animal & range sciences newsletter

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So, What's Happening at Our Farms?

They are significant to our teaching. They are vital to our research. They are important to our students. So, what's going on at our farms? Well. A lot. Only for us, it's another day at the office.

Currently at the farms.
The Montana Agriculture Experiment Stations (MAES) are continuing to work towards a new production system. This year will be the last year for calving in February, as it will be moved to May 1st in 2021. This will change how the animals will graze, as well as how they will be marketed. Changing the dates of calving also allows for increased research opportunities by having different classes of cattle, unlike in the past. Additionally, the new production system provides opportunities to be more fiscally responsible and clean up current infrastructure. See more about the changes, including lambing at Red Bluff, on page 13.

On the equine side of things, improvements have been made at the Miller Pavilion. A new roof was installed last summer and the old footing in the arena was torn out and replaced with new footing. Additional work will continue, which will add to the safety and success of the program as well.

That's good news for students currently involved in the Colt Starting class. They will continue training their colts during the spring semester in preparation for the spring sale. You can keep updated through their Facebook page at https://www.facebook.com/msucoltstarting/.

Likewise, the Steer-A-Year program is gearing up for another successful year as over 30 cows have been donated for the program. You can follow progress via their social media at https://www.facebook.com/Steer-a-Year-at-MSU-778518938899976/. See page 19 for more information.

The sheep program at MSU has plans to fully upgrade to EID technology by lambing this year. Electronic ear tags have always been used on the mature ewes, but plans

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From the Department Head

Dr. Patrick Hatfield
Department Head

It was a busy 2019. We had several successful faculty searches during the fall and those new faces will begin to appear in our department over the next few months. The faculty positions for Sheep Production, Ruminant Nutrition and Equine Science were filled. Our new Extension Wildlife Specialist will arrive in April and the search is underway for a new Extension Forage Specialist and Farrier School Director.

Our Department Advisory Committee had their meeting here in October and provided positive feedback for the work we are doing and the direction we are headed.

Our faculty and staff is working diligently to prepare for the department's seven year review. This is a process required by the MSU Board of Regents, but more importantly, it's an opportunity for our faculty and staff to look at the totality of our work over the past seven years and plan for our next seven years. This review is potentially more meaningful and impactful than past reviews. Currently, the average years of service in the department by our tenure track faculty is approximately 16 years. That number is projected to be cut in half by 2025, as new faculty replace recent and potential retirements.

Alumni, advisory committee members, and all those impacted by the research, teaching, and extension work in our department, have a role in this process. On April 23rd, you are invited to the "Department Overview by the Department Head". Then, lunch with the review team, made up of faculty from other universities, as well as MSU faculty and leadership. This is your opportunity to help us not only evaluate our departments track record, but also have input in its future direction. Your invitation extends to dinner Thursday night. In early April, look for our department's self-study document on our web page.

As you will read in this newsletter, we are making changes to our calving and lambing schedules that we feel will create a more productive and successful program for our students, faculty and working farms. Also, our new Ranching Systems Degree was launched this fall with one student accepted into the program. As students begin to declare this major as a freshman, we know it will continue to grow.

And, The Bair Ranch Foundation Seminar Series continues its success of bringing in quality speakers from across the country. We are excited to welcome Dr. Temple Grandin in February for a speaking engagement at The Ellen Theater, which will be free to the public.

So, it looks like 2020 is off to a busy start!

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are under way to integrate all data collection on the sheep using this new technology. Two scales and a stick reader have already been used over the past six months with great success in data integrity and speed of data collection. Also, ninety lambs from Red Bluff are currently being fed at Fort Ellis for use by the MSU Culinary program, so watch for the home raised lamb this spring semester on campus.

Those who make it happen.
Shay Larsen and Tyrell McClain serve as Farm Operations Managers. Shay oversees cattle operations and maintains all animal health and animal use agreements. Tyrell manages equine operations. He additionally keeps track of vehicle/trailer/equipment use and rentals. They both work to manage sheep, farming, and feed, as well as operations at the Fort Ellis and Lutz farms. Both are current graduate students under the tutelage of Dr. Tim DelCurto.

Luka Mueller is originally from Münster Germany. She graduated with a Bachelor's from Montana State University. She returned home to Germany and received a Master's in Animal Science. Luka has recently been promoted to the Livestock Foreman position. She has been a great asset in leading the student labor at all of the farms. Luka will be instrumental in transitioning the town properties from hay production to rotational grazing.

Christine Gluch is another graduate of Montana State University with a degree in Equine Science. Christine is originally from California, but has fallen in love with Montana and the Bozeman area and hopes to continue to make this her home. Christine is currently the Equine Foreman, where she helps lead the feeding crew and assist with herd health of the horses.

JT Saunders is our veteran employee at the farms serving as Red Bluff Manager. JT has been involved with the Montana Angus Association this year and will be working on developing a new grazing system for Red Bluff as we transition to a May calving. JT will also oversee the implementation of the new Sheep Foreman position at Red Bluff.

Changes now.
The summer of 2019 marked big changes for the farms and its operations. According to Co-Farm Manager Tyrell McClain, "These stations were faced with some challenging obstacles that needed some clever answers." For example, as the city of Bozeman continues to grow around the BART and Fort Ellis farms, adjustments and improvements need to be made to keep up with the changing environment. Additionally he adds, "We were charged with the task of transitioning to a purebred operation that fits our resources. As we looked at our challenges and resources, we felt that a change to our production system was in order." Those changes include minimizing farm inputs and utilizing the temperate winter conditions at Red Bluff, as well as taking advantage of the phenomenal summer grass production in Bozeman. This new system will allow all of the farms to work as one team. They will no longer be separated individual stations, but will be managed as a single station with multiple units.

Tyrell says "In transitioning into a new production system, we will be able to develop an opportunity for summer internships that will be extremely beneficial to our students. This internship opportunity would include active participation in all summer ranch work."

Changes for the future.
One of the new programs at BART is with a new purebred herd. Dr. Tim DelCurto has taken the lead on developing a seedstock production course that will be heavily involved in working with farm operations and the seedstock herd.

We have many learning and research opportunities available at our farms, so development and expansion will continue over the years to accommodate the growing student enrollments and programs.

MSU researchers examine benefits of sheep grazing in vegetable farming

Farmers and ranchers have long been in search of ways to limit the need for tillage and chemical herbicides on farmland, and two researchers in Montana State University's College of Agriculture are working on a project that may provide a solution.

With help from the Western Sustainable Agricultural Research and Education program, which is being hosted by MSU until 2023, Devon Ragen, a research associate in the Department of Animal and Range Sciences, and graduate student Trestin Benson have conducted two years of tests on local farms to see if grazing sheep on vegetable or cover crop plots can help improve soil health while reducing artificial inputs to the soil.

"We're looking at differences in microbial communities in the soil and nutrient profiles," said Ragen. "We use sheep for a pre-graze before seeding to clean up all the weeds instead of having to spray or till it up."

Tillage, she said, is one of the biggest detriments to organic farmers. While useful for turning fertilizer and plant matter into the soil, it also promotes wind erosion by making the upper layers of earth easier to blow away. If incorporating sheep into a farming system results in less need for tillage, it would be a win for farmers. Ragen and Benson have partnered with Strike Farms in Bozeman, 13 Mile Lamb and Wool in Belgrade, and Black Cat Farm in Boulder, Colorado; all three farms volunteered to test out their theory and allow sheep to graze their vegetable fields.

Those tests have shown that when sheep were allowed on cropland to eat weeds and leave manure and urine — natural fertilizer — behind, it reduced the need for tillage 60 percent of the time. However, having animals in a vegetable field carries with it the concern of the sheep compacting the soil too much and interfering with seeding and growth. But fortunately, Ragen and Benson haven't found it to be a problem in their farm tests, which is more good news for producers.

"We looked at these grazed organic fields and compared them to tilled organic and chemical fields, and we're not really seeing a big difference in terms of compaction," Ragen said. "From a farmer's perspective, it's not really a detriment to have sheep out there, and we're actually seeing higher nitrogen in the soil after the sheep have grazed, so that's less fertilizer they have to apply and less cost in actually purchasing the fertilizer."

