animal & range sciences newsletter

Summer 2017 • Volume 10, Issue 1

From the Department Head

Happy summer! As another spring semester has ended and students begin transitioning into the next phase of their lives, we look back on the many accomplishments of the Animal & Range Sciences department.

Dr. Patrick Hatfield
Department Head

As of the 2017 spring semester enrollment, we had 20 MS and nine PhD students. The undergraduate student enrollment includes 94 Livestock Management/Industry option, 92 Science option, 81 Equine option, 44 Wildlife Habitat Ecology option, 37 Rangeland Ecology/ Management option and 6 Sustainable-Livestock Production. We certainly are growing!

In fact, for the 2016-2017 academic year, 74 students graduated from our department. These graduates are going on to a number of different careers with companies such as CHS Nutrition, Cargill Beef, Montana FFA Foundation, Synergy Resource Solutions, Edmundson Cattle Company, Holden Herefords, Sleeping Giant Genetics and Green Mountain Red Angus, just to name a few.

At our spring graduation we honored two outstanding graduates, Mariah Young and Isaac Strafstrom. Both Mariah and Isaac graduated with degrees in Animal Science and from the Honors program Summa Cum Laude. Mariah has been accepted to the 1 + 3 vet program where she will spend her first year of vet school at MSU before going on the WSU to complete her studies in Veterinary Medicine. Isaac is heading to the Wind River Range in Wyoming for the summer to be a rider for a grazing association.

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In This Issue

From the Department Head

Congratulations to our department Administrative Team for winning Pure Gold! You can see their story on page 12. Or, visit http://animalrange.montana.edu/news/index.html to see the full write up.

A summary of a 2014-2016 report to the VP of Research includes teaching, extension, and research provided insightful information. Our extension faculty, along with outreach from faculty not having extension appointments, logged more than 900 hours of contact time between 2014 and 2016 reaching close to 19,000 Montanans. This does not take into account emails, phone conversations, web activities, outreach publications, and logging lots of travel miles, just to name a few. On the on-campus teaching side, the most recent calculation from 2015 shows our department taught 199 credits of course work. This is 19 credits/teaching FTE. The average teaching evaluation was 4.5/5.0 with 1,837 students surveyed.

From 2014 to 2016 our faculty had 69 peer reviewed publications when counted by the whole department and 125 peer reviewed publications when counted by individual faculty member (i.e. multiple authors from within the department). In addition our faculty also wrote:

- 4 book chapters
- 43 extension publications
- 60 proceedings/abstracts
- 3 eXtension technology transfer formats
- 135 media contributions, 105 popular press releases
- 218 “other” scientific presentations
- 152 state, regional, national and international professional service activities
- 25 faculty recognitions, honors, and awards

Also, our faculty secured 89 new grants to support research, teaching, and extension activities totaling $8,041,499.


rendering of the Agricultural Teaching Arena Complex

Our department is also working with the MSU alumni foundation on two new exciting opportunities. The first is the MSU Agriculture Teaching Arena Complex. This multi-faceted facility will help us maintain and grow our quality programs with an ever increasing student enrollment. Additionally, it will increase our capacity for a broader base of student and community engagement and experiential learning. The second is our proposed ranch management program’s mission to sustain and preserve the agricultural heritage of the Northern Great Plains and Intermountain West by graduating students who have the breadth of knowledge and diversity of skills needed to employ prudent ranching practices that create value and improve the natural resources vital to our land.

Sadly this spring we are saying good bye to a number of our department team including Whit Stewart, our extension sheep specialist, who is taking a position at University of Wyoming. Lisa White, our accountant, is moving the Salmon Idaho and our lab manager Phil Merta will be the MSU Biosafety Officer. On our Livestock management crew Jake Heen is moving back to the family operation in North Dakota, Bill Bennett is retiring after 35 years and John Peebles is going home to work on his family ranch in Choteau.

On a positive note, because our student numbers are increasing and the demand for courses is great, we will begin the search for a new position in our equine science option.

Feel free to contact me with any questions or comments at (406) 994-4850 or Hatfield@montana.edu.

In the News

Forty of Montana State University's top seniors and their faculty and staff mentors were recognized Tuesday, Feb. 21, at the 35th annual Awards for Excellence banquet held on the MSU campus. The banquet was co-hosted by the MSU Alumni Foundation and the Bozeman Area Chamber of Commerce Honored students are nominated by faculty in their college or department. Qualified seniors must have at least a 3.5 grade point average as well as demonstrated campus leadership and community service. The honored students each select a mentor who will be recognized with them at the event.

The 2017 Excellence Award winners and their mentors from the College of Agriculture are:

- Kaitlyn Goroski, agricultural education and animal science, Wibaux; Shannon Arnold
- Connor Mertz, environmental sciences soil and water, Kutztown, Pennsylvania; Tony Hartshorn
- Alyssa Riley, animal science and preveterinary medicine, Volborg; Rebecca Mattix
- **Isaac Stafstrom**, science livestock management and industry, Madison, Wisconsin; **Patrick Hatfield**
- **Mariah Young**, animal science and preveterinary medicine, Belgrade; **Jane Ann Boles**.

Isaac Stafstrom said, "Dr. Hatfield has made it possible to for me to pursue exhilarating coursework and challenging opportunities. Engaged with advising, teaching, research, and extension work, he models the diverse responsibilities of a professor at a land-grant institution with balance and wisdom."

Mariah Young said, "Jane Ann is always an amazing help and inspiration. As a professor, mentor, and academic advisor, she consistently goes above and beyond in every aspect. She is an exemplary model to follow and well-deserving of this prestigious award."

Front row left to right: Dr. Jane Ann Boles (Animal and Range Sciences), Kaitlyn Goroski, Mariah Young, Alyssa Riley, Dr. Charles Boyer (Vice President of Agriculture) Second row: Isaac Stafstrom, Dr. Patrick Hatfield (Department Head, Animal and Range Sciences), Dr. Rebecca Mattix (Teaching Professor, Microbiology & Immunology). Third row Dr. Shannon Arnold (Agricultural Education), Connor Mertz, Dr. Tony Hartshorn (Environmental Sciences Soil & Water)

Montana State University doctoral student **Elizabeth Flesch** has co-authored a paper that compares the mountain goat data that volunteers collected to data career scientists collected and confirms the importance of citizen scientists in mountain goat research. Elizabeth is an interdepartmental graduate student in MSU's Department of Animal and Range Sciences in the College of Agriculture and Department of Ecology in the College of Letters and Science. The paper, "Comparing citizen science and professional data to evaluate extrapolated mountain goat distribution models," was published Feb. 14 in the ecology journal Ecosphere. The study focuses on Glacier National Park's High Country Citizen Science Project, which enlists volunteers to act as citizen scientists by participating in backcountry surveys to collect information on the number and location of the park's mountain goats. The paper details how, through their data collection, citizen scientists have played an important role in mountain goat distribution research in Glacier National Park as part of the study that spanned Waterton-Glacier International Peace Park.

Photo by Adrian Sanchez-Gonzalez
Adapted from story by Denise Hoepfner

In the News

Dr. Shannon Moreaux DVM, right, associate professor in MSU's Department of Animal and Range Sciences prepares to rope a steer while riding a mustang.

Isaac Johnson, a Montana State University student, prepares a mustang for riding with a round of groundwork and horsemanship flags.

Levi Johnson, a Montana State University student, prepares a mustang for riding with a round of groundwork and horsemanship flags.

Nine wild mustangs stepped foot onto Montana State University's Agricultural Research and Teaching Farm virtually untouched, hailing from Bureau of Land Management facilities in Burns, Oregon, then were adopted by the Montana nonprofit, Heroes and Horses, to ultimately be used for therapeutic mountain pack trips with combat veterans.

