

ANIMAL & RANGE SCIENCES NEWSLETTER

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Introduction from Dr. Glenn Duff, Department Head



Welcome to the latest edition of the Animal and Range Science Newsletter. As I prepared this Introduction, I continue to be amazed at everything that is being accomplished by our program. Items in the newsletter highlight teaching, research, and Extension programs. There is never a dull moment around here, in the Animal & Range Sciences Department.

We recently highlighted undergraduate and graduate students who completed their degree at our departmental annual celebration. We had 7 graduate students and 45 undergraduate students graduate this academic year. As part of our appreciation to all of the work these students have completed, we host a celebration the day before commencement with students and their families. I personally would like to thank Denise Thompson and Peggy Kelley for organizing the event. We continue to receive positive feedback from students and their families about the event. We would also like to congratulate Lauren Klempel for receiving the Outstanding Senior Award for Animal and Range Sciences. The recipient of this award is selected by the undergraduate scholarship committee. It was a tough choice again this year as we had several outstanding undergraduate students.

The faculty continue to publish their research results in peer-reviewed refereed publications. If you see any publication that you would like to receive a copy of or more information about, please let us know. Our faculty also receive recognition by their peers in prestigious awards. As a result of faculty and staff winning these awards, we are able to recruit exceptional faculty, staff and students to our program.

We were fortunate to have Dr. Temple Grandin visit Montana State University during early March. The College of Agriculture and the NSF-INBRE graciously provided funding to bring in Dr. Grandin. I had contacted Temple to invite her to come to Bozeman as a guest during the 2011 Graduation Celebration; however, Temple's calendar is booked up solid for at least a year out. Last summer, I visited with Temple at the National American Association of Animal Science meeting in Denver and she was open during early March. Temple gave two presentations here in Bozeman including an Animal Science talk and an Autism talk. We estimate that we reached out to well over 1,500 people during these presentations.

We were all saddened by the sudden loss of a Dan Scott in late April. Dan's donation to the Animal Bioscience Building is truly appreciated. It will be a lasting tribute to a person that believed in making an impact on people's lives.

Thank you for continuing to support our program and please stop by to see us when you are in Bozeman.

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Awards, Publications & Presentations

New publication: **Frost, R.A.** and **J.C. Mosley**. 2012. [Sulfur Cinquefoil \(*Potentilla recta*\) Response to Defoliation on Foothill Rangeland](#). *Invasive Plant Science and Management*, 5(4):408-416.

New publication: Browsing the Literature by **Jeff Mosley** in the [December 2012](#) issue of the journal *Rangelands*.

New publication: **Frost, R.A., J.C. Mosley** and **B.L. Roeder**. 2013. [Recovery and Viability of Sulfur Cinquefoil Seeds From the Feces of Sheep and Goats](#). *Rangeland Ecology and Management*, 66(1):51-55.

Mike Frisina was invited to give two presentations at the Safari Club International Convention in Reno, NV on January 23-26, 2013. Mike presented "Torghar Conservation Through Sustainable Use" and "Mongolian Argali Investigations."

Mike Frisina and his wife Margaret were awarded the Wild Sheep Foundation Director's Award at the organization's annual convention in Reno, NV. The award was in recognition of *"...outstanding commitment and contributions to the World's wild sheep. Your research and education efforts have fostered development of science-based sustainable-use management programs for wild sheep and other species in many countries."*



New publication: Lensen, A.W., U.M. Sainju and **P.G. Hatfield**. 2013. [Integrating sheep grazing into wheat-fallow systems: Crop yield and soil properties](#). *Field Crops Research* 146 (2013) 75-85.

New publication: Schachtschneider K.M., **C.J. Yeoman**, R.E. Isaacson, B.A. White, L.B. Schook and M. Pieters. 2013. Modulation of systemic immune responses through commensal gastrointestinal microbiota. *PLoS One* 8: e53969

New publication: **Yeoman C.J.**, S.M. Thomas, M.E. Miller, A.V. Ulanov, M. Torralba, S. Lucas, M. Gillis, M. Cregger, A. Gomez, M. Ho, S.R. Leigh, R. Stumpf, D.J. Creedon, M.A. Smith, J.S. Weisbaum, K.E. Nelson, B.A. Wilson and B.A. White. 2013. A multi-omic systems-based approach reveals metabolic markers of bacterial vaginosis and insight into the disease. *PLoS One* 8: e56111.