One of the upsides to the project is that it doesn't require the producer partners to change anything in their systems — simply allow Ragen and Benson to take soil samples before and after sheep are allowed grazed on the plots. They do much of their work with a part of the MSU-owned flock of sheep that lives at Fort Ellis Research Farm. For Benson, who began working with Ragen in 2017 while finishing her undergraduate studies, the project has provided an opportunity to adapt based on farmer interests.

"When it started out, we thought it was going to be a cropping systems project," Benson said, but farmers were keen to test the ideas in the context of vegetable farming. "It's evolved into something a little different and unique that way. It's been fun working with the farmers and all their different systems, which gives an interesting perspective."

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In the News

Trestin Benson, graduate student in animal and range science at Montana State University, left, and Devon Ragen, research associate in the College of Agriculture at MSU, have been studying integrating sheep into agriculture systems and examining the benefits or drawbacks to having the sheep graze before or after planting and harvest in crop cultivation.

The SARE program, which focuses on supporting projects dedicated to furthering sustainable agriculture, is the nation's top producer-led grant program in the field. MSU was selected in 2018 as the western regional host for the program, which will bring more than $27 million in grants and operational costs to MSU researchers and graduate students over the next five years. Ragen and Benson's project received a SARE grant in 2017 and they will dedicate the final year of that funding to producing write-ups, tip sheets and videos for producers. They'll also host a workshop at Towne's Harvest Farm in Bozeman on July 25 from 9 a.m. to noon for anyone who wants to learn more about the project and its potential applications.

They hope that their research will offer farmers and ranchers an added level of comfort in pursuing livestock-cropland partnerships in a real-life context. The whole point of their work has been to test a practical option for Montana agriculturalists, refine the process and provide reliable information to communities around the state and beyond.

"As researchers I think it's really important that we can do all the trials and let them know what works and what doesn't so they can feel a little more comfortable going out there and trying it themselves," said Ragen.

by Reagan Colyer, MSU News Service
MSU Photo by Adrian Sanchez-Gonzalez

MSU research team discovers new microbe in wheat stem sawfly

A team of researchers in Montana State University's College of Agriculture has discovered a previously unidentified microbe that lives symbiotically with the wheat stem sawfly, a pest that causes hundreds of millions of dollars in damage to wheat crops each year. The discovery, the result of a years-long project, provides the basis for future research that could be vital to combating losses due to wheat stem sawflies in Montana and beyond.

Carl Yeoman in the Department of Animal and Range Sciences and David Weaver in the Department of Land Resources and Environmental Sciences published a paper in the journal PeerJ in August along with a team of colleagues. The paper outlines the discovery of the microbe Spiroplasma sp. WSS – its name a nod to the wheat stem sawflies in which it was discovered. The project was inspired by knowledge of similar symbiotic relationships between other insects and microbes inside them.

Yeoman said wheat stem sawflies cause as much as $350 million in damage to wheat crops each year in the Northern Great Plains. The motivation for looking into those symbiotic relationships stemmed from a hypothesis that if the microbes in wheat stem sawflies could be identified and their functions determined, maybe they could be manipulated to work as a management tool for sawflies.

"Many insect species have microbial symbionts, and these relationships are often essential to the survival of both organisms," said Yeoman. "Microbial symbionts have been shown to affect everything from the reproductive success of their insect hosts to their nutrition – allowing them to survive on poor quality diets – and even their ability to defend against pathogens."

So, the team set out to determine what microbes are associated with wheat stem sawflies, and if they could be manipulated to affect the sawfly's ability to damage wheat crops.

Wheat stem sawflies are one of the more widespread wheat pests in western North America, said Weaver, damaging wheat by penetrating the stem to insert their eggs. The larvae then eat tissues lining the stem, inhibiting photosynthesis and causing lodging – weakening the stem to the point where the plant simply falls over in large swaths. The project was supported by the Montana Wheat and Barley Committee, which has long been in search of new ways to manage the pest.

"We've reported 20% to 30% reductions in seed weight as a result of sawfly feeding," said Weaver. "But if the stem falls and a combine doesn't pick it up, it goes from a 30% loss to a 100% loss of that stem. It's a pretty big problem, and it really frustrates growers."

Montana State University's College of Agriculture faculty David Weaver observes wheat variations for wheat stem sawfly cutting at a study plot near Amsterdam, Mont., Friday, Sept. 13, 2019. Weaver and associate professor Carl Yeoman are co-authors in a wheat stem sawfly genome study, researching the microbial ecology of the invasive pest.

Other members of the research team included Curtis Fowler of animal and range sciences; postdoctoral researcher Laura Brutscher and undergraduate Furkan

Ibaoglu, who graduated in 2018, of the Department of Microbiology and Immunology; and Kevin Wanner of the Department of Plant Sciences and Plant Pathology, along with researchers from the University of Chicago and the Marine Biological Laboratory in Woods Hole, Mass.

The team began their study by collecting wheat stem sawflies from two locations at the larval and adult stages. They brought those back to their labs and began to examine them, where they observed three types of genomic material in their samples: wheat plant DNA, sawfly DNA and a previously undescribed species of microbe belonging to the genus Spiroplasma.

Based on elements of the microbe's genome in comparison to the sawfly genome – which was fully sequenced through another project Wanner and Weaver worked on – the team inferred that Spiroplasma sp. WSS might help sawflies break down sugars they eat and helping them to manufacture other nutrients they don't get from their carbohydrate-heavy diet, including key B vitamins.

"[Spiroplasma] plays a role in certain functions the sawfly may not be able to do as well by itself," said Weaver. "These functions are what we're trying to understand, and potentially how these things could be adapted, and the role of the symbiont truncated to be used as a potential management tool."

That method has shown potential in other research: A group of scholars working in China examined a similar system in pea aphids and found that when symbiotic microbes were inhibited with the use of antibiotics — or in another case, using scorpion venom — the fertility of the aphids fell significantly, reducing their population and the risk they posed to pea plants. It is possible that similar approaches could be used with wheat stem sawflies and the newly identified Spiroplasma symbiont, Weaver said.

Yeoman and Weaver plan to make future proposals to further their understanding of the role Spiroplasma sp. WSS plays in sawflies and other insects.

"We set out to identify the symbiotic microbes of wheat stem sawflies…so that we could begin to determine if these insect-microbial relationships could be exploited as alternate measures to control WSS damage in crops," Yeoman and Weaver concluded in their paper. "The identification of Spiroplasma sp. WSS and greater genetic insight into its metabolism provide a critical first step toward our pursuit of a novel biocontrol approach."

by Reagan Colyer, MSU News Service
MSU Photo by Adrian Sanchez-Gonzalez

Dr. Carl Yeoman to present at the seventh annual Provost's Distinguished Lecturer Series

One of the most significant honors for faculty at MSU is to be recognized publicly as a Provost Distinguished Lecturer and to provide a talk to a general audience of MSU and community members. Dr. Carl Yeoman has been selected to deliver a lecture on February 2, 2020. The series of free, public talks recognizes outstanding MSU faculty for their creative scholarship and leadership. Faculty presenting in the series will speak on the inspirations for their works in talks aimed at both professionals and the public alike. Carl's lecture, "An Important Microbial Community Lives Within Us All" will be held in the Museum of the Rockies Hager Auditorium at 7 p.m., followed by a reception at 8 p.m. For more information, contact the Office of the Provost at 406-994-4373 or provost@montana.edu.

MSU ranching program seeks partner ranches

The Montana State University College of Agriculture's newest bachelor's degree program in ranching systems is actively seeking partner ranches for student internships. The degree is part of the new Dan Scott Ranch Management Program and provides the academic foundation needed for ranch management while developing students' leadership, business and communication skills.