Heroes and Horses is a program that uses horses and the remote wilderness to challenge and inspire combat veterans suffering from post-traumatic stress disorder. The veterans learn horsemanship skills and wilderness survival, then embark on progressive, multi-day horse pack trips in order to overcome their difficulties and replace devastating memories with positive ones.

A handful of MSU students, with the help of local trainers and volunteers, assisted in gentling and training the adopted wild horses over the course of nearly 90 days as the first step in helping these horses transition into a life of mountain adventure. "The horses trained by MSU students, faculty and staff will ultimately serve as tools to teach military veterans new skills to start a post-military life," said **Dr. Shannon Moreaux**, DVM and an associate professor of equine science in MSU's Department of Animal and Range Sciences in the College of Agriculture.

"By using BLM feral horses for this service learning project, we are also providing a far-reaching service," Moreaux said. "The horses will be uniquely repurposed and will have a better life than living in a long-term holding facility; we will have provided a significant amount of publicity for the BLM Wild Horse adoption program. And, ultimately, we save taxpayer money while helping to protect sensitive ecosystems from overpopulation."

"I believe in the Heroes and Horses program," Moreaux said. "It is important we honor the men and women who have suffered in foreign wars by ensuring they can reintegrate into a nonmilitary society." And, Moreaux said, it is important for students to participate in these types of service learning opportunities."Service learning is an educational application that integrates knowledge transfer with a social need," he said. "Service learning enriches the learning experience, teaches civic responsibility and strengthens communities."

Photos by Adrian Sanchez-Gonzalez
Story by Jessianne Wright

In the News

Photo by Adrian Sanchez-Gonzalez
Story by Jenny Lavey

Montana State University Assistant Professor of Rangeland Ecology **Craig Carr** has received the Range Science Education Council's 2017 Early Career Undergraduate Teaching award.

Carr, who is also the MSU College of Agriculture's undergraduate range management team faculty adviser, received the award at the Society for Range Management's annual meeting, held in St. George, Utah, in February.

"We're very proud of Dr. Carr and applaud his dedication and passion for teaching range management at MSU," said Patrick Hatfield, department head of the Animal and Range Sciences Department, which is in the College of Agriculture. "MSU is lucky to have faculty like him--who engage deeply in the classroom, while encouraging students to challenge themselves outside of the classroom."

The purpose of the award is to recognize excellence in teaching and advising range management students at the undergraduate level by faculty or instructors who are in the early stages--those with less than 10 years of experience--of their teaching careers.

"This award was really an honor for me," Carr said. "To be recognized by my peers for doing something that I truly enjoy and to read the various statements of support for my nomination was humbling. Teaching for me is a passion and the interactions with my students are often the highlights of my day. There is no better feeling than presenting a good lecture, seeing a student grasp a challenging concept or assisting students as they work through difficult situations. This award has special meaning to me as I have been involved in the Society for Range Management since I was an undergraduate student over 20 years ago. I have admired many of the past teaching award winners and feel privileged to be considered in the same class."

A team of Montana State University researchers, stakeholders and community partners known as the Montana Beef to School Project wrote a case study report to help Montana beef producers, meat processors, schools and communities explore what factors make beef to school programs successful and encourage the use of local beef in every Montana school.

Montana has just over one million residents, approximately 2.5 million cattle, thousands of beef producers, approximately 20 state and federally inspected beef processors and about 145,000 students across 821 schools. "Producers and processors seem very open to working with schools and expressed pride in the quality of products and services they could offer," said **Tommy Bass**, co-principal investigator of the Montana Beef to School Project and MSU Extension livestock environment associate specialist. "While a variety of local beef supply chain models were documented in the case study, all included community values, trust and economic potential as key to beef to school partnerships."

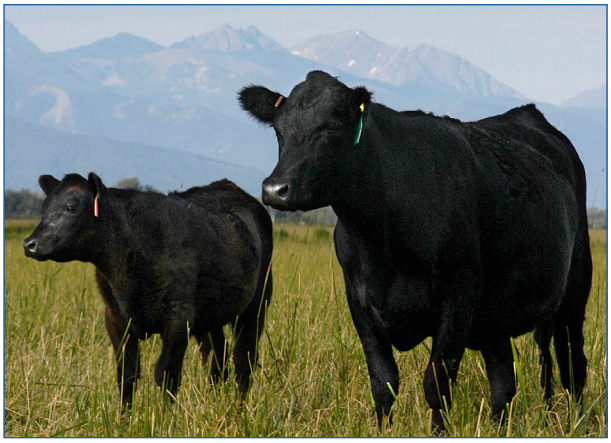


Photo by Kelly Gorham
Adapted from story by MSU News Service

The Montana Beef to School Project is a three-year collaborative project between several Montana beef producers and processors, schools and many stakeholders represented in the Montana Beef to School Coalition. It is funded by a $220,000 grant from the U.S. Department of Agriculture's Western Region Sustainable Agriculture Research and Education Program.

The report, "Moooooving Forward Together: Strategies for Montana Beef to School," can be downloaded at http://www.montana.edu/mt-farmtoschool/beeftoschool.html.

In the News

On September 21, 2016 a new type of training exercise was implemented in Choteau County targeting a wide range of community stakeholders, from first responders and public health/sanitarians to livestock producers and truck drivers. This training outlined what to do in the traumatic and very real event of a vehicular crash involving a cattle truck. MSU Extension's Department of Animal and Range Science's agro-emergency projects coordinator, **Jeanne Rankin** assisted in the creation and implementation of this session. She and other coordinators stressed the importance of relaxation and calm when dealing with animals, especially in emergency situations.

Cattle, provided by Jacobs Livestock and Rodeo, were used to safely demonstrate evacuation and holding prior to relocation as well as protocols concerning treatment of terminal animals with the assistance of a veterinarian. Rankin states that, "Choteau County is so forward-thinking and [has] had such a great response from other counties", hopefully this attitude can continue in order to ensure the safety of people and animals in future situations like these statewide. Huge thanks to all the sponsors of this exercise, the Montana Beef Council, Montana State University Extension, Chouteau County Office of Emergency Management and Chouteau County Public Health.

The Agro-Emergency Program at MSU provides research-based consultations, trainings, and exercises on disasters and emergencies involving or impacting agriculture, food, and natural resources, and Montana communities. Events are funded by MSU Extension, with additional support of industry stakeholders, and competitive grant funding. For more information contact Jeanne Rankin, DVM (jeanne.rankin@montana.edu) or **Tommy Bass** (tmbass@montana.edu), Department of Animal and Range Sciences Extension.

By **Virginia Holst**, MSU Agricultural Education Program
Adapted from original content by Bethany Monroe DeBorde, River Press
DeBorde, B. M. (2016, September 28). *Chouteau County prepares for Rolling Cows*. River Press [Fort Benton, MT], p. 4.

Thanks in large part to Montana State University's local food purchasing program known as Farm to Campus, the university now buys more than 20 percent of its food products locally, according to university officials.

In fiscal year 2016, MSU's Farm to Campus purchases totaled more than $1.5 million, or 22.4 percent of the university's total food purchases, according to Kara Landolfi, Farm to Campus coordinator. That percentage is expected to increase by the end of fiscal year 2017, she added.

One of the program's most recent examples of investing in local food is the purchase of 30 lambs both raised and finished for slaughter by the MSU College of Agriculture's Department of Animal and Range Sciences. In March, MSU Culinary Services – which houses the university's Farm to Campus program – partnered with the department to purchase the animals. The meat, which was processed at Pioneer Meats in Big Timber, is likely to be used by the end of the semester, Landolfi said. Culinary Services serves food in MSU's dining halls and Strand Union Building retail operations, as well as through University Catering and concessions. MSU Farm to Campus was formerly known as Montana Made.

Photo by Adrian Sanchez-Gonzalez

"As the largest university food service operator in the state of Montana, MSU Culinary Services is in a unique position to leverage their buying volumes with local producers to provide them with reliable demand for their products," Landolfi said.