Ripan Malhi, **Carl J. Yeoman**, Jian Ma, Brian Kemp, Kimberley Tallbear, Jessi Bardill, Noah Rosenberg, and Nanibaa' Garrison were awarded \$99,096 on a recent grant proposal by the National Institutes of Health (NIH) through their R25 Science and Education program. The grant was titled "Guiding Indigenous Students in Next-Generation Genomic Studies with the Summer Internship for Native Americans with an Interest in Genomics (SING). The SING workshop, which began in 2011 brings Native American students from across North America together for a week long workshop on the science, ethics and legalities associated with genomic research. This current funding reflects the success of that program and will keep it running for the next three years.

New publication: **Barsotti, J.L.**, U.M. Sainju, A.W. Lensen, C. Montagne and **P.G. Hatfield**. 2013. [Net Greenhouse Gas Emissions Affected by Sheep Grazing in Dryland Cropping Systems](#). *Soil Sci. Soc. Am. J.* 77:1012-1025.

New publication: Dick, K.J., **G.C. Duff**, S.W. Limesand, S.P. Cuneo, D.K. Knudson, C.P. McMurphy, L.W. Hall, J.C. Bernal-Rigoli, and J.A. Marchello. 2013. Effects of *Lactobacillus acidophilus* and *Propionibacterium freudenreichii* on digestive tract morphology of neo-natal/transition Holstein bull calves and performance by calf-fed Holstein steers. *Prof. Anim. Sci.* 29:107-115.

New publication: **Sharon, K.P., G.C. Duff, J.A. Paterson, J.W. Dailey, J.A. Carroll, and E.A. Maceau**. 2013. Case Study: Effects of timing of a modified-live respiratory viral vaccination on performance, feed intake, antibody titer response, and febrile response of beef heifers. *Prof. Anim. Sci.* 29:307-312.

Special Visitor: Dr. Temple Grandin



Temple Grandin visiting with College of Ag students.

On Tuesday, March 5th, Temple Grandin talked with students and the public about her work in making the treatment of livestock more humane and about autism at the MSU campus. Dr. Grandin was the guest of the Animal & Range Sciences Department and Montana INBRE and COBRE. Funding for Dr. Grandin's visit was generously provided by the College of Agriculture and INBRE/COBRE.

Dr. Grandin appeared in a variety of venues that were free and open to the public. The day began with an open forum from 10 a.m. to noon in the Procrastinator Theatre in the Strand Union Building. During lunch College of Agriculture students had a chance for to visit with Temple in the Animal Bioscience Building. Later in the evening Temple gave two talks – the first focusing on animal science and the second on autism.



Press conference with Temple Grandin in the Animal Bioscience Building.

Due to the high demand for tickets, her appearance was moved from the Museum of the Rockies to the larger Willson Auditorium. The event was a full house!

Dr. Grandin has appeared on television shows such as 20/20, 48 Hours, CNN Larry King Live, Prime-Time Live, 60 Minutes, and the Today Show. She has been featured in People Magazine, the New York Times, Forbes, U.S. News and World Report, Time Magazine, the New York Times book review, and Discover magazine. In 2010, Time Magazine named her one of the 100 most influential people in America. Interviews with Grandin have been broadcast on National Public Radio, and she has a 2010 TED Lecture titled "The World Needs ALL Kinds of Minds." Her life story was made into an HBO movie titled "Temple Grandin," starring Claire Danes which won seven Emmy awards and a Golden Globe.



Temple signing books at the Willson Auditorium.

"I'm a totally visual thinker," Grandin said. She thinks in concrete images and specifics, not vague concepts. "Give me a keyword. I'm like Google. I work just like Google."

Dr. Grandin now teaches courses on livestock behavior and facility design at Colorado State University as well as consulting with the livestock industry on facility design, livestock handling, and animal welfare. She has written more than 400 articles in scientific journals and livestock periodicals. Her books "Animals in Translation" and "Animals Make Us Human" were both on the New York Times bestseller list.

Glenn Duff, Temple Grandin and Donna Duff



Attending Hollywood award shows with Danes "was like a bigger, fancier version of AMI," Grandin said, explaining that stands for "American Meat Institute."