The Dan Scott Ranch Management Program aims to produce graduates equally equipped to work with landowners or major ranches. It is the only degree program of its kind in the intermountain West, offering students an interdisciplinary combination of scientific information, experiential learning and financial knowledge. The program, which is limited to 10 students per academic year, began accepting students this fall. Students apply to the program during their sophomore year. Those accepted are then matched with a host ranch for a two-year internship.

"The success of the Dan Scott Ranch Management Program is dependent on a close relationship with industry and ranching partners, such as Fay Ranches. Without the ranching community's participation and support of the program, we cannot provide the educational experience that will prepare students to meet the challenges facing tomorrow's managers of investment properties and family ranches."

Dr. Rachel Frost – Program Lead, Dan Scott Ranch Management Program, Montana State University

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The first class of ranching systems students will intern on Montana ranches beginning in May 2020, and the College of Agriculture is seeking additional ranches to partner with the program by hosting interns, as well as suggesting education needs that would benefit Montana's ranching community. "By turning young people's passion for ranching into a profitable profession, the ranching systems degree at Montana State University is carrying the legacy of Montana agriculture into the next generation and beyond," said Rachel Frost, who leads the Dan Scott Ranch Management Program.

Frost joined the MSU faculty earlier this year, specifically to direct the new program. Her background includes research examining the role of grazing in enhancing rangeland health and noxious weed management. She spent six years working with conservation districts along the Missouri River in Montana focusing on local conservation projects, rural community stability and invasive species prevention. "Having grown up on a family ranch and working closely with ranchers my whole career, I am excited about the opportunities for graduates of this program," said Frost. "The ranching community deserves our best and brightest students, and the Dan Scott Ranch Management Program is the perfect conduit to help these students become the ranch managers of the 21st century."

In addition to the undergraduate degree in ranching systems, Frost said the Dan Scott Ranch Management Program will strive to foster an exchange between MSU and the Montana ranching community that enriches the lives of ranching families and improves the economic viability and cultural sustainability of ranches. The program is built on donations from Montana landowner and industry partners. Continued involvement and support will be key to the program's success, said Frost.

For more information about the Dan Scott Ranch Management Program, visit http://animalrange.montana.edu/danscottranchmanagementprogram/html or contact Frost at 406-994-3724 or frost@montana.edu.

ANRS Briefs

Hannah and Sam Wyffels welcomed Grace Madelyn on Saturday, June 22. She weighed 6lbs 15 oz and was 20 inches long! Congratulations!

Jim Berardinelli received his distinguished service award at the 2019 Western Section American Society of Animal Science Annual Meeting held in June.

We are excited to announce a campaign to raise funds in support of an Agriculture Teaching Arena Complex which is designed to expand capacity for teaching, research and outreach activities so that MSU can provide robust learning opportunities for students, youth and the public. Learn more about this project at **www.msuagcomplex.com.**

MSU's Bob Miller Pavilion, built in the late 1960s, has served the College of Agriculture well for the last fifty years. However, with accelerating enrollment in the Department of Animal and Range Sciences, adequate and safe space for animals, students and teachers have become severely limited. As a top-ranked agriculture program nationally, MSU seeks to develop infrastructure that mirrors the growth and leadership of its livestock and equine programs.

Dr. Jan Bowman Retires

After 27 years of teach, Dr. Jan Bowman has retired! The Department of Animal & Range Sciences faculty and staff, friends and family celebrated the retirement of Jan with a potluck dinner, cake and gifts in August. Jan started in Animal and Range Sciences in 1992 and taught Feeds and Feeding, Animal Nutrition and Nutrient Metabolism. The last classes she taught were Topics in Beef Nutrition and Equine Nutrition.

As for her future plans, Jan studied classical piano at the St. Louis Institute of Music, and she wants to get back to playing the keyboard and piano regularly. Other activities she plans on pursuing include spending time with her horses, reading, needlework, taking their CanAm on trails in the mountains, and managing social media for Training for the Cross ministry.

Jan and her husband, David, were presented a custom-made piece of artwork depicting their life on the ranch.

The Bair Ranch Foundation Seminar Fall 2019 Series

The Bair Ranch Foundation Seminar Series brings nationally recognized scientists and agricultural professionals to MSU for the benefit of students, faculty, and the public. The series is aimed at fostering greater public engagement and outreach on innovative research, agricultural, and natural resource issues. Each seminar will include a research talk in an effort to provide meaningful opportunities for professional interactions among nationally recognized agricultural professionals, teachers, and researchers, to the students and faculty of MSU.

For more information, go to http://animalrange.montana.edu/bairranchfoundation.html.

Dr. Erik Beever, Research Ecologist and Affiliate Professor, USGS Northern Rocky Mtn. Science Center presenting on the topic "Synecology of Free-roaming Horses: Multi-scale Relationships with Mammals, Reptiles, Plants, and Soils of Sagebrush Habitats".

Dr. Bill Fagan, University of Maryland Department of Biology Professor and Department Chair, presenting on the topic "Measuring and Predicting Animal Space Use: The Importance of Autocorrelated Movement".

Dr. Fabian Menalled, Western Sustainable Agriculture Research and Education (WSARE) Regional Coordinator, presenting on the topic "Ecological Role of Agricultural Weeds (Besides Yield Reduction)".

BAIR RANCH FOUNDATION

The Bair Ranch Foundation Seminar Spring 2020 Series

We are gearing up for the Spring 2020 series, so check for updates at http://animalrange.montana.edu/bairranchfoundation.html.

We are excited to announce that one of our featured speakers will be Dr. Temple Grandin. She will be in Bozeman February 20, 2020 for a public speaking engagement at The Ellen Theater. We will provide more information as it gets closer, but mark your calendars!

February 20, 2020
The Ellen Theater – Bozeman, MT
Reception at 5:00 pm • Presentation at 6:00 pm
"Understanding Animal Behavior and Autism"
Free to the Public

ANRS Briefs

ANSC 434R Beef Management class and Collegiate Stockgrowers trip to ORIgen on November 5th, 2019.

ORIgen is a company that builds and designs a service system model to give bull owners the ability to collect and market their genetics through a system that is designed for their best interests and returns.

A few of our Animal & Range Sciences students getting ready to ride in the English Pleasure class for the FFA John Deere Ag Expo.

Left to right:
Jolee Akins & Zan
Maddi Lockner & Emmi
Hannah Kaiser & Reed
Ashley Purcell & Olive

Change in cattle management to begin in 2020

After lengthy discussions and input from various people in agriculture education and production, we have made the determination that changing the dates for our calving and lambing seasons will provide an overall benefit the our beef cattle and sheep programs. The new date for calving at BART Farm will be April 15, with the lambing at Red Bluff starting on May 1.

Some of the benefits included:

- Better match to cow's nutritional requirements with seasonal forage conditions
- Lower labor associated with winter calving and feeding will allow labor investment in other areas of operations, teaching, and research.
- Disease mitigation and higher weaning percentage.
- Lower reliance on harvested feeds via extended grazing periods (10 months or more grass goal)
- Research opportunities

This change will have minimal impact on student activities, employment, internships, research projects, courses (beef practicum, steer-a-year, beef management, etc.) and other primary activities such as haying.

New Ranching Systems Degree Officially Launches

The Ranching Systems Degree under the Dan Scott Ranch Management Program has received its first applicants! Fall 2019 was the first opportunity students were given to apply for admission into the program. This unique program starts with students declaring their major as freshmen in order to begin with the foundation building courses. The official application process to the program begins midway through their sophomore year. Because of limited enrollment to the program, students apply via a rigorous application process and the program committee determines who will be accepted into the program. A maximum of 10 students per year will be accepted into the full program each year.

"MORE THAN A PASSION."

Because of the focused, systems approach degree – animal science, rangeland ecology and business – those being admitted should not just have a passion for ranching, but a sincere commitment to making ranching operations profitable and ecologically sustainable. Strategic courses have been developed to lay a solid foundation for this four-year program. The three different disciplines of rangeland ecology, animal science and business are taught through the College of Agriculture and Jake Jabs College of Business.

"ANOTHER SIGNIFICANT COMPONENT – AN INTERNSHIP WITH WORKING RANCHES."