The recent partnership between Culinary Services and the Department of Animal and Range Sciences blossomed from an initial collaboration with MSU's Steer-A-Year program, according to Landolfi.

Story by MSU News Service

In the News

Through Steer-A-Year, last fall Culinary Services purchased and served meat from nine steers that MSU students had raised. Landolfi said that she expects Culinary Services to purchase approximately 30 Steer-A-Year program steers this summer, and all of that beef is estimated to be consumed within the fall semester.

Tom Murphy, assistant professor of sheep production in the Department of Animal and Range Sciences, said that the partnership and future efforts to incorporate university-grown and finished lamb onto dining hall menus is a "great opportunity to introduce students and the MSU community to American lamb while stressing the importance of a well-balanced meal."

Providing food for MSU students to consume is satisfying for the students and researchers who raise the animals, as well, added **Patrick Hatfield**, head of the Department of Animal and Range Sciences.

Rich Huffman, director of MSU Culinary Services, said that Culinary Services is pleased to support MSU's land-grant mission of "focusing on the teaching of practical agriculture. "We do this by collaborating with local producers, ranchers and farmers, and by supporting students and future producers from our College of Agriculture," he said.

Huffman said that while the MSU Farm to Campus program is working internally to source the most local meat possible, the program couldn't do it without the assistance of Montana's local meat processors.

"Most rewarding is developing relationships with our local partners, and really understanding and sincerely appreciating what it takes to bring our food from farm to campus," Huffman said.

Dr. Clayton Marlow, Professor in the Department of Animal & Range Sciences, was elected as the 2nd Vice-President for the Society of Range Management.

The Society for Range Management is the professional scientific society and conservation organization whose members are concerned with studying, conserving, managing and sustaining the varied resources of the rangelands which comprise nearly half the land in the world. Established in 1948, SRM has over 4,000 members in 48 countries, including many developing nations.

SRM's members are land managers, scientists, educators, students, producers and conservationists–a diverse membership guided by a professional code of ethics and unified by a strong land ethic. The mission of SRM is providing leadership for the Stewardship of Rangelands based on sound ecological principles.

Jayce Fulbright, a graduate of the MSU Farrier School, was recognized as one of the "Rising Shoeing Stars" at the 2017 International Hoof-Care Summit in Cincinnati, Ohio. The award recognizes farriers who have made incredible professional progress within three years of graduation from farrier school. **Bryce Kawasaki**, MSU Farrier School Instructor, also received a plaque for his teaching and training. Jayce was a graduate of the Fall 2013 class of farriers. The school is a 16 week program held twice a year. For more information, visit the website at http://animalrange.montana.edu/horseshoe.html.

In the News

A new, one-of-a-kind machine designed by MSU's Montana Manufacturing Extension Center was put through its paces when 200 sheep at Red Bluff were sheared.

Wool Lab Manager Andy Williams tests wool fleece from Targhee-Rambouillet cross-breed sheep with a wool coring machine.

Unlike other, older machines used to assess the quality of wool, the one designed by MMEC is faster and portable, said **Whit Stewart**, MSU sheep extension assistant professor of sheep and wool production in the Department of Animal and Range Sciences.

By allowing his team to quickly and efficiently take wool samples on-site, the machine is increasing the team's capacity for identifying sheep that yield quality wool, which could help Montana sheep producers breed for higher profits, Stewart said.

MSU Wool Lab manager **Andrew Williams** placed the sheared fleeces into the machine's filing drawer-sized box made of heavy-gauge metal. At the press of a lever, powerful hydraulics rammed a grid of 16 hollow spikes into the box, sending "core" samples of wool onto a tray below.

Taking multiple cores from each fleece ensures accurate sampling, said **Weston Helle**, a sophomore majoring in range science and a research assistant with MSU Extension's sheep program.

Back at the Wool Lab, the samples will be weighed, washed of their lanolin, then re-weighed to determine the wool's "clean weight." The greater the clean weight, the greater a sheep's "yield." The size and shape of the wool fibers would also be measured. "You want to have high-yielding, uniform fleece to get the best profit from your wool crop," Williams said.

MMEC director Paddy Fleming said he and his colleagues enjoyed the engineering challenge of designing the machine. Former MMEC engineer Rob Cook, who graduated from MSU's College of Engineering in 1988, was the primary designer. MMEC selected Gerbers of Montana, Inc., an agricultural service provider and manufacturer in Great Falls, to fabricate the machine.

Weston Helle shares insight on using a wool coring machine before testing wool fleece from Targhee-Rambouillet cross-breed sheep.

The MSU Wool Lab is one of only two wool research facilities at land-grant universities in the U.S. According to Stewart, MSU Extension hopes to leverage the wool-testing machine's capacity into providing increased assistance to Montana wool growers.

"We took our knowledge of animal husbandry and wool, and combined it with MMEC's engineering expertise, to make a unit that allows us to do research that needs to be done," he said.

See the full story at http://www.montana.edu/news/16903/msu-partnership-makes-quick-work-of-wool-testing

Photos by Adrian Sanchez-Gonzalez
Adapted story by Marshall Swearingen

In the News

Two MSU Range Management Club teams – the Undergraduate Range Management Exam team and the plant identification team -- competed at the International Society for Range Management meeting in St. George, Utah, earlier this year.

Craig Carr, assistant professor of rangeland ecology in the Department of Animal and Range Sciences in the College of Agriculture and team adviser, said the students who make up the teams ranked – and competed -- among the best in the country and beyond. This year, 24 schools competed at the annual event.

Team members who competed in the plant identification contest : Noah Davis, Michael Hamel and Kegen Benson, Tori Chulyak, Loni Blackman and Jessica Hickel

MSU's URME team won fifth place in the exam competition, which required competitors to take a comprehensive two-hour exam that covers range ecology, grazing management, range improvement, range regions, inventory and analysis, and multiple-use land. MSU adjunct professor **Merrita Fraker-Marble** coaches the team.

Senior **Noah Davis** earned the second highest score on the URME, which he called "tough." He said, "Being an undergraduate, you don't know all of the things they are asking, so you end up pulling knowledge from other areas in an attempt to piece together what answer is most reasonable."

The MSU Plant Identification team took eighth place in the SRM Range Plant Identification Test, which challenges students to identify up to 100 plant specimens in as many minutes, said Carr, who has coached the team for four years.

Team members who competed in the URME: Connor Hodgskiss, Loni Blackman, Brandon Gould, Weston Helle, John Walker and Noah Davis.

"Students study a master list of 200 different plants that are reasonably common on western rangelands from Mexico to southern Canada," he said. "Then, they must determine whether the plant is perennial or annual; if it was introduced or native; and they need to know -- and correctly spell -- the plant's family name, genus name and species name."

Davis placed 13th overall in the plant identification test. "You have 60 seconds to look at a bare twig or blade of grass that looks like a semi-truck ran over it three times, decide between 200 plants which one you think it is – sometimes based on highly obscure and subjective features -- then write down its scientific name and classification," he said.

Based on his scores in both competitions, Davis earned second place in the Individual High Combined Awards, meaning he had the second highest combined scores of all students who competed in both the URME and plant identification contests."MSU's teams competed with students from universities across the U.S., Mexico and Canada, and they're doing some good stuff," Carr said. "Our students are in the top echelon of range science people."

Club members who are on one or more of the teams practice weekly with their coaches. Carr said that performing well in the competition can provide students with the exposure and professional contacts that may help them in their future careers.

Photos by Craig Carr
Adapted story by Erin Strickland

Publications and Presentations

Publications:

Thompson, S.J., C.M. Handel, R. Richardson, and **L.B. McNew**. 2016. When winners become losers: Arctic birds demonstrate non-linear responses to gradients of woody vegetation. PLoS ONE 11(11): e0164755. doi:10.1371/journal.