Animal & Range Sciences Spring 2013 Graduating Graduate Students:

Jacob Anderson (Sioux Falls, SD)

Thesis: "The Decline of a Riparian Gallery Forest, Devils Tower, Wyoming: Causation and Management Techniques for Restoration"

Major Professor: Dr. Clayton Marlow

Plans after graduation: Associate partner of Ecological Solutions Group LLC in Stevensville, MT>

Katharine Perz (Sayville, NY)

Thesis: "Effect of Growth Path on Carcass Composition and Meat Quality"

Major Professor: Dr. Jane Ann Boles

Plans after graduation: I am staying at MSU to pursue a Ph.D. with Dr. Jennifer Thomson.

Tucker Porter (Nortonville, KS)

Thesis: "Comparison of Three Remote Sensing Techniques to Measure Biomass on CRP Pastureland"

Major Professor: Dr. Bok Sowell

Plans after graduation: My wife, daughter, and I are moving to Twin Falls, Idaho. I am going to work for the Bureau of Land Management as a Rangeland Management Specialist out of the Burley, Idaho, Field Office.

Jaclyn Rohrs (Bolivar, MO)

Thesis: "Metabolic and Morphometric Effects of Psyllium Supplementation in Horses Grazing Rapidly Growing Cool Season Grasses"

Major Professor: Dr. Shannon Moreaux

Plans after graduation: Getting married on June 8 and hopefully begin working

Molly Runyon (St. James, MO)

Thesis: "Effects of beaver reintroduction and ungulate browsing on aspen recovery in the Eagle Creek drainage on the Northern Yellowstone Winter Range"

Major Professor: Dr. Bok Sowell

Plans after graduation: My plans after graduation are to work for the Forest Service in Montana this summer.

Andrew Schell (Denver, CO)

Professional Paper: "Historic fire management on the Charles Marion Russell Wildlife Refuge, Montana."

Major Professor: Dr. Clayton Marlow

Plans after graduation: Working for the U.S. Fish & Wildlife in Southern Colorado.

Kate Sharon (Dillon, MT)

Thesis: "Effects of On-Arrival, Delayed Vaccination and Supplemental Lysine on Performance, Antibody Titer, Temperature and Metabolic Profiles in Response to Modified-Live Viral Respiratory Vaccination"

Major Professor: Dr. Glenn Duff

Plans after graduation: Summer—Internship with Purina. Fall—Start PhD Program at Texas Tech in Animal Science

Katie Tierney (Atascadero, CA)

Thesis: "Effects of Training on Cattle Grazing Spotted Knapweed and Canada Thistle"

Major Professor: Dr. Bret Olson

Plans after graduation: Interviewing at this time.

CONGRATULATIONS!

Animal & Range Sciences Fall 2012 Bachelor of Science Graduates:

Brian Bignell, Animal Science
 Logan Bird, Natural Resources & Rangeland Ecology
 Caleb Campbell, Animal Science
 Kris Carda, Animal Science
 Erika Hartmann, Natural Resources & Rangeland Ecology

Lyle Peters, Animal Science
 Peter Reinholz, Natural Resources & Rangeland Ecology
 Andrew Sternhagen, Natural Resources & Rangeland Ecology
 Carley Stone, Animal Science

Animal & Range Sciences Prospective Spring and Summer 2013 Bachelor of Science Graduates:

Benjamin Ayre - Animal Science
 Eric Bronson - Animal Science
 Avery Broumas - Animal Science
 Leah Brown - Animal Science
 Reil Buck-Cornelius - Animal Science
 Edward Cope - Natural Resources & Rangeland Ecology
 Shelby Dalke - Animal Science
 Mary Dillon - Animal Science
 Dominic Eickert - Animal Science
 Chris Forseth - Natural Resources & Rangeland Ecology
 Richard Grasser - Natural Resources & Rangeland Ecology
 Jennifer Haugland - Animal Science
 Andrea Hearron - Animal Science
 Eric Hester - Natural Resources & Rangeland Ecology
 Mallory Hines - Animal Science
 Erlise Hogan - Natural Resources & Rangeland Ecology
 Rachel Howard - Natural Resources & Rangeland Ecology
 Mark Hoyt - Animal Science
 Jamie Inglis - Animal Science
 Kate Jacobs - Animal Science
 Rebecca Johnstone - Natural Resources & Rangeland Ecology
 Lauren Klempel - Natural Resources & Rangeland Ecology
 Megan Knaup - Natural Resources & Rangeland Ecology
 Medora Lachman - Animal Science
 Haleigh Lichtenberg - Animal Science and Natural Resources & Rangeland Ecology
 Kellen Marlow - Natural Resources & Rangeland Ecology