Internships will occur during the school summer sessions of May-August. The goal of this component will be establishing and maintaining mentor/mentee relationships between ranches and students and maintaining this connection beyond summer. Because there are two internship sessions, matching students to a ranch is important. To learn more about how to become a ranch partner, see the article on page 8.

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Because this is an endowed program, it's also supported by donation from ranches for field trips and educational opportunities outside the classroom that showcase day-to-day operations.

"THERE'S A LOT TO MANAGING A RANCH."

The ability to manage a ranch goes beyond rangeland ecology, animal science and "keeping the books". Skills such as managing help, dealing with conflict, working with neighbors, and creating partnerships are not always taught in agricultural programs. This degree will focus on communication skills, problem solving, and conflict resolutions that will inevitably arise when running a ranching operation. Additionally, students will learn how to work with various government agencies and learn about their programs and regulations.

Students accepted into the degree program will also have a continuing education plan once their degree is completed.

As of fall 2019, one freshman has declared Ranching Systems as their major. A sophomore, who applied for the program and was accepted, has been working towards this degree for a year now, and will be an excellent first graduate of the program.

For more information, visit http://animalrange.montana.edu/danscott/index.html or contact the Program Leader, Rachel Frost at frost@montana.edu or 406-994-3724.

photos courtesy of DNRC

Mmmmmm Good - Meat Processing Final Products

As part of the meat processing class each year, the students develop a new product. Must investigate the market and competitors as well as what is necessary to take the product to full production including different types of packaging and equipment. This year the students drew for what species they would be using. In the draw were beef, pork and a wild card. The wild card could choose any species as long as it was readily available. There was a small class this year but the products were still outstanding.

Makae Nack and Brandon Maher developed the Montana Cheesesteak. The students did a twist on the favorite sandwich. The approach was to make preparation of a hot sandwich with beef very easy. Seasoned tri- tip was packaged and frozen in one serving batches. Cooked passila chilies and sweet onions topped the meat. Again in single serving packages. The premise was to supply the meat and veggies ready to prepare. Topped with a cream cheese – horseradish sauce, this product was yummy.

Snack sticks were the order of the day for Mackenzie Knudson and Chyna Drum. The ladies drew the wild card and wanted to work with elk. Firestarter Snack Stick was the resulting product. Using a small portion of pork to give the extra lean elk some fat this stick does not disappoint on the heat. The goal was a product that could be old as an individual serving at any place in the grocery store. Utilizing citric acid as an acidifier and drying the product made it shelf stable and able to market anywhere in the store.

Trase Johnson and Keenan Kvamme wanted cheese in their snack sticks. To make their product stand out in a difficult market they decided to use Hatch green chilies with pepper jack cheese to give it just a hint of heat and balance off the flavor with garlic, chipotle powder, onion and, coriander. Again, the goal was a shelf-stable product. Citric acid was used to lower the pH and product was dried to make it safe to not refrigerate. The flavor of the resulting product leaves many of the commercial products in the dust.

Meat Lab Renovations

Perhaps some of you heard that the meat lab recently had a face-lift. This multi-functional area has not had a major upgrade since it was built in the 1960's. Although the project was funded through student fees, it was also designated for improvements with other MSU teaching spaces.

One of the major changes was reworking the electrical installations to have drop cords from the ceiling. There are two 110 reels, two 220 – three phase and one 220 single phase. Meat Lab Manager, Dr. Jane Ann Boles, said "This replaced one knee breaker that came out of the floor and was about two steps from the wash sink, so everyone was happy to see the floor one removed."

New windows were installed to replace the old ones that could be opened, but let in a whole host of dust and bugs. The new ones do not open so ventilation was installed, including heating and cooling for the room. It is not refrigerated temperatures, but it makes the room usable in the summer months where before, any cutting had to occur in the actual cooler to maintain safe temperatures. New cooler doors, outside doors, a new three-compartment wash sink with sprayer and new floor coatings, were also included in the renovation. This has improved many approaches for teaching.

While these improvements have made a better working and teaching area, the most unique addition for teaching are the two cameras and screens. The cameras allow the work on the cutting table and processing area to be projected on the screens. One screen is above the windows of the office, while the second screen is in the newly enclosed balcony. This allows students not able to participate to still see the process of cutting or processing.

This portion has been used to display videos of cutting and processing that have been shared by a small processor to give the students an example of how this occurs in a Montana plant. It also allows the professor who is short, to show everyone the cutting procedures and describe cuts without holding things up above her head. The cameras have pre-set places to allow for rapid returns to specific places on the table. The screens are also used to show other types of videos such as specific cutting processes that can be found on YouTube or other places on the internet. This expands the ability of the lab to include global approaches to meat cutting and processing.

Dr. Carla Sanford speaking at the Montana Stockgrowers Association and Montana Cattlewomen's Annual Meeting

Dr. Carla Sanford speaking at Winter Feeding Workshop hosted by Hosted by Montana State University Extension Pondera County in Valier. MT.

Dr. Megan Van Emon speaking at Winter Feeding Workshop hosted by Hosted by Montana State University Extension Pondera County in Valier. MT.

Department of Animal and Range Sciences graduate student and Wool Lab Research Associate, Trestin Benson updates producers during the Montana Wool Growers Association Convention on her research using sheep in commercial vegetable production systems.

Steer-A-Year Program

The fall semester was a busy one for the Steer-a-Year (SAY) program. Thirty four steers were donated and a maximum enrollment of 25 students are involved in the SAY class.

Program Coordinator, Hannah DelCurto says, “We had a great group of students ‘rounding up’ steers this fall and we were also busy in the classroom. Thank you to all of our guest speakers that presented from Ryan Goodman with NCBA to Paul Dykstra with Certified Angus Beef.” In addition to classroom activities, students also took part in a celebration of Montana agriculture held at the MSU dining halls. Students were able to serve Steer-a-Year beef and engage with other MSU students about the importance of agriculture. Hannah adds, “A big thank you also goes to Elanco Animal Health (Cory Boswell) for supplying us with vaccines as well as CHS (David Miller) for facilitating feed delivery and designing and donating our supplement pellet.”

The steers were started on feed the first of December and are currently on 45% corn/finisher pellet ration and will be worked up on feed through the month of December. Three more steers will be making their way to campus, so once all the steers arrive to the BART farm location and are established on feed, they will move to the GrowSafe units and students will begin collecting data on individual feed intake and efficiency.

2020 Steer-a-Year Donors

Dearborn Ranch LLC
BART Farm
KG Ranch
Cooper Hereford Ranch
Bradley Livestock
EL Peterson Ranch
Mike McCauley
Veseth Cattle Co
Koss Land and Cattle Inc.
Triangle Land and Livestock
Bair Ranch Foundation
Shadow Mountain Ranch
Walborn Cattle Co.
Hearts Coulee Company
Cowan & Son
Northern Ag Broadcasting
Northern Ag Research Center

Gateway Simmental LLC
Rumney Ranch
JD Vukonich
McRae Family
Mark Harrington
Ferrat Ranch Limousin
Red Lodge Creek Ranch
Mark and Kristine Mahlen
Flynn Ranch
Plymale Ranch
Fort Keogh
Dynneson Ranch & Feedlot
Butch and Doreen Gillespie
Gary Adams
Skattum Ranch
Deseret Ranches
P&J Ranches, Inc.

Sheep Program

2019 Wool Harvesting School

The 2019 Wool Harvesting School was held at the Hollenbeck Ranch in Molt, MT on December 12-14, 2019. Students went on a tour at the Center of the Nation Wool hosted by Scott Lammers. A special thanks to Henry and Sarah Hollenbeck for hosting this year's school. Sponsors also included Arrow Livestock and High Five Meats.

Instructors for this beginning school were Per and Barb Gunness, Garrett Harrington, Ralph McWilliams, George Kerr, Brent Roeder and Mike Schuldt. The Laurel FFA program stopped by to visit with the team about the wool industry. The ability to provide these important programs would be not possible without the continued support of Montana Woolgrowers and MSU Extension. Thank you!