Ganser, C., A.J. Gregory, **L.B. McNew**, L.M. Hunt, B.K. Sandercock, and S.M. Wisely. 2016. Fine-scale distribution modeling of avian malaria vectors in north-central Kansas. Journal of Vector Ecology 31:114-122.

Winder, V.L., M.R. Herse, L.M. Hunt, A.J. Gregory, **L.B. McNew**, and B.K. Sandercock. 2016. Patterns of nest attendance by female greater prairie-chickens in northcentral Kansas. Journal of Ornithology 157: 733-745.

Lance McNew was one of 15 co-authors receiving the Wildlife Society's Wildlife Publication Award for Best Article in 2016 for their paper titled, "Factors affecting female space use in ten populations of prairie chickens" published in the journal Ecosphere. For more than 75 years, The Wildlife Society has made annual awards for excellence in four publication categories, including Article, Monograph, Edited Book, and Book. One publication is recognized in each category and is selected from work published in the last two years. Dr. McNew has won the award twice in the last three years.

New grant: **Lance McNew** was awarded a 3-year award totaling $289,872 from the U.S. Fish and Wildlife Service for a study titled, "Defining habitat quality for northern grassland birds in Montana"

Lance McNew's Rangeland Wildlife Ecology class was commissioned by Montana Department of Fish, Wildlife, and Parks to evaluate the potential for reintroduction of sharp-tailed grouse into western Montana, and develop Montana's Sharp-tailed Grouse Restoration Plan. The Plan will be used to guide the restoration of sharp-tailed grouse into previously occupied habitats west of the Continental Divide. A&RS graduate students co-authoring the plan were: **Megan Milligan, Smith Wells, Skyler Vold, Jarrett Payne, Sam Wyffels, Alicia Netter, and Alyson Hicks-Lynch**.

Torrey Ritter, graduate student in the Wildlife Habitat Ecology Lab, was selected at the 2016 winner of the Don C. Quimby Graduate Wildlife Research Scholarship. This scholarship was established to honor Dr. Don C. Quimby, a biology teacher, student advisor and founder of the Wildlife Program with Montana State University's Biology Department in 1948. Eligibility criteria include: 1) enrolled in MSU's graduate school, seeking either a M.S. or Ph.D. in the Ecology Department, or a M.S. or Ph.D. with a Wildlife-Range Management project in the Animal and Range Sciences Department, 2) field research project focused on a free-ranging wildlife species within the state of Montana, 3) an ability to conduct independent research, 4) scholastic seriousness and intellectual honesty, 5) enthusiasm and willingness to work with fellow professionals and the public, 6) commitment to a career in wildlife management.

Perea K, Perz K, Olivo SK, Williams A, Lachman M, Ishaq SL, Thomson J, Yeoman CJ. 2017. Feed efficiency phenotypes in lambs involve changes in ruminal, colonic, and small intestine-located microbiota. Journal of Animal Sciences. In press

Ishaq SL, Johnson SP, Miller ZJ, Lehnhoff EA, **Olivo S, Yeoman CJ**, Menalled FD. 2016. Impact of cropping systems, soil inoculum, and plant species identity on soil bacterial community structure. Microbial Ecology 73(2): 417-434. doi:10.1007/s00248-016-0861-2

Feng W, Minor D, Liu M, Li J, Ishaq SL, **Yeoman CJ**, Lei B. 2016. Null mutations of group A Streptococcus orphan kinase RocA: Selection in mouse infection and comparison with CovS mutations in alteration of in vitro and in vivo protease SpeB expression and virulence. Infection and Immunity 85: e00790. Doi: 10.1128/IAI.00790-16

Vlčkováa K, Gomez A, Petrželkovád KJ, Whittierg CA, Toddi AF, **Yeoman CJ,** Nelson KE, Wilson BA, Stumpf RM, Modrýa D, White BA, Leigh SR. 2016. Effect of antibiotic treatment on the gastrointestinal microbiome of free-ranging western lowland gorillas (Gorilla g. gorilla). Microbial Ecology. 72(4):943-954. doi:10.1007/s00248-016-0745-5

Publications and Presentations

Publications:

Stumpf RM, Gomez A, Amato KR, **Yeoman CJ**, Polk JD, Wilson BA, Nelson KE, White BA, Leigh SR. 2016. Microbiomes, metagenomics, and primate conservation: New strategies, tools, and applications. Biological Conservation 199: 56 – 66. http://dx.doi.org/10.1016/j.biocon.2016.03.035.

Presentations:

Regan, B.S.*, F.T. van Manen, **L.B. McNew**, D. Tyers, K. Gunther, B. Sowell, and D.W. Smith. 2016. Grizzly bear scavenging of spring carrion across two management jurisdictions of the northern Yellowstone winter range (1997¬–2012). Biennial Greater Yellowstone Ecosystem Conference, Jackson, Wyoming.

Wells, S.L.*, L.B. McNew, and D.B. Tyers. 2016. Grizzly bear use of forest service grazing allotments in the Greater Yellowstone Ecosystem. 54th Annual Conference of the Montana Chapter of The Wildlife Society, Missoula, Montana (poster).

Dr. Carl Yeoman was an invited speaker for the Institute for Genomic Biology Seminar series at the University of Maryland School of Medicine in Baltimore, MD in September and presented a talk entitled “Biogenic amines: Biomarkers of bacterial vaginosis or precursors to vaginal dysbiosis”.

Jennifer Thomson published her first single author publication entitled, “Impacts of environment on gene expression and epigenetic modification on grazing animals”. Understanding how physiology is altered by the animal’s environment including its epigenetic, nutritional and management exposure is a major challenge in optimizing livestock breeding and production. Considerable efforts have been expended in developing techniques for examining gene expression and its regulatory mechanisms such as epigenetic modifications, genetic determinants, nutritional factors and animal production systems. In this review, the technological advances in gene expression and epigenomics in livestock are discussed. Some examples of how these techniqueshave been used to improve our understanding of the nutritional and management regulation of gene expression, impacts of gene expression on animal performance, and impacts of epigenetics on the response of grazing livestock to changing nutritional and management environments are examined. J. Anim. Sci. 2016.94(S6):63-73.

Check out this YouTube video that shows field testing of a new electric fence design to keep grizzly bears away from agricultural food sources. The video features Lance McNew’s MS graduate student **Brittani Johnson**.

https://www.youtube.com/watch?v=0nMgjWi5hd4

YouTube

Publications and Presentations

Mike Frisina attended a conference in Tajikistan in November. The president of Tajikistan requested a round table discussion to develop conservation regulations and laws for his country. Mike was fortunate to be one of eight foreign experts to attend. He was asked to give two presentations; one was a description of USFWS, ESA and US CITES regulations as they pertain to importation of hunted trophies into the USA, the other described the essential components to establishing a credible community-based, sustainable use conservation project. They also spent time working with Tajik citizens and government officials to develop a detailed resolution setting the future direction of conservation by agencies in Tajikistan. Following the convention, the President adopted the resolution. The foreign experts also inspected a community based conservation project for Bukharan markhor (a rare species of wild goat).

The markhor habitat in Tajikisatn. Left side of the river is Tajikistan, right side of the river is Afghanistan.

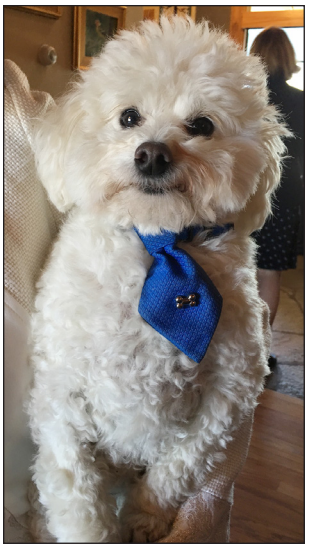
Example of Markhor taken on the community based area.

