the beef and potato production industries. Adoption of these research-driven recommendations has virtually eliminated beef measles in Washington and Alberta, Canada.

Nelson’s collaboration with crop scientists was instrumental in development of new barley varieties and recommendations for planting and incorporation in pig and cattle diets. Recent research in Nelson’s lab has focused on altering the dynamics of ruminal fermentation and fetal programming to improve beef quality and increase the functional food aspects of beef.

Nelson’s retirement is well-deserved. His dedication to student learning and his contributions to core departmental courses, research, and Extension were immense and his departure has left an enormous hole to fill!

Faculty News

Min Du received the American Society of Animal Science Award in Animal Growth and Development.

The American Physiological Society presented Min Du with the Distinguished Award in the Physiological Genomics Group.

Larry Fox won the Purina Animal Nutrition Award from the American Society of Dairy Science.

The Golden Sheep Hook Award was presented to Jan Busboom by the Washington Sheep Producers.

Susan Kerr’s communications were recognized at the national (4) and regional (3) levels by the National Association of Country Agriculture Agents.

Mark Nelson won the CAHNRS Land Grant Mission Award.

Staff News

Ferris Forar retired after 42 years of service to the WSU Knott Dairy Center.
Departmental news

THE ADVENTURE BEGINS....

D R. LAWRENCE FOX has contributed significantly to the education of students interested in dairy management and production throughout his career. His efforts recently were recognized by the American Dairy Science Association, who gave him the Purina Animal Nutrition Teaching Award. His research program, which primarily focused on mastitis prevention and abatement, has led to management practice changes in the milking parlor.

He has had a very successful career, but unfortunately for WSU, Fox is retiring in March after 32 years of service.

Fox was a popular instructor in the Department of Animal Sciences, teaching three core courses in dairy science. He taught an introductory dairy management class, linking classroom instruction with hands-on dairy instruction, to students with non-agricultural backgrounds. He coordinated a senior-level dairy production course taught by individuals from WSU and the University of Idaho, which incorporated new scientific discoveries to explain the physiology behind dairy production and management practices used to optimize milk production. He also taught an advanced dairy management class in which students learned how to evaluate dairy enterprises. This course changed significantly over time to reflect advances in technology and changes in dairy production efficiencies, especially in response to the advent of the North American Intercollegiate Dairy Challenge program. Students learned to evaluate the strengths and weaknesses of a dairy’s management and production practices on a broader scale and focus on improving dairy production efficiency. Over the last 15 years, Fox has co-coached four teams who have earned Platinum honors at the NAIDC.

Fox also contributed to a junior-level course in agricultural and food systems and taught Animal Science and Society, a course focusing on how animal agriculture impacts and integrates with modern society. In addition, he has been a dedicated advisor for Dairy Club, one of the more active clubs on campus.

For the last eight years Fox taught a one-week block on mammary gland health, milk quality and milking at the U.S. Dairy Educational Consortium, a multi-university collaboration created to meet the educational needs of students from institutions that do not have complete dairy science programs.

Much of Fox’s research, based out of the Field Disease Investigation Unit, a joint venture between the Colleges of Veterinary Medicine and Agricultural, Human & Natural Resource Sciences, has focused on management practices that prevent and control mastitis, one of the costliest diseases facing the dairy industry. In some of his early work, Fox determined that laundered cloth towels were less expensive and just as effective in mammary gland preparation for milking and that teats must be treated with well-formulated dips and blotted dry after milking to prevent mastitis in inclement weather. He further developed alternative dry cow therapy methods to decrease dry periods. More recent work focused on epidemiology and control of mycoplasmas, highly contagious pathogens that cause severe outbreaks of mastitis in herds. Fox and his group have created methods improving diagnosis and identification of the most common mycoplasma species and modes or routes of transmission, paving the way to control and prevent outbreaks of mycoplasma mastitis.

Fox maintained an active research program throughout his tenure at WSU. He also contributed to the education of hundreds of undergraduate dairy students and mentored over 20 graduate students, many of whom have become leaders in the dairy industry. Dairy education at WSU will not be the same, but we wish him well in his well-deserved retirement.

Roger Collins retired after spending 32 years at the Beef Center.

After 24 years as manager of Knott Dairy Center John Swain transitioned to instructor of dairy management classes and the AI & Pregnancy Check class, and coach of the Dairy Challenge teams.

Student News

Chris Mandella was elected national president of the student affiliate division of the ADSA.

The WSU Quiz Bowl team (Chris Mandella, Marcy Bartelheimer, Nicole Buell, Farrah O’Hara and Melissa Rauch) placed fifth in the competition at the ADSA conference in June.

Other News

The department won the Big Scoop Ice Cream Competition at the ASAS national meeting for the third year in a row.
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Often, life-changing opportunities happen because of a single gift. A student gains from an experience or succeeds because of a scholarship. A faculty member makes a ground-breaking discovery because of generous contributions. A simple thing, really. Making a gift. Changing a life. If you would like to help us achieve our goals, please consider making a gift to the Department of Animal Sciences.

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