Sheep Program

2019 Wool Harvesting School

Sheep Program

Attendees at the 2019 Montana Woolgrowers Convention in Billings, MT were treated to a sheep practicum competition put together using sources from the MAES Wool Lab, MSU Extension and the Department of Animal and Range Sciences. For early December, the weather was perfect.

Station 1 (top left) – Participants had to guess the weight of a bale of wool, guess it's average micron and yield and using smart phones, determine the current price on the AWEX and current AU/USD currency conversion, calculate a value for the bale.

Station 2 (bottom left) – Pick the heaviest and most valuable fleece out of 4 and guess the micron on the last fleece.

Station 3 – In a pen of four live lambs, pick which one would hang the heaviest carcass, calculate the average weight of the pen and then using their smart phone again and looking up the last sale at PAYs, calculate a total value for the pen.

Station 4 (bottom right) – Out of 4 lamb shoulder chops, pick the chop with the least and best value.

Senior winners were Mike Schuldt and Mike Green, intermediate winners were Leah Johnson and Weston Brown and junior winners were Rhylee and Burleigh Diehl.

Sheep Program

The Sheep Advisory Committee visited the farms at Montana State University - Ft. Ellis Research Farm, BART Farm and Red Bluff Research Farm.

The first annual All Things Sheep program. Brent Roeder, MSU Extension Sheep and Wool Specialist co-taught a day long program covering parasite management, FAMACHA scoring, EID technology, scrapie requirements, working facilities, irrigation equipment and pasture management. With close to 60 producers attending at different points, there was a wide diversity of experience and operational size to share knowledge. A big thank-you to SARE for providing the grants to cover some of the costs and the Roeder family for donating the lamb.

FALL 2019

Doctor of Philosophy

Megan Milligan

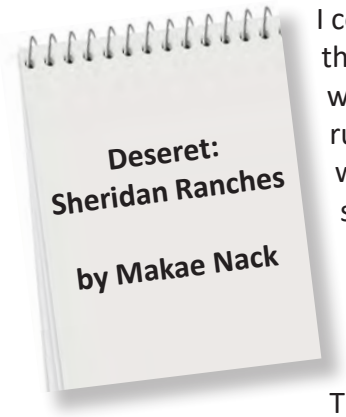
Bachelor of Science in Animal Science

Mackenzie Blatter
Makae Nack
Isabella Pape
Callie Rohl
Nikole Ronneberg
Kayla Stanek

Bachelor of Science in Natural Resources and Rangeland Ecology

Tyler Bain
Amber Giesick
Weston Helle
Carson Kane
William Purdy
Cooper Schicke

Internship Highlights



I completed my animal science internship in North central Wyoming near Clearmont on the Buffalo Creek unit of Sheridan Ranches. This ranch consisted of three units and each was fully stocked this year to bring the total head to about three thousand. This operation runs exclusively range cattle over three years of age. Everything calves on the range with little to no supervision. Very rarely have they fed hay in the winter but cows are supplemented with protein blocks. There are exceptions of course; last winter was a very difficult one with lots of snow and cold and the cows required some extra energy, and one winter quite a few years ago when grasshoppers greatly affected the feed in their winter pastures. Cows calve by themselves and every few weeks they ride through and pull heavies (cows who have not calved) and move them to a different, clean pasture. This was done to create branding groups of a manageable size in both calf number and physical size, it also was done for grazing management reasons. I arrived in early May, just in time to help pull heavies in a few herds. Calving was done considerably later when calving on the range, and for a few good reasons. With minimal supervision it is very difficult to effectively drop live calves in the cold of winter, and calving later allows for green up of grass for the cows to have easy energy and nourishment before the calves arrived.

Being located on the Buffalo Creek Unit I worked pretty exclusively with Tel Mack. We worked five or six days a week and put in roughly fifty-five to sixty hours a week. They were not the longest hours but they were hard and well-earned hours. When cows needed to be moved or brandings occurred all three guys overseeing the units, that included Brent Winters, Tel Mack and Scott Carlson, as well as myself would work together, but most of my time was spent on the Buffalo Creek Unit. My duties included a wide array of jobs typically found on a ranching system. Cows were moved horseback so I spent plenty of time riding and seeing the beautiful country.

Nearly every day for two and a half months I saddled a horse in the calming dark before the morning. Most of those days were cold and rainy or sometimes even snowing but finishing a job in miserable weather seemed to make me feel more accomplished and a little tougher. When branding season finally arrived I was eager to learn how to rope and smell the burning of hair and hide. I was able to do every job on the ground crew, this included running the nordforks, tagging, vaccinating, branding, and cutting. Roping was a little difficult for me at first but once I figured it out I became pretty good, and missed it once branding was over. Water was drawn from wells and pumped to storage tanks, the pumps were set to a timer, the water would then flow to stock tanks via gravity. Sounds simple and it is but plenty can go wrong and they needed to be checked often, and once the temperature surpassed ninety degrees we checked them every day. Once it warmed up we check the storages and tanks every morning, I checked East of the county road and Tel checked West of it. Riding and cow work slowed in July and August and that meant working on projects, more specifically fences. Tel took great pride in a good fence and together we tore out a quarter mile of it and rebuilt it. By myself I tore out another quarter mile and we rebuilt that stretch as well, it sure felt good to see it up when we were done. Even though we worked on other projects Tel and I still rode through his cows every week to look for any sick calves or cows and to check the bulls and put out salt and mineral.

I was not faced with too many obstacles, most of my decisions arose when moving cows. These included where I needed to go and be, how to move the cows, how hard do I push them, reading the cows and knowing what they were going to do and being able to prevent wrecks. Sometimes I needed to decide how long I needed to set the timer to run on the wells or if the cows needed more mineral. There was one weekend when Tel was gone and

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a gnarly thunderstorm came through just North of us and knocked a connector bracket off on a powerline so I had no power to run my wells. I took initiative and called the power company and got it taken care of but I will admit there was a little panic involved. In the middle of my stay Scott Carlson (overseeing the third unit) quit and left us with more work and cows to split between the three of us left. It was a time when I had to step up and do more work by myself, help Brent more and learn to become quicker at my task at hand. Towards the end of my internship Tel and Brent were faced with a huge decision. Grasshoppers had invaded and eaten down way more grass than anticipated and cut down their grazing by roughly three weeks. They were scrambling trying to decide if they should spray, graze winter pasture, ship early or feed hay and supplement. I do not know what they decided but if it was me in that situation, I would try to ship early and if not, supplement with hay and energy.

My learning objectives included; learning new ways as well as improving my cattle moving skills, understand and discover new corral systems and setups, and understand different water systems. During the second week of my internship, Randy Hunter, a well-known cattle handler, came out and went over cattle handling and moving procedures. I took away plenty of awesome and useful information and knowledge that has helped me improve myself and my horses. He really pushed how important it is to start cattle right, by being calm, patient and letting the cows pair up before you start a drive. Not to mention the importance of “rewarding” the cattle for moving in the right direction by relieving pressure on them by moving side to side behind the cattle and even stopping and letting them move in the right direction on their own. When it came to corrals, Bud Williams was a huge influence and they used a lot of his techniques and corral set ups. Bud boxes were used behind the alleyway leading up to the chute. They also utilized curved alleyways leading to the chute and silencers for the best “experience” for the cattle. One corral in particular was discussed a bunch when Randy Hunter was here. It had a round pet to sort in, which makes sense because cattle like to move in circles. It also had a calf screen so calves could slip out on their own, into a different pen. They also talked about making additions to the corrals and how it would make it easier to load the round pen if they added an A Box leading up to the alleyway. Tel also talked to me about adding another alleyway next to a separate alleyway to allow for calf sexing right away once they are sorted off the cows to make things move along faster and allow for more places to hold cattle. Understanding the water system was a hands on, learn on the go deal. Tel had showed my lines and storages and explained things to me but to truly understand it, I needed to just go out on my own and do it.