President's round table in session.

Awards, Honors, and Grants

The Animal and Range Sciences Administrative Team was awarded Pure Gold! "The energy and commitment the team brings to the department is amazing," said Department Head Dr. Patrick Hatfield. "They are all outstanding professionals who go above and beyond their job descriptions to make tremendous contributions to the research, teaching, and service missions of Montana State University. Their efforts make our department a better place to work and study for students and faculty." Whether working as a team or independently in their respective roles, the administrative team provides steadfast support to its faculty, staff and students. The ANRS Administrative Team was honored at a ceremony on May 4, 2017 at the residence of MSU President Waded Cruzado.

Front: **Sharon Henderson, Julie Hager**
Back: **Denise Thompson, Lisa White, Susan Cooper**



One of the gracious hosts for the Pure Gold reception! Blanco is one of Dr. Waded Cruzado's loyal companions and greeted everyone at the door.

At the annual meeting of the Montana Wildlife Society last month, two of **Dr. Lance McNew**'s grad students were honored. **Skyler Vold** won Best Poster Presentation for his presentation, "Effect of grazing system on the abundance and diversity of grassland birds in northern mixed-grass prairie habitats". **Torrey Ritter** was awarded a Small Research Grant for his proposal "Estimating the age of live-captured beavers". They are pictured receiving their awards from the Montana State Chapter President, Mark Ruby.

Awards, Honors, and Grants

Congratulations to the students who participated in the Montana Nutrition Conference and Livestock Forum poster competition. We had 11 posters this year. Kim Hager, CHS Nutrition and longtime judge for the competition said it was the best set of posters and presentations he has see at the conference.

Undergraduate:
Amanda Williams et al.
"Seeding date impact on production of three cool-season forage species"

Graduate:
First: **Skyler Vold** et al.
"Effect of grazing system on the abundance and diversity of grassland birds in northern mixed-grass prairie habitats"

Second: **Chad Page** et al.
"Effects of zinc source and dietary concentration on zinc status, growth performance, and wool characteristics in developing rams"

Third: **Ashton Hubbard** et al.
"Does calcium propionate elicit similar growth and reproductive responses as Monesin in developing heifers"

Eight Montana State University seniors won the 2017 Torleif Aasheim Community Involvement Award. The university's top award for student service recognizes senior students who, in addition to excelling academically, volunteer on campus and in the community. The award is named for late MSU alumnus Torleif "Torley" Aasheim, former director of the Montana State Cooperative Extension Service and a member of the class of 1937.

Isaac Stafstrom, from the College of Agriculture, is pursuing an honors degree in animal science livestock management and industry. While at MSU, he has participated in the Bozeman Symphony Choir and has served on the Board of Directors for Big Sky Youth Empowerment. Additionally, he has been inducted into the Alpha Zeta and Phi Kappa Phi honor societies. He is also an undergraduate researcher who works with Professor Tony Hartshorn.

The AGSC 342 Scholarship is an annual forage scholarship that **Dr. Emily Glunk** awards each year to deserving students based on course performance, class participation, and their leadership skills as evidenced through the group project. AGSC 342 teaches the principles of applied forage crop management including establishment, irrigation, fertilization, pests, harvesting, and forage integration of many legume and grass species.

Grand Prize:
Caroline Wild and **Amanda Williams**

Runners Up:
Kendall Franks, Isaac Stafstrom and **Samantha Severyn**

Awards, Honors, and Grants

Wool Research and Education: U.S. Wool Quality Audit, State of the Industry. The **Montana Wool Lab** is working with Texas A&M AgriLife Research on conducting a needs assessment of future wool research and education needs across the industry, current U.S. wool quality characteristics by region etc. Findings will help guide coordinated research efforts between the only two university wool labs remaining in the country. $40,000.

American Sheep Industry Association: Montana's Next Generation Wool Grower Program. This is a joint effort between the Montana Wool Growers and **MSU Sheep Extension Program**. This grant will help the development of young producer groups to facilitate enduring networking and information exchange that translates into best management practices and leadership in the sheep industry. They have, to date, completed two successful young producer specific programs through the support of this grant and are looking forward to a MSU sheep short course and Canadian sheep industry exchange the fall of 2017. $10,000.

Montana Department of Agriculture: Growth Through Agriculture. "Wool Pool Software Development". This grant is allowing the **MSU Sheep Extension Program** to revamp existing software used in wool pool delivery throughout wool pools in Montana. They are working with MSU College of Agriculture software engineer John Sully to have a version ready for wool pool shipping this spring. $4500. The Growth Through Agriculture (GTA) program is a grant and loan program established by the Montana Legislature to strengthen and diversify Montana's agricultural industry through development of new agricultural products and processes. The GTA program is administered by the Montana Department of Agriculture with counsel from the Agriculture Development Council.

Carl J. Yeoman was part of a Grant led by Mary Miles (Health & Human Development) awarded $150,000 by the US Dept. of Agriculture to Determine the Gut Microbiota-dependent Impacts of Anthocyanin-rich Aronia Berries on Obese Individuals of Distinct Inflammatory Phenotypes.

Carl J. Yeoman and Elizabeth Rink (HHD) were awarded $135,288 by NIH-NIGMS AIAN-CTR to continue work with the Ft. Peck Reservation to understand the influences of stress and behavior on biogenic amines and microbes in the context of reproductive health.

Devon Ragen received $249,502 from the Western SARE program for the project, "The Impacts of Integrating Livestock into Cropping Systems on Soil Health and Crop Production". Co-PIs are Dr. Perry Miller, **Dr. Patrick Hatfield**, **Dr. Emily Glunk**, and **Dr. Carl Yeoman**. With this grant money, Devon and her team will investigate the effects of integrated plant-livestock production by determining impacts on the microbial diversity, biochemistry, and compaction of soil, and assess the resulting impacts on soil and plant tissue nutrients, and root biomass of cover crops as well as subsequent impacts on crop yields and livestock performance in both production farms and a field research environment. These biological, agronomic, and livestock responses will be the basis for future enterprise-level economic assessment of these diverse systems. They will conduct a broad-based series of independent studies to compare soil health and subsequent crop production in five diverse agricultural systems that include organic livestock, vegetable, and cash crop farms, and a university research farm (Fort Ellis).

Research Highlights

Dr. Tom Murphy, Assistant Professor of Sheep Production and **Dr. Whit Stewart**, Assistant Professor and Sheep Extension Specialist, have been very active this past year with the sheep research program.

One project recently finished used old crop (~18 months of age) wethers to determine if meat flavor profiles could be influenced by finishing diet and, ultimately, increase consumer acceptance of meat cuts from these older animals. There is evidence that plant secondary compounds can positively influence lamb flavor by reducing the concentration of off-flavor compounds present in sheep meat. Therefore, Whit, Tom, and **Dr. Jane Ann Boles** (in collaboration with Texas A&M University) fed these wethers two finishing diets: 1.) a diet with 20% chopped oat hay and low plant secondary compound concentration and 2.) a diet with 20% ground Juniper and high plant secondary compound concentration. They are waiting to conduct a consumer taste panel, but preliminary results reveal no differences in wether growth or carcass characteristics among treatments, which assures that Juniper can be incorporated into sheep finishing diets without detriments to animal health and performance.

A current project at Fort Ellis is comparing feed efficiency, growth, and carcass characteristics among purebred and crossbred wether lambs. The lambs represent 3 breed backgrounds: 1.) purebred Rambouillet; 2.) Suffolk-Rambouillet cross; and 3.) South African Meat Merino-Rambouillet cross. Very little research on the incorporation of SAMM genetics into U.S. sheep flocks has been done and Whit and Tom look forward to evaluating their potential as a terminal and maternal sire.