Jeremy McKellar - Natural Resources & Rangeland Ecology
 Sadie McMillian - Animal Science
 Anna Luka Mueller - Animal Science
 Jess Patrick - Animal Science
 Meaghan Peterson - Animal Science
 Robbyn Reukauf - Natural Resources & Rangeland Ecology
 Jordan Rice - Natural Resources & Rangeland Ecology
 Devin Roloff - Natural Resources & Rangeland Ecology
 Heather Schoeller - Animal Science
 William Sparks - Animal Science
 Andrew Stickle - Sustainable Food & Bioenergy - Sustainable Livestock Production
 Rachel Thomson - Animal Science
 Kira West - Natural Resources & Rangeland Ecology
 Sarah Wiedenmeyer - Animal Science
 Andrew Williams - Animal Science
 Martina Wilson - Natural Resources & Rangeland Ecology
 Benjamin Worthington - Natural Resources & Rangeland Ecology
 Jesse Young - Natural Resources & Rangeland Ecology
 Weston Zupan - Animal Science

CONGRATULATIONS!

Research Highlight: The Microbiome and Ewe

Under the guidance of Dr. Carl Yeoman, MSU's Animal and Range Science students Jeffery Swartz and Medora Lachman have been busy in a set of concurrent trials generously funded by the Montana Agriculture Experiment Station, EPSCoR, and Land O Lakes. These trials will form the research components for the two students masters degrees.

In October last year, Jeffery Swartz began an exploration of the nutritional, genetic, and microbiological features of the Montana Agricultural Experiment Stations unique Rambouillet sheep lines in relationship to reproductive performance. Thirty ewes from each of the two Rambouillet lines bred for and against lambing rate over the past 45 years, have been followed for intake, blood serum metabolites, and changes in their vaginal microbiota, corresponding to reproductive performance. These factors have been monitored since 1 m prior to breeding and will continue until weaning.

Medora Lachman is currently in the process of collecting gastrointestinal tract samples from the lambs resulting from this breeding exercise to examine how maternal antibodies transferred via colostrum impact the microbial



Medora Lachman is sampling a lamb/ewe pair shortly after the lamb was born.

colonization of the lamb gut and the effect of each animals earliest microbes on immune development and resulting health. Each of these research trials builds on published research findings of Dr. Yeoman and others. For example, the vaginal microbial community can impact the chemical environment of the vagina [Yeoman *et al.*, 2013] with perturbations well documented to impact fertility, dramatically increase the risks of pre-term birth, and mid-late gestational abortion in humans. Further, as the primary source of microbial colonization of neonates, they play important roles in perinatal health. Dr. Yeoman has shown that early microbial colonization is critical to the maturation and modulation of the neonatal immune system with important impacts on an animals response to pathogenic infection [Schachtschneider *et al.*, 2013].



Jeffery will further interrogate this finding over the summer to determine if there are variations in how intake relates to the animals overall nutrition. By examining blood sera metabolites and animal body condition along with examining the effects that genetics and vaginal microbiota have on the reproductive performance of the ewes.



Jeffery Swartz and Dr. Jim Berardinelli ultra sounding a ewe.



Upcoming Dates

May 4, 2013	MSU Commencement
May 13, 2013	Classes Begin (Summer Semester)
May 27, 2013	Memorial Day Holiday (no classes, MSU offices closed)
June 19, 2013	WERA-39-WSASAS Sheep Symposium (Bozeman) Sheep Symposium
June 19-21, 2013	American Society of Animal Science Western Section Meeting (MSU—Bozeman)
July 4, 2013	Independence Day Holiday (no classes, MSU offices closed)
August 2, 2013	Classes End
August 26, 2013	Classes Begin (Falls Semester)
September 2, 2013	Labor Day Holiday (no classes, MSU offices closed)

Where Has Glenn Been?