In the end I gained so many great experiences. From moving cattle in June snow storms and learning to adapt to the weather and working with it to move cows; to learning how to rope and knowing to watch the calf, not my horn and what to do when I pantyhose the calf or it runs at my horse; to climbing steep, rutted up hills loaded down with bulls, because of Tel and Brent I know what to do in those situations. In turn they gained an intern that stepped up when they were a cowboy short and helped with more cows, more water, and more grass. Not to mention I already had previous ranching experience and that saved them time and effort in having to train me. A few areas that I am weak in and would need more guidance would be financials and range observation and grass management. I did have the opportunity to go over the financials with Brent and Tel one morning but it was a quick run-down. If we had more time I would have liked to sit down and go more in depth and include examples to truly get a grasp of how they finance and budget. In terms of range management Tel, Brent and I went on a grass tour towards the end of my internship and we discussed how to evaluate and guesstimate pounds of forage and determining AUM’s. But, in the end my hard work ethic, willingness to try, and previous ranch experience helped me be successful wherever Brent and Tel put me. If I had the opportunity I would go back and work for them again. It was a fun learning curve in beautiful country with two extremely smart mentors.

Internship Highlights

Blue Sky Ranch

by Destiny Peickert

Blue Sky Ranch was purchased over fourteen years ago by Barb and Mike Phillips. After all that time they finally opened up to the public with a brewery and hotel on the ranch. I had the pleasure of being allowed to learn and assist on the ranch side with educating guests about horses and teaching them the basics of riding.

When I first arrived on the ranch our time was spent getting horses ready for guests. This included riding the new ones out on the trail, working with our hands being around their eyes and on their muzzles and arena riding. Most of my time was spent with lead guides and the other wranglers. We averaged forty hours per week with our day starting at eight in the morning until four in the afternoon. When we were not riding, we cared for the horses. This included soaking grass hay for some of the ranch horses that needed less sugar in their diets, and graining which included supplements we had to ensure some of the horses received.

Some of the assignments I was given were ones to be completed after hours. With me and the other intern living on the ranch, we were assigned med deliveries and night feedings if they were needed. One horse needed antibiotics after hours for a couple weeks, and on some days when we were sent home early due to the heat the other intern and I would have to go back in and feed. This would all be done independently and with no supervision. The more things we did the more the owners began to trust us, which led to more responsibility. I was soon allowed to take guest rides out and assist with the children programs.

During my time with the children programs, I did not have a manager around to guide me and worked with the counselors to build a teaching program for the kids. My role in the whole thing was setting up an age appropriate obstacle course for the kids to ride through. I set up weaving cones, logs to cross, an alley with bends to walk through, and bridges to cross. From the opinion of the children it was a success and they all enjoyed their time in the program that day, and the program has continued to use my pattern since then.

My overall goal of this internship was to interact with people and take myself out of my comfort zone. My objective is as follows; “Improvement of hospitality skills in relation to guests. I would like to improve my social skills with the guests so that I can do my best to make them feel valued and appreciated when they are performing an activity that is new to them and make them feel more comfortable”. I interacted with a lot of the guests both being children and adults and speaking with both was a challenge in different ways. Children you had to be cautious with what you said altogether, whereas the adults you had to be cautious to not generalize them into a common group and make them feel very important out of the hundreds of guests on the ranch per day.
One guest I remember very clearly; she and her daughters came to the ranch to ride horses. We did not know until they arrived that the mother had not been on a horse since she had been thrown from one. I spent quite a bit of time with her before the ride talking through what had happened to her in the past. At one point she was about to back out, but in the end, she went on the ride with her two daughters and had a fantastic time. Out of everything I did this summer, I found this interaction to be the most rewarding because I helped someone get over a fear with a positive outcome.

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Internship Highlights

We also did a lot of cowboy greetings; these were less intimate then the trail rides. They were fast and you saw a lot more people in the span of an hour then you did all day with the trail rides. I had to be quick with my responses but yet still thoughtful and had to mix up my greetings so as to not sound redundant to the guests.

My second objective was “improvement of equestrian skills under the training methods seen fit by the ranch, and safety when riding with inexperienced riders. Integration of my equine knowledge into teaching guests about horse behavior and safety, along with riding skills”. I met this objective when the ranch’s trainer came to Utah and held a clinic to teach the wranglers different ways to keep the guest horses on their feet which included moving the front quarters and the hindquarters in different ways, and little tricks we can use on the trail to slow quicker walking horses down without guests noticing.

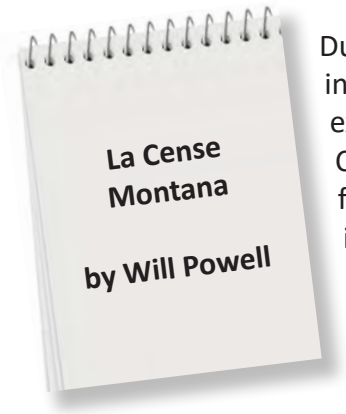
My final objective was to “develop the ability to act as steward for the horse through the utilization and integration of knowledge, critical analysis of standards of operation, and ethical decision-making. Demonstrate the understanding of general horse knowledge, care and maintenance”. I spent a few days out of my time at Blue Sky with the vet, and it was one of my favorite things because I could expand my home knowledge of what to do in situations where a vet was not needed.

We dealt with a lot of scratches early in the summer because of all the rain and mud. The vet described it as a fungus from all the moisture which caused open wounds on the back of the legs. She had a simple treatment that I could do from home if I were to have a horse with scratches, and that treatment was honey. She cleaned the scratches first and then coated them with honey and wrapped them to hold the honey in for a few days.
The one situation that we had to deal with that was completely new to me was when one of the horses developed colic. We had to rush him to an offsite vet. Before we took him, we gave him a dose of banamine and walked him around. The Blue-Sky vet listened to the cecum where there should be a large gurgle every three minutes and she wasn’t hearing anything, which indicated there was an impaction somewhere.

My summer at Blue Sky was rewarding and I enjoyed my time with the company and their employees. I benefited from my internship with Blue Sky by interacting with guests. My job in Montana limits my interactions with people and Blue Sky gave me an opportunity to broaden my skills with communication and even provided a training session with Forbes on how to properly address and talk to guests. I feel that Blue Sky benefited from my assisting them with their grand opening and getting the horses ready for guests in the years to come. I worked hard to keep the facility in its best shape with the other employees.

Educationally I feel I still need more work on communicating with people in a professional manner but this summer I feel I made improvement. I also need to work on my patience when it comes to the process and routines a company performs and understand that it may not always be what I believe is correct with animals. My knowledge of horses helped me the most in this internship. What I know about them anatomically helped me communicate with the vet and educate guests on simple facts.

Internship Highlights



During the month of May I was fortunate enough to work for La Cense in Dillon as an intern. This was a great opportunity and I have gained a lot of practical and hands on experience on intensive grazing and how to run a large commercial ranch. While at La Cense I was horseback most every day. At this time of year, we were busy gathering cattle from winter pastures and feedlots to bring them to the processing corrals where we put in ear tags, gave shots such as respiratory vaccines, internal wormers and took EID data.

Once the cattle were processed, we would trail them to summer pastures on the pivots surrounding the headquarters and begin the process of intensive grazing. We spent most of our days after everything was out on grass checking pastures and doctoring cattle with pink eye and hoof rot. Just before I was done with my internship we just started branding. We would gather cows and calves and sort the calves from the cows and rope and drag calves to be branded, given vaccinations, and record each calves ear tag number and sex of each calf.

I am very grateful for the people I was able to work with at La Cense. Race King was great to work for and with, he was a great boss and couldn't have welcomed me in any better. I worked with Race mainly in the processing corrals and in the office when he was showing me details about the ranch and record keeping. There were also several other people I had the privilege to work with. There are three full time cowboys. Ted, the head cowboy, Bob and Ivan the other two cowboys and I would work with these guys when we were gathering or doctoring cattle. I also was able to work with my two friends Carson and Coby King. We spent just about every day together doing several different things such as doctor cattle in the pasture, move fence, put out salt, process cattle, and sort cattle, or whatever Race told us to do. This was a very helpful and fun internship. We did work a lot. I averaged 10 hours per day with some days working 13-14 hours. I finished my internship with a little over 150 hours which at La Cense wasn't too difficult to accumulate this many hours with as much as we were working, which was good.