Future research this Spring will evaluate how different shearing treatments (6 and 3 weeks prior to lambing) affect ewe body temperature regulation and feed intake as well as subsequent lamb performance. Following lambing this Spring, Whit, Tom, and **Dr. Carl Yeoman** will collaborate with the U.S. Sheep Experiment Station to determine the major contributors of clinical and sub-clinical mastitis in ewes and identify causative pathogens in range operations.

As always, this research would not be possible without the help from our dedicated graduate and undergraduate students: **Chad Page, Weston Helle, Ben Roeder, Casey Smith,** and **Sarah Spear.**

Devon Ragen (Research Associate) and **Molly Butler** (PhD graduate student) worked on multiple research projects at the Fort Ellis Research Station during the summer and fall of 2013-2015. A summary of these projects is as follows:

<u>Cover Crops and Lamb Finishing</u>

Little information is available on the integration of lamb finishing systems with the termination of a cover crop. The synergistic impacts of using sheep to terminate cover crops in organic and no-till farming systems, as a method of finishing lambs and a partial solution to the seasonal availability of quality lamb, is an area which needs further research. Using lambs to terminate a cover crop may prove to be beneficial to both the crop and animal producer by reducing termination costs while allowing lambs to gain weight on an inexpensive, high-quality feed source.

During the summer months at Fort Ellis, wethers were finished in confinement pens with GrowSafe feeders or on cover crop grazing plots (Austrian Winter Pea or Yellow Sweetclover). Preliminary results from this research have shown that lambs fed a pelleted diet in confinement had higher ADG than lambs grazing cover crops. However, terminating a cover crop with lambs has the potential to reduce herbicide use and costs associated with tillage operations for producers.

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Research Highlights

"Feedlot on Fields"

Previous research has only focused on grazed or harvested forage as the diet for finishing livestock. Providing feed to livestock on cropland is an unconventional way to finish livestock while adding manure to the soil. For producers interested in retaining and finishing lambs themselves, feeding out lambs on fields, without the risk of a high-grain diet, may be a progressive opportunity. The objectives of this 2 year study were to compare the effects of finishing diet and location on the performance, carcass characteristics, and parasite loads of weaned, crossbred lambs. In the fall, Devon and Molly finished lambs with an alfalfa- or barley-based diet on wheat stubble fields or in confinement pens with GrowSafe feeders.

Results from this research showed that lambs finished on fields had higher ADG and ending body weight than lambs finished in confinement. Carcasses from lambs that consumed the alfalfa-based diet were less tender than carcasses from lambs that consumed the barley-based diet but there was no difference in quality grade. Cost of gain was highest for lambs consuming the alfalfa-based diet (because they consumed more feed); however, these lambs applied approximately 60% more manure to each wheat stubble field than the lambs consuming the barley-based diet. In the second year of the study, lambs consuming the alfalfa-based diet had higher Nematodirus spp. (round worms) eggs per gram.

Salt Intake

Previous research has reported high variation in intake of self-fed protein and/or energy supplements by livestock, however little is known about variation in consumption of salt. Sheep that are salt deprived will consume less feed and water. However, the overconsumption of salt by sheep can have detrimental effects including reduced feed intake and a decline in bodyweight. Our project investigated the impact of form of salt (block or loose), location of feeding (confinement or field), and type of feed (alfalfa- or barley-based) on salt intake in weaned lambs.

Our results indicate that sheep housed in pens consumed more salt than sheep fed on wheat stubble fields. Sheep fed loose salt consumed more salt than sheep offered block salt and the type of diet (alfalfa- vs. barley-based) did not impact salt consumption. The results of this study may aid feed companies in formulating salt, mineral, and feed rations that help meet sheep nutritional requirements.

Soil

Although our preliminary results indicate a broader diversity of microbes in integrated rather than specialized systems, on a national scale, little has been reported on soil microbial populations in diverse farming systems and no work has investigated the impact of targeted grazing and feeding to finish livestock on fallow fields in farming systems. Coupled with the impact of soil microbial communities on soil health, is the effect of sheep and cattle on soil compaction.

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Research Highlights

The objective of this work is to compare selected chemical, physical and microbiological attributes under an integrated crop-livestock system, a tilled organic system, and a conventional no-till system. The main focus of this study is to document and disseminate the impacts of incorporating sheep into organic systems on soil health as indicated by soil microbial population function and diversity, soil compaction, and soil nutrient profiles, as well as subsequent crop yields.

Data collection is still in progress for this study but preliminary results indicate that there is no difference in soil compaction or bulk density amongst the three treatments (grazed organic, tilled organic, and conventional). Furthermore, an analysis of the soil from these plots revealed increased nitrogen (kg/ha) in the grazed organic plots.

Master's student **Ashton Hubbard** from Red Bluff, CA is conducting a two-year heifer development study investigating how different feed additives my influence heifer reproductive performance. Replace heifer development is a critical process for ranchers who raise their own replacements and those who develop heifers for purchase by others. Heifer development focuses on factors that enhance physiological events responsible for promoting puberty. One of the factors influencing the age at which heifers begin regular estrous cycles is weight.

Feeding ionophores, such as Rumensin, to developing heifers improves feed efficiency and decreases age at puberty. It is believe that this is accomplished by increasing the propionate: acetate ration in the rumen. However, another area of research is focusing on calcium propionate. It was found that young postpartum range cows fed protein supplements containing calcium propionate altered nutrient partitioning away from milk production and toward body weight gain, resulting in shorter days to first estrus.

Ashton's study will evaluate the responses of heifers fed pellets containing no feed additive, Rumensin or calcium propionate. This could potentially give producers another tool to use that could be especially beneficial to a range development setting.

Year one of the study was conducted at the Bair Ranch in Martinsdale, MT, in the spring of 2016. The second year of the study is currently underway at the BART Farm in Bozeman utilizing 60 heifers in the dry lot pens.

Ashton and **Dr. Rachel Endecott**, Extension Beef Cattle Specialist and Associate Professor, would like to acknowledge and thank the Bair Ranch Foundation for their support of this research.

Graduation 2017

The Department of Animal & Range Sciences held a graduation ceremony for the students in the Animal Biosciences Building, Friday, May 5, 2017. Listed are the prospective* graduates for Spring 2017 and Summer 2017.

Spring Graduate Degree Graduates

Eric Elkins — MS
Rashelle Herrygers — MS

Summer Graduate Degree Graduate

Omolola Betiku — PhD

Spring Bachelor of Science Animal Science Graduates

Jordan Adams
Robert "Gus" Anderson
Jessica Brown
Annalyssa Campbell
Shaniya Carey
Katie Combs
Dusti East
Melissa Evanson
Olivia Fernandez
Diana Florian-Ospina
Simon Gratch
Jamie Haigh
Shannon Harris
Melissa Hilgendorf
Madison Hoffman
Morgan Lovejoy
Frank Marcy
Madison McCann
Thomas Morton
Heather Olson
Alyssa Riley
Carine Riley
Emily Shaffer
Gwynn Simeniuk
Katie Sprague
Isaac Stafstrom
Ramie Steer
John Stewart
Cole Taber
Sarah Thompson
Erika Tinetti
Matthew Vandeberg
Conner Van Dyken
Brianna Vlach
Hope Webster
Courtney Williams
Nora Wittmayer
Emily Wright
Mariah Young

Spring Bachelor of Science Natural Resources & Rangeland Ecology Graduates

Bridget Baker
Loni Blackman
Dawn Blevins
Elena Burlet
Joseph Capella
Nate Haygood
Tyrel Hess
Jessica Hickel
Mariah Hicks
Katrina Johns
Miles Mankins
Hayden Nelson
Jessica Rackley
Matthew Ryan
Derek Schleicher
Danielle Walker

Summer Bachelor of Science Animal Science Graduates

Joseph Evans
Katelyn Harris
Madison Hoffman
John Holst
Layton Hrubes

Summer Bachelor of Science Natural Resources & Rangeland Ecology Graduates

Connor Doyle

** graduation requirements not finalized at newsletter deadline*

Graduation 2017

Friends and family gather to watch graduates of the Animal & Range Sciences department.