January 2013:
Peterson Ranch with Calving Class (Judith Gap)

February 2013:
National Cattlemen's Beef Association Convention (NCBA) (Tampa, FL)
LEAD 21 (Washington DC)

May 2013:
Beef Sustainability Workshop (Billings, MT)



Recent Events Held in the Animal Bioscience Building



February 11, 2013 Stillwater Range Assoc. Annual Meeting
February 20, 2013 Extension New Agent Orientation
February 20-21, 2013 Montana Wheat & Barley Symposium
March 4, 2013 Montana Grains Foundation Meeting
March 8, 2013 Montana Feed Assoc. Scholarship Interviews
April 6, 2013 American Writing Instructors of America Workshop
April 6, 2013 Expanding Your Horizons Workshop
April 26, 2013 Bair Foundation Committee Annual Meeting
May 1, 2013 Leadership Bozeman Ag Day
May 6-9, 2013 HACCP Training

Extension Highlight: MSU Extension and MAES Collaborators Win Awards for Mortality Composting Project

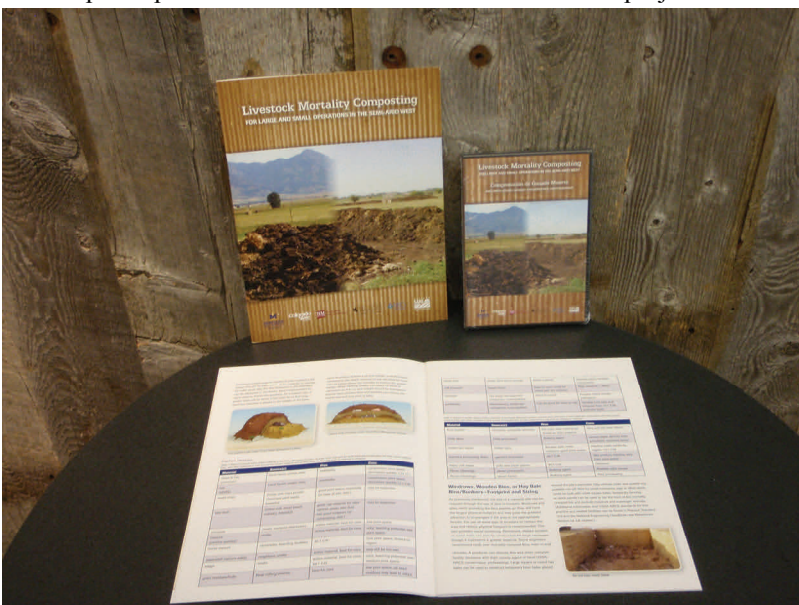
Darrin Boss, Julia Dafoe, Tommy Bass, and their multi-state collaborators were honored this past winter for their efforts and productivity on a three-year Livestock Mortality Composting Demonstration and Education Project. The American Society of Agronomy conferred a Certificate of Excellence in recognition of “outstanding educational materials” and Colorado State University Extension presented the multi-state Mortality Management Team with its 2012 Extension Team Award.

Proper management of animal mortality on livestock operations has important implications in nutrient management, herd and flock health, as well as farm, family and public health. For this reason it is imperative to be familiar with best management practices for dealing with dead animals. It is also important to understand that most states have laws related to proper disposal or processing of mortalities.

The purpose of proper mortality disposal is to prevent the spread of infectious, contagious and communicable diseases and to protect air, water and soil quality. Also, there are legal issues and requirements related to nutrient management and the permitting of animal feeding operations. In the nutrient management plan for permitted animal feeding operations, disposal of routine operational mortalities and catastrophic mortalities must be defined.

Mortality Composting is an often preferable practice to other methods of large carcass disposal. Composting large carcasses can save labor and land. This practice allows a dedicated area to be used and reused for carcass management; it is done above ground, thereby reducing the number of labor-intensive burial pits created as well as minimizing the number of buried carcasses on the property. Many livestock operations across the United States and Canada have demonstrated success in managing operational and catastrophic mortalities by composting. However, there is still value in discussing this practice in order to assist more producers in adopting it, and in sharing information to improve success where mortality composting is already in use.

To this end, Montana State University Extension and the Montana Agricultural Experiment Station – Northern Ag Research Center participated in a four-state Western SARE funded project to validate recommendations, and to produce tools that assist



agricultural advisors and producers in adopting large carcass composting. This was also part of ongoing compost research and demonstration at MAES-NARC. Led by Colorado State University, the mortality project also included the University of Wyoming, and New Mexico State University, in addition to MSU. MSU took the lead on publishing a manual and companion PowerPoint. CSU developed a companion video and decision making tool.

The materials can be found at the following sites:
 Manual: <http://www.msuextension.org/store/>, SKU EB0205, title: Livestock Mortality Composting for Large and Small Operations in the Semi-Arid West. All other resources can be found at: <http://livestockandenvironment.org/projects-2/projects/>. Limited print copies are available through MSU Extension Publications. Contact Tommy Bass (tmbass@montana.edu) for further details.