I was given several assignments to complete. My biggest assignment was to ride health on cattle in the feed lot and out on pastures. This is truly a very important task because if this job is not done well it can lead to a lot of different consequences from cattle possibly dying, becoming permanently lame or blind. If this happens, the cattle will not sell with the other ones and the La Cense would have to take a big deduction in how much they sell them for, and this can be detrimental if it happens to too many cattle. There can be many obstacles in keeping everything healthy. Some obstacles can be the environment, number of cattle to look after, and type of sickness. For example, while I was at La Cense there was a pasture with an abundance of prickly pear cactus, and this was very hard on cattle's feet and caused more than usual hoof rot steers that needed doctored. Knowing the environment they were in we would check that group of cattle more often when we brought them back to summer pasture. Another task Race had me do was to enter in data on which cattle we doctored, what we doctored them for, and what medicine we used. This was done in the office every day on the computer to ensure accurate data on every animal on La Cense. The other thing that was done on the computer was to record what cattle were fed in the feed lot. This was done to record

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whose cattle were being feed how much feed so they could bill those people for exactly what their cattle ate. This was a pretty straight forward task, I just had to be sure to get on the computer every day after work to record data.

I had 4 learning objectives I wanted to focus on during this internship and they're listed below.

- Objective 1: Intensive grazing – To learn how, why, and practices of intensive grazing. Identify the pros/cons and what operations it works well on.
- Objective 2: Record keeping/software use – Understand and work with the process of natural ranching. How to use new technologies to the benefit of the producer. Keep detailed health and pedigree records of cattle.
- Objective 3: Processing and cattle work – Learn new and different techniques of working, handling and processing cattle and why.
- Additional Learning Objectives – Data collection with EID – Understand how to implement, use and make predictions with the data collected and how to market cattle with the help of EID.

With objective number one I have found that intensive grazing works best on flat irrigated pastures. At La Cense the practice is to graze the grass down to about 6 inches and then move to the next pasture. This is done to ensure over grazing doesn't occur as well as to keep grasses growing so they can be utilized again. One downside to this method of intensive grazing is the large use of water. In areas with low water levels or low irrigation this would be a hard method to use.

I was very impressed with La Cense use of technology and record keeping. I was truly amazed how they keep track of animals who have been treated for any illness, as well as feed records and pasture records. They use an online program that all the cowboys have on their phones so when they doctor something, they record what the animals number, sex, lot number, illness, and treatment. This program records the date and how long until that animal needs to be treated again and how long before it can be harvested.

At La Cense cattle were worked very similar to how I have worked in the past. The major difference, however, was that they use Bud Box's rather than a tub with a swinging gate. The Bud Box worked very well. Cattle are worked very calmly with low stress, this doesn't mean zero stress but low stress and this was part of having good cattle that would gain well and sell well.

This was a great experience for me and my future. I benefited from this internship by experiencing different ways of working cattle and how to run intensive grazing practices. Not only that but it gave me more experience somewhere other than on my family ranch in St. Ignatius, MT. I also gained several new and long-term friends that were great to work with. I hope Race benefited from me being there and I wasn't a burden for him and his workers. I don't believe I was a burden because we were busy everyday with working long hours.

Something that really stuck with me about intensive rotational grazing was the fact that by doing this we can improve pastures with more organic matter in the soil, eliminate weeds by cattle being forced to graze them and trample them as well as get more production out of our pastures. This really lowers our costs by not feeding cattle as long and being able to utilize pastures longer in the short term and long term.

Publications and Presentations

Community and Ecosystem Ecology

Ground-Dwelling Arthropod Community Response to Livestock Grazing: Implications for Avian Conservation

Hayes Goosey presented his publication *"Ground-Dwelling Arthropod Community Response to Livestock Grazing: Implications for Avian Conservation"* at the 2019 National Wildlife Society meeting in Reno, NV.

The publication can be found at https://academic.oup.com/ee/advance-article/doi/10.1093/ee/nvz074/5521234#supplementary-data.

Publications from Dr. Lance McNew and the Wildlife Habitat Ecology Lab:
[† indicates MSU A&RS graduate student]

Milligan, M.C.†, L.I. Berkeley, and L.B. McNew. In press. Effects of rangeland management on the nesting ecology of sharp-tailed grouse. Rangeland Ecology and Management, accepted 8/21/19.

Vold, S.K. †, L.I. Berkeley, and L.B. McNew. In press. Effects of livestock grazing management on grassland birds in a northern mixed-grass prairie ecosystem. Rangeland Ecology and Management, accepted 7/23/19.

Wyffels, S.A.†, M. Petersen, J. Bowman, D. Boss, and L.B. McNew. In press. Dormant season grazing of northern mixed grass prairies: the effect of supplementation strategies on heifer resource utilization and vegetation use. Rangeland Ecology and Management, accepted 7/19/19.

Milligan, M.C.†, and L.B. McNew. 2019. Effects of scavenging on assumptions of mortality analyses of radio-marked gamebirds. Northwestern Naturalist 100:197–205.

Ritter, T.D.†, C. Gower, and L.B. McNew. 2019. Habitat conditions at beaver settlement sites: implications for beaver restoration projects. Restoration Ecology, early view: doi: 10.1111/rec.13032.

Ritter, T.D.†, and L.B. McNew. 2019. Age-mass relationships for beavers in Montana. Intermountain Journal of Sciences 25:45–50.

Wells, S.L. †, L.B. McNew, D.B. Tyers, F.T Van Manen, and D.J. Thompson. 2019. Grizzly bear depredation on grazing allotments in the Yellowstone Ecosystem. Journal of Wildlife Management 83:556–566.

To see more from Dr. Lance McNew and his students, visit https://www.wildlifehabitatecologylab.com/research.html.

WILDLIFE HABITAT ECOLOGY LAB

Publications and Presentations

Conference Presentations/Papers from Dr. Lance McNew and the Wildlife Habitat Ecology Lab:

McNew, L.B. and M. Milligan. 2019. Grazing management for prairie-grouse. 33rd Meeting of the Prairie Grouse Technical Council, Bartlesville, OK.

Milligan, M., L. Berkeley, and L. McNew. 2019. Effects of rangeland management on the ecology of sharp-tailed grouse. American Fisheries Society & The Wildlife Society Joint Annual Conference, Reno, Nevada.

Milligan, M., L. Berkeley, and L. McNew. 2019. Effects of flushing on nest survival of sharp-tailed grouse. American Fisheries Society & The Wildlife Society Joint Annual Conference, Reno, Nevada (poster).

Leipold, L. *, C. Gower, and L. McNew. 2019. Developing methods for estimating density and abundance of dusky grouse for unbiased population monitoring. American Fisheries Society & The Wildlife Society Joint Annual Conference, Reno, Nevada (poster).

Milligan, M.*, L.I. Berkeley, and L.B. McNew. 2019. Importance of the spatial scale of heterogeneity for sharp-tailed grouse in mixed-grass prairie. Annual Meeting of the Ecological Society of America, Louisville, Kentucky.

Macon, L.K*., M. Milligan, and L.B. McNew. 2019. Using ecological site condition to evaluate habitat selection by sharp-tailed grouse broods. 56th Annual Conference of the Montana Chapter of The Wildlife Society, Helena, Montana (poster).

Milligan, M.*, L.I. Berkeley, and L.B. McNew. 2019. Effects of rangeland management on the ecology of sharp-tailed grouse in mixed-grass prairies. 56th Annual Conference of the Montana Chapter of The Wildlife Society, Helena, Montana.

Milligan, M.*, L.I. Berkeley, and L.B. McNew. 2019. Effects of flushing on sharp-tailed grouse survival. 56th Annual Conference of the Montana Chapter of The Wildlife Society, Helena, Montana.