Dr. Charles Boyer, Dean of the College of Agriculture, addresses the graduates.

Mariah Young accepts her award from Dr. Patrick Hatfield 2016-2017 Outstanding Graduating Senior in Animal and Range Sciences.

Isaac Stafstrom accepts his award from Dr. Patrick Hatfield as 2016-2017 Outstanding Graduating Senior in Animal and Range Sciences.

Omolola Betiku, PhD candidate, accepts her vest from Dr. Patrick Hatfield.

Range and Natural Resources graduates and their professors.

Graduation 2017

Photos by Phil Merta. See more at https://www.facebook.com/MSU.Animal.Range.Sciences/.

MSU Colt Starting Class

The MSU Colt Starting Class raised over $155,550 at the 11th annual Top of the West Horse Sale and Ranch Competition April 7-8 at Copper Spring Ranch near Bozeman. The funds benefited the Equine Booster of MSU for the Equine Science Program. The high selling colt, FQHR Last River (aka “Grace”), sold for $15,500. Grace was started by Shantal Smith (pictured at the left with Grace). Reata Brannaman and Isaac Johnson provided instruction for the class during the two semester course, which included 33 horses. The class wishes to thank all the donors and buyers that continues to make this program successful. You can follow the adventures of the Colt Starting Class on their Facebook page, “MSU Colt Starting Class”.

Giving Young Horses and Horsemen a “Good Start”

MSU Farrier School

photos by Doc Cravens

The Spring 2017 MSU Farrier School (March 6 – June 23, 2017) is designed specifically for those who wish to pursue careers as farriers. This professional course provides students with the opportunity to obtain a solid background in the field of farrier science through the application of sound principles in a practical hands-on setting. Students have the opportunity to obtain the knowledge and develop the skills necessary to establish their own practice, qualify for licensing at major race tracks, and prepare for the American Farrier Association Certification exam. The Fall session is July 31 – November 17, 2017.

MSU Sheep Shearing School

Another successful shearing event at the MSU Red Bluff Research Ranch. The Sheep Shearing School was held March 17-18, 2017. Seven intermediate-level shearing students participated in an intense two-day program that allowed them to hone their shearing skills on more than 550 ewes at the facility. They also learned about wool production and proper tool care. The school was led by Mike Schuldt, Brent Roeder, Ryan Keyes and Whit Stewart. While the instructors were on-hand to offer guidance and assistance, students helped each other as well. Those participating were: Isaac Stafstrom, James Kramer, Shannon Kahler, Ben Roeder, Johnny Harbor, Weston Helle and Forrest McEwen. Andy Williams and Sarah Spear helped collect the wool for testing. It was a fun and productive clinic that bodes well for the future of sheep shearing in Montana.

MSU is the new owner of 51 head of cattle, which the university bought from MSU alumni Bob and Rita Dige of Double Tree Red Angus out of Sand Coulee. The herd includes 32 cows, 9 bred heifers and 10 replacement heifers. It is the first red Angus purebred cattle herd the university has ever owned.

Photos by Adrian Sanchez-Gonzalez.
Adapted story By Jenny Lavey

In October, MSU purchased the herd from the Diges for market value, in part by using sales income from the university's existing black Angus herd. The red Angus herd is now living at the Bozeman Agricultural Teaching and Research Farm, which the Department of Animal and Range Sciences in the College of Agriculture manages.

MSU Extension Beef Cattle Specialist **Dr. Rachel Endecott** and MSU Assistant Professor of Genetics **Dr. Jennifer Thomson** said the herd will have a major and lasting impact on Montana's cattle industry, student instruction and university livestock research.

That might be because of the meticulous and detailed genetic recordkeeping related to the herd; the Diges gave MSU a record book that includes breeding stock specifics and notes down to the individual cow, Endecott said.

"The level of recordkeeping is remarkable, even for a registered herd," Endecott said. The recordkeeping was so detailed, Endecott added, that the Diges even catalogued the feeding and behavioral tendencies of some individual cows.

Thomson, who studies the physiology and biology of economically important traits in livestock breeding and genetics, said the Diges' recordkeeping will allow MSU to build on the herd's genetic evaluation and improve predictions of cattle genetic merit that are applicable to the beef industry.

"Our goal as researchers is to identify regions of the genome that harbor genes and variants related to specific traits that are economically relevant to the industry like growth, weaning weight, milk production and reproduction," she said. "Ultimately, we want to understand and explain all of the genetic variation in a trait so that we can accurately predict performance and tell producers how to utilize genomic tools to meet their goals."

Well-known for their highly desirable traits such as mothering ability, carcass qualities and heat tolerance, red Angus are also known for their unique docility and progeny value, Thomson said.
Endecott said that although many Montana ranchers raise black Angus cattle, the applied research that will come from the red Angus herd has major economic impact for all Montana livestock producers. And, in an effort to investigate inherited bovine traits, she said some of the red Angus cattle will be bred with the university's existing black Angus cattle.

"As a university, we're well-positioned to take some risks associated with breeding for traits that producers may not be willing to risk," she said. "With an entire purebred red Angus herd, we can investigate seedstock at a university that has the facilities, people and equipment to deliver research that all Montana ranchers can use."

See story at http://www.montana.edu/news/16678/msu-purchases-red-angus-cattle-herd-first-in-university-s-history.

Kami Kilwine, rangeland management specialist for the USDA Natural Resources Conservation Service in Miles City, was recognized by NRCS as the Early Career Rangeland/Pastureland Conservationist for 2016 during the NRCS Family Meeting held at the Society for Range Management 70th Annual Meeting in St. George, Utah, in early February.

The purpose of the award is to recognize NRCS employees who have exemplified outstanding service to NRCS and their customers through implementation of sound technology transfer on rangeland and pastureland resources. This award is presented as an encouragement for outstanding performance by men and women entering the grazing lands profession. One award is given annually. Award winners have less than 10 years of Federal service and demonstrate extraordinary potential and promise as a future leader for rangeland or pastureland conservation issues.

Kami graduated Montana State University in December 2009 with a BS in Natural Resources & Rangeland Ecology with the Wildlife Habitat Ecology & Management option.

Courtesy of NRCS Montana

Dr. Jeff Mosley, Rangeland Extension Specialist, has been elected to the College of Agriculture Promotion and Tenure Committee for a term of three years.

The College P&T Committee is charged with reviewing all submitted materials, providing any required materials, conducting a fair, objective, independent, and substantive review of the candidate's dossier based on department, college, and University criteria and standards and make recommendations regarding retention, tenure or promotion.

The history of the Animal and Range Sciences Department at Montana State University actually began before the start of the Agricultural College of the State of Montana in 1893. As Montana was settled, many farming and ranching practices which worked in the east were quickly found to be ineffective in the unique environmental conditions of the Rocky Mountain west and the Great Plains. The need for research and knowledge regarding livestock production in Montana was essential to provide food for the increasing population.

Take a look at this amazing timeline compiled by **Dr. James E. Knight**, Professor Emeritus at http://animalrange.montana.edu/ANRS_History.html. The History of the Animal and Range Sciences Department is dynamic and we hope to continually add to the content. We invite former students and faculty or friends of the department to send us any memories, tributes, photos or other information that we might add. Please send these to Dr. Knight at jknight@montana.edu. Be sure to include the years you were at MSU and your major.