Other News



The 2013 Montana Nutrition Conference and Livestock Forum was held in Bozeman on April 9-10. The conference is a joint effort between the Animal and Range Sciences Department and the Montana Feed Association. Rachel Endecott organized the conference with the help of a planning committee made up of Montana Feed Association representatives. This year's theme was "Ranching Resilience" and over 160 attendees learned from national, regional, and local speakers about topics ranging from cattle industry economics to drought impact on groundwater to increasing flexibility of a ranch enterprise. Jude Capper was this year's Grieco Beef Cattle Lecture Series speaker with the topic of "How Do We Maintain US Beef Production Sustainability and Resilience Moving Toward 2050?". The planning committee would like to thank Dr. Paul Grieco for his continued support of the lectureship series. Winners of the annual graduate student poster competition were Jaelyn Rohrs (1st place), Kate Sharon (2nd place), and Jeff Swartz (3rd place). Graduate student posters and speaker slides can be viewed at www.msuextension.org/beefcattle, click on "Resources".

Raul Lira, Agricultural Engineer at the Regional Research Center Kampenaike, and seven other producers from Southern Chile visited Rodney Kott at the Wool Lab on April 18, 2013. Previously, in August of 2009, Rodney had spoken to a large group of sheep producers in Southern Chile at Raul's request. Because of this connection, Raul traveled to Montana to learn more about increasing reproductive rates in sheep in a range operation. Rodney spoke to them about MSU's genetics and breeding program, answering many questions from the group. Other topics included wool research and the wool industry in the U.S., the application of technology in the industry, and potential research that might be conducted in Chile. Raul acted as translator for the non-English speaking group.



Remembering Dan Scott

A true friend and supporter of the Animal & Range Sciences Department, Dan Scott, passed away on Saturday, April 27th doing something he really loved – flying his helicopter over the land that he cared for.

Dan believed in making an impact on his communities and other people's lives. Only two of many examples of his generosity are his support of the Tongue River Valley Community Center (TRVCC) in Dayton and Ranchester, Wyoming, where he raised his family, and his **donations to Montana State University's physiology lab in the College of Agriculture's new Animal Bioscience Building**. Both of these projects were important to him as he looked ahead to the future, both for his community and his agriculture constituents.



Research in the Scott Family Physiology Laboratory focuses on generating and understanding new concepts and mechanisms involved with physiological bases of functional genomics, proteomics and metabolomics that influence breeding quality, growth and reproduction, primarily in sheep and cattle.

September 12, 2010 Scott Family members officially christened the "Scott Family Physiology Laboratory" in the new Animal Bioscience Building.

Student News



The MSU Academic Quadrathlon contest was held February 21-23. Four-member teams competed in a four-part animal science contest to win a place in the Western Regional Academic Quadrathlon. The contest consists of a written exam, oral presentation, hands-on lab practicum, and a double elimination quiz bowl. The first place team of (L to R) Katy Klick, Russell Quinlan, Kenneth Gas-kill and Lane Schmitt will be representing MSU in the regional contest, which will actually be hosted by MSU on June 17-18 in conjunction with the Western Section American Society of Animal Science meetings. Rachel Endecott advises the Academic Quadrathlon team.

Karoline Rose, Animal & Range Sciences undergraduate student was awarded two scholarships recently:

Karoline Rose was the third place winner of the College Aggies Online program. With nearly 1,000 members, representing nearly 100 universities across the country, Karoline was recognized for her efforts on the College Aggies Online network. The Animal Agriculture Alliance presented Karoline with a scholarship for her third place prize.



The Montana Feed Association awarded scholarships to Karoline Rose of Three Forks and Ben Johnson of Sidney at the 2013 Montana Nutrition Conference and Livestock Forum that was held in Bozeman on April 9-10. The conference is a joint effort between the Animal and Range Sciences Department and the Montana Feed Association.



The MSU Collegiate Wool Judging Team at the National Western Stock Show in Denver, CO. Pictured is Dr. Lisa Surber, Karoline Rose (3rd high individual for Reasons), Kendall Green, Andrew Raftopoulos and Evan Helle.

Help Support Animal and Range Sciences

A gift to the department is a great way to support student and faculty endeavors. Donations can be earmarked for student scholarship funds, faculty research, the new Animal Bioscience Building, and more.

For more information about making a donation to the department contact:

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Animal Bioscience Building

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