Leipold, E.*, C. Gower, and L.B. McNew. 2019. Predicting habitat suitability for dusky grouse in Montana. 56th Annual Conference of the Montana Chapter of The Wildlife Society, Helena, Montana (poster).

Pulliam, J.*, and L.B. McNew. 2019. Assessing habitat quality for four grassland songbird species of concern in northern mixed-grass prairie. Milligan, M.*, L.I. Berkeley, and L.B. McNew. 2019. Effects of rangeland management on the ecology of sharp-tailed grouse in mixed-grass prairies. 56th Annual Conference of the Montana Chapter of The Wildlife Society, Helena, Montana.

Haynam, R.*, J. Carlson, P. Gunderson, M. Borgreen., and L.B. McNew. 2019. Delineating important seasonal habitats of greater sage-grouse in north-central Montana. Milligan, M.*, L.I. Berkeley, and L.B. McNew. 2019. Effects of rangeland management on the ecology of sharp-tailed grouse in mixed-grass prairies. 56th Annual Conference of the Montana Chapter of The Wildlife Society, Helena, Montana (poster).

Publications:

Yeoman CJ, Brutscher LM, Esen Ö, İbaoğlu F, Fowler C, Eren AM, Wanner K, Weaver DK. 2019. Genome-resolved insights into a novel Spiroplasma symbiont of the Wheat Stem Sawfly (Cephus cinctus). PeerJ 7:e7548 DOI: 10.7717/peerj.7548

Publications and Presentations

Ishaq SL, Lachman MM, Wenner BA, Baeza A, Butler M, Gates E, Olivo S, Geddes JB, **Hatfield P**, **Yeoman CJ**. 2019. Pelleted-hay alfalfa feed increases sheep wether weight gain and rumen bacterial richness over loose-hay alfalfa feed. PLoS One 14: e0215797. DOI: 10.1371/journal.pone.0215797

Ishaq SL, Seipel T, **Yeoman CJ**, Menalled FD. 2019. Soil bacterial communities of wheat vary across the growing season and among dryland farming systems. Geoderma. In press.

Sanglard LP, Schmitz-Esser S, Gray KA, Linhares DCL, **Yeoman CJ**, Dekkers JCM, Niederwerder MC, Serão NVL. 2019. Investigating the relationship between vaginal microbiota and host-genetics and their impact on immune response and farrowing traits in commercial gilts. Journal of Animal Breeding and Genetics. In press. DOI: 10.1111/jbg.12456

Gomez A, Sharma A, Mallott E, Petrzelkova K, Robinson CJ, **Yeoman CJ**, Carbonero F, Pafco B, Rothman J, Ulanov A, Vlckova K, Amato KR, Schnorr S, Dominy N, Modry D, Todd A, Torralba M, Nelson KE, Burns M, Blekhman R, Remis M, Stumpf RM, Wilson BA, Gaskins HR, Garber P, White BA, Leigh SR. 2019. Plasticity in the human gut microbiome defies evolutionary constraints. mSphere 4: e00271-19 DOI: 10.1128/mSphere.00271-19

Borgogna JC, Shardell MD, Santori EK, Nelson TM, Rath JM, Glover ED, Ravel J, Gravitt P, **Yeoman CJ**, Brotman RM. 2019. The vaginal metabolome and microbiota of cervical HPV-positive and HPV-negative women: a cross-sectional analysis. British Journal of Obstetrics & Gynecology. In press. DOI: 10.1111/1471-0528.15981

A synthesis paper coauthored by **Jeff Mosley** received the Editor's Choice Award for the most influential article published in the November 2019 issue of *Rangeland Ecology and Management*. The article was entitled, "Targeted Livestock Grazing: Prescription for Healthy Rangelands".

MSU Extension, the Montana Department of Natural Resources and Conservation, the US Forest Service, and the Bureau of Land Management recently updated the Memorandum of Understanding for the Section 8 Process in Montana. The name of the process and its statutory authority are derived from Section 8 of the Public Rangelands Improvement Act of 1978. The MOU details the procedures that Montana ranchers should follow when seeking third-party assistance to resolve conflicts on livestock grazing allotments managed by the BLM or Forest Service. To initiate the process or to get more details, ranchers should contact **Jeff Mosley**, MSU Extension Range Management Specialist (jmosley@montana.edu).

Jeff Mosley, **Rachel Frost** and three others coauthored a revised edition of "*Monitoring for Success: Official Handbook for the Montana Rangeland Monitoring Program"*. The handbook describes monitoring methods that are simple to learn, quick and easy to use, and provide reliable and useful information for adaptively managing livestock grazing on Montana rangelands. The statewide monitoring program is backed by a new Memorandum of Understanding among several federal and state agencies that ensures the methods in the handbook will be used whenever an agency asks or requires Montana ranchers, lessees, or permittees to monitor grass utilization, residual stubble height, streambank trampling, rangeland health, or ground cover.

Whitney C. Stewart, **Jane A. Boles**, Thomas W. Murphy et al.: "Effects of feeding juniper as roughage on feedlot performance, carcass measurements, meat sensory attitudes, and volatile aroma compounds of yearling Rambouillet wethers 1,2," Journal of Animal Science.

Awards, Honors, and Grants

Grants:

McNew, L.B. Fatal attraction for an imperiled songbird: is cropland in the northern Great Plains an ecological trap for McCown's longspurs? National Fish and Wildlife Foundation. $194,643. May 2020 – May 2023.

McNew, L.B. Suitability of grassland habitat for lesser prairie-chickens after restoration. Turner Enterprises, $91,418. July 2019–June 2022.

Carl Yeoman was awarded $68,000 by the Bair Ranch Foundation to investigate the capacity of microbes identified in the calf rumen whose presence corresponds to immune maturation for their ability to protect animals from infection and disease.

Carl Yeoman was awarded $48,000 by the National Institutes of Health to continue his work to improve the reproductive health of American Indian and Alaska native women

Carl Yeoman was awarded $70,500 by the University of Maryland to explore the microbial and biochemical factors increasing the susceptibility of women to sexually transmitted infection.

Carl Yeoman was part of a team led by Mary Miles (Health and Human Development) that was awarded $160,000/ year for up to 3 years by the USDA to investigate the interplay between consumption of dietary pulses and gut microbes in ameliorating inflammation associated with obesity.

Carl Yeoman and **Craig Carr** were awarded $71,913 by the Bair Ranch Foundation to isolate gut bacteria from wild rumen samples capable of detoxifying larkspur and testing their ability to protect range cattle.

Jane Boles, ARS: "Dry Ageing of Lamb to Improve Flavor Consistency," The Bair Ranch Foundation grant.

Carl Yeoman was appointed as an Editor of Nature's Scientific Reports journal.

SCIENTIFIC REPORTS

You can connect with the Animal & Range Sciences department via a variety of social media sites based on your interests or needs. They are also great ways to keep up to date with our activities and current news. We encourage you to check out the options at http://animalrange.montana.edu/socialmedia.html and interact with us by posting a question or comment. We'd love to hear from you!

Hello

Dr. Jared Beaver has accepted the position of Extension Wildlife Specialist and will begin his new position on April 1, 2020. No foolin'!

Chris Posbergh accepted the position of Assistant Professor of Sheep Production. Chris' official start date is August 16, 2020.

Amanda Bradbery will join our department on August 16, 2020 as Assistant Professor of Equine Science.

We are excited to welcome these new faculty members! Congratulations and welcome to MSU and the Animal & Range Sciences Department!

We are looking for other news faces to join our department in 2020, so stayed tuned!

Goodbye

Ben Wheaton, Lab Manager, is moving to Sweden for a Postdoctoral Fellowship at Umeå University. Good luck, Ben!

Tracy Ross, Equine Facility Manager, accepted a job back in Texas and will be closer to family.

Arianne Perlinski has left her position at BART Farm to pursue other opportunities.

Parting Shot

A peaceful landscape. This picture was taken by **Makae Nack** during her internship at **Deseret: Sheridan Ranches.**

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.