In March 2017 Elizabeth Flesch participated in an international Programming for Evolutionary Biology course at the University of Leipzig in Germany. This three week course served to both support her dissertation research regarding bighorn sheep genomics and enhance her professional development. Elizabeth is a Ph.D. candidate in the interdepartmental Ecology and Environmental Sciences program and is co-advised by **Dr. Jennifer Thomson** in the Animal and Range Sciences Department and Dr. Robert Garrott in the Ecology Department. Her dissertation research involves quantifying genomic attributes of bighorn sheep populations with a range of different herd histories in Montana and Wyoming, to learn how genomic information can assist bighorn sheep management decisions.

During the course, Elizabeth developed computational programming skills for genomic and evolutionary research that will empower her to advance understanding regarding bighorn sheep genomics in Montana and Wyoming. Specifically, she learned how to compose code in multiple different programming languages, utilize open source genomic software, and automate data processing. In addition, she benefited from course modules particularly relevant to her research efforts, including population genomics and visualization of scientific data. Throughout the course, Elizabeth interacted and collaborated with other Ph.D. students, postdoctoral researchers, and faculty who conduct diverse research regarding plant, fungi, and wildlife genomics all over the world, including Germany, France, Switzerland, England, the Netherlands, Spain, Portugal, Italy, Turkey, Columbia, and Mexico.

The course not only benefited Elizabeth's analysis of bighorn sheep genomics, but also served to inform her efforts to plan future research. In general, Elizabeth benefited from networking and discussing potential analysis options with course instructors and other participants. She is also interested in exploring the use of next generation sequencing, and the course modules regarding this topic will be helpful for consideration of these research options. In addition, her dissertation research will include a comparison of ancient and modern bighorn sheep genomics, and course modules with an evolutionary perspective will assist with this effort. Elizabeth looks forward to applying her new practical skills gained through this opportunity to benefit wildlife research and management in Montana. Elizabeth's participation in the workshop was supported by the National Science Foundation Graduate Research Fellowship, Montana Fish, Wildlife, and Parks, the Ecology Department, and the Animal and Range Sciences Department.

Food safety is an important part of the meat industry. Every inspected plant, and now most retail establishments, must have someone trained in the food safety procedures called HACCP or Hazard Analysis Critical Control Points. This science based food safety system was originally developed for NASA and space flight. Every year the Montana HACCP training group, consisting of MSU faculty, Department of Livestock inspection staff, Department of Health, and MSU Extension, conduct a 2-½ day training that includes information about microbiology and satisfies the requirements for federal inspection for training in HACCP.

On May 16-18, 2017, 16 participants from meat plants, inspection and food processing facilities were introduced to HACCP. During the training, participants develop a HACCP plan after visiting a production facility. This year's training team included **Dr. Jane Ann Boles**, Animal & Range Sciences faculty member, Mike Finnegan and Dave Sylvester from the Department of Livestock; Christine Cox from the Department of Health, and Lynn Paul from MSU Extension.

Students who take **Dr. Jane Ann Boles** Meat Processing class are charged with developing new meat products as part of the class requirements.

Beef in Bourbon Stir Fry

This year, **Caroline Wild** and **Gus (Robert) Anderson** developed Beef in Bourbon Stir Fry, a raw product designed to be a quick meal with added onions and mushrooms and served over rice.

Alec Malcolm and **Tom Morton** developed a new twist on carnitas. Their Pork Carnitas were not fried, reducing the fat content of the meal and contained lime and orange flavors along with jalapenos and pasilla chilies to give the product some punch. This product was designed to be shipped raw to retail outlets so that consumers could feel they were cooking the meal.

Pork Carnitas

Joe Evans and **Andrew Arnold** took on the challenge of developing a new lamb product. Their Hotty Totty Lamb Stir Fry utilized Sriracha sauce and curry seasonings to develop a raw ready to cook product. The product used lamb cubes from the shoulder to increase the utilization of an underutilized cut of the lamb carcass. One of the most often requested information about lamb is how to cook it. Joe and Andrew's product gives an option that would not be common for lamb.

Jessica Staffanson, **Eric Lawver** and **Cole Taber** developed a twist on an old favorite. They developed a Jalapeno Cheddar Summer Sausage. This product included dried jalapenos and cheddar cheese to give a little zing to a favorite. They also acidified this product to give it the tang associated with traditional summer sausage from Germany.

Hotty Totty Lamb Stir Fry

These students also had the opportunity to visit Brian Engle of Pioneer Meats in Big Timber. Brian was gracious enough to allow us to invade a work day. He allowed us to use his chopper to make Weisswurst a fine chopped traditional German Sausage. Then he made 200 pounds of hot dogs to show the students what a commercial batch would look like. While there, the students were able to see equipment in use that are not available in the meat lab. Larger versions of stuffing equipment, high speed slicer for bacon, multiple smokehouses and a rollstock packaging machine. Brian also used the class as taste testers on two batches of snack sticks.

Jalapeno Cheddar Summer Sausage

Andrew Arnold, Caroline Wild, Joe Evans, Matt Wood, Alec Malcom, Cole Taber, Gus (Robert) Anderson, Tom Morton and Eric Lawver.

Hello

Dr. Tim DelCurto joined the Animal & Range Sciences staff as Professor and Nancy Cameron Endowed Chair Range Beef Cattle Nutrition & Management in November.

Tim was previously Associate Professor, Director, and Program Head at Eastern Oregon Agriculture & Natural Resource Program, which included two range livestock research stations – Burns & Union Stations, at Oregon State University.

DelCurto has a bachelor's degree in general agriculture, a master's degree in animal sciences from Oregon State University and a Ph.D. in animal sciences from Kansas State University. He has authored more than 60 peer-reviewed articles in animal sciences, authored or co-authored five books, holds 24 years of university teaching experience and has generated $3 million in grant funding.

The position is the department's first endowed chair, meant to develop a rich research profile and program in range beef cattle nutrition and management that serves Montana and the region's beef Industry. The position has been heavily supported by Montana producers and university stakeholders, including a foundational $2 million gift from Nancy Cameron, a descendant from a pioneering ranching family with a 125-year history in Montana and 1954 graduate of the College of Business at what was then Montana State College.

"I'm thrilled to join Montana State University, particularly in a research vein so heavily supported by the university, faculty and the state of Montana," DelCurto said. "There is a wealth of opportunity to investigate and develop answers to the largest challenges facing the livestock industry through advanced research, highly qualified faculty and an integrated network of private producers across the state. I'm honored to serve as the department's first beef physiology chair."

Tim and his wife, Tamara, have three children Hannah, Scott, and Molly. Welcome, Tim!

Goodbye

Dr. Whit Stewart, Sheep Extension Specialist, is heading to the University of Wyoming as their Sheep Extension Specialist. Whit came to MSU in 2015 and has helped moved the sheep program forward through research and community outreach programs. Best of luck to Whit!

Lisa White has been the Accounting Associate IV for the Animal & Range Sciences Department for 10 and a half years. Her husband Ryan was offered a position in Fire Dispatch with the Forest Service in Salmon, ID. Lisa will work to get the department through the budgeting and fiscal year end. We wish her all the best!

Phil Merta, Laboratory Manager, will be leaving the Animal & Range Sciences Department to become the MSU Biosafety Officer. So, he won't be far away! Good luck, Phil!

Jake Heen, Assistant Animal and Farm Operations Manager, is going back to work on his family's farm in North Dakota. Jake, a 2007 graduate of MSU, has been with farm operations since 2008. Good luck, Jake!

Bill Bennett has been the Farm Mechanic for 35 years! He is retiring and plans to do some traveling. Happy retirement and safe travels to Bill!

John Peebles is going back to Choteau, MT to go to work on his family's ranch. John handled a variety of farm operations at Red Bluff that also included assisting with calving and lambing. Good luck, John!

Parting Shot

MSU President Waded Cruzado with some of the Colt Starting Class students.

The mission of the Animal and Range Sciences Department is to create, evaluate and communicate science-based knowledge to enhance the management of Montana's livestock and rangeland resources in ways that are economically, socially and ecologically sustainable.