



IDAHO RANGE LIVESTOCK SYMPOSIUM

JANUARY 12, 2021

9:30 AM TO 3:30 PM MST

University of Idaho Extension



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- 9:30 am **Welcome**
- 9:35 am **Dennis Metzger, Superior Livestock Auction**
Adding Value to Your Cattle Through Superior Livestock Data
- 10:15 am **Ben Eborn, University of Idaho Extension**
Agricultural Economist, Professor
Comparing the Profitability of Four Ranch Management Systems
- 11:00 am **Break**
- 11:15 am **Dr. John Hall, Ext Beef Specialist & Superintendent UI Nancy M. Cummings REEC**
Comparison of Range-Based and Irrigated Cow/Calf Systems
- Noon **Lunch**
- 12:30 pm **Kenneth Randall, Graduate Student University of Idaho**
Riparian Grazing Management Strategies in Sage-grouse Habitat
- 1:15 pm **Thadd Strom, Idaho State Dept. of Ag and Chris Black, Idaho Rancher**
Rangeland Photo Monitoring
- 1:45 pm **Dr. Derek Bailey, Professor New Mexico State University**
Potential to Use Genetic Selection to Manipulate Terrain Use of Beef Cattle
- 2:30 pm **Dr. Matthew Garcia, Beef Specialist, Utah State University**
Using Modern Technologies and Genetic Testing in Beef Cattle Selection
- 3:15 pm **Wrap-up and Adjourn**

ADDING VALUE TO YOUR CATTLE THROUGH SUPERIOR LIVESTOCK DATA

Dennis Metzger, Superior Livestock Auction



Dennis Metzger has a strong seedstock background and has incorporated that knowledge and experience with the feeder cattle sector. This work has given Dennis a very strong knowledge base of genetics and how to incorporate genetic selection into cattle operations to help add potential value. He is also a livestock representative for Superior Livestock and has twenty years of experience in feeder cattle procurement. His primary focus is on assisting ranches with moving towards aggressive and progressive commercial cattle operations throughout fifteen states. He promotes the use of value-added genetics to improve cattle operations. He has been a part of “Superior Sunrise,” which is an educational program that allows viewers to learn more about Superior Livestock and the cattle market. Superior Sunrise also provides current information regarding the livestock industry.

ADDING VALUE TO YOUR CATTLE THROUGH SUPERIOR LIVESTOCK DATA

In 1987, Superior Livestock introduced satellite video marketing to the nation's livestock industry and forever changed the way load-lots of cattle are marketed. Now, Superior is the largest cattle marketing network in North America; marketing 1.38 million head of cattle in 2019. Superior is well respected as a leader in industry innovation and the use of state-of-the-art technologies. With over 400 representatives across the United States, Superior provides a full-service, national positioned cattle marketing solution that serves both buyers and sellers.

I have seen several commercial and seedstock operations do all the right practices in regard to production of healthy, wholesome beef. These practices include genetic selection, vaccination, and feeding programs. However, marketing of an operation's valuable cattle is often overlooked and may be intimidating to many ranchers. For this reason, my primary focus has been to help operations increase their efforts in marketing their cattle and production programs. The right, aggressive marketing techniques can lead to additional cattle value. It is incredibly rewarding to help cattle operations increase the value of their product.

Value can be added to your cattle to increase ranch profits through these four categories: 1) animal health/vaccination programs and protocols; 2) the use of superior progressive genetics; 3) third party verification programs; and 4) marketing. The incorporation of these strategies on your ranch can add value to your cattle and increase profits for your operation. These four categories will be discussed in detail during the online presentation.



COMPARING THE PROFITABILITY OF FOUR RANCH MANAGEMENT SYSTEMS



*Ben Eborn, University of Idaho
Extension Agricultural Economist, Professor*

Ben Eborn is an Area Extension Ag Economist whose programming focuses on farm and ranch management, production economics, and farm succession. He has a master's degree in Ag Economics from the University of Idaho. Ben lives in Paris, Idaho with his wife and seven kids. They enjoy working together on their cow-calf operation.

COMPARING THE PROFITABILITY OF FOUR RANCH MANAGEMENT SYSTEMS

1. Typical cow-calf operation
2. Use terminal sires – purchase all replacements
3. Minimize cow depreciation – sell cows as 6-year-olds
4. Sell the cows and run yearling stockers

Idaho AgBiz: Enterprise budget templates for cow-calf, replacement heifers, and stocker cattle:

<https://www.uidaho.edu/cals/idaho-agbiz/livestock-budgets>



Livestock Budgets | Idaho AgBiz | University of Idaho

University of Idaho Extension provides spreadsheets and other resources to assist with...

 [uidaho.edu](https://www.uidaho.edu)

COMPARISON OF RANGE-BASED AND IRRIGATED COW/CALF SYSTEMS

*Dr. John Hall, Extension Beef Specialist and Superintendent
University of Idaho Nancy M. Cummings REEC*



John Hall is Professor and Extension Beef Cattle Specialist located at the University of Idaho Nancy M. Cummings Research, Extension, and Education Center where he also serves as the station Superintendent.

He has been with the University of Idaho for 12 years. Prior to coming to Idaho, Dr. Hall worked at Fort Keogh Livestock and Range Research Laboratory, and was on faculty at the University of Minnesota and Virginia Tech. His current role is to conduct research and extension programs on beef reproduction and beef cow-calf systems. His particular interests are estrus synchronization systems, use of gender selected semen, nutrition reproduction interactions, and utilization of forages. John is a seventh-generation agriculturalist, and he and his wife, Beverly, have two sons.

COMPARISON OF RANGE-BASED AND IRRIGATED COW/CALF SYSTEMS

J.B. Hall, J. Sprinkle, M. Ellison, S. Goddard, B. Murdoch, J.B Glaze, P. Bass, M. Colle and K. Lee

In 2016, the University of Idaho was able to access the Rock Creek Ranch with the assistance and support of the Idaho beef industry, conservation groups and legislative friends. This added a much-needed range research component. The ranch was acquired in 2019 and the name changed to UI Rinker Rock Creek Ranch (RRCR).

Since 2016, a beef systems comparison project has been conducted to examine differences and opportunities for improvement in range-based or irrigated cow-calf systems. Cows from the UI Nancy M. Cummings REEC (NMCREEC) cow herd were stratified by age, weight and productivity and assigned to either range-based (RAN) or irrigated systems (IRR). Cows from both groups are managed at NMCREEC from December to April. Cows are nutritionally managed to calve in body condition score (BCS) 5. Cows in both systems are bred by artificial insemination to the same bulls before being turned out to pasture or range. Natural service bulls stay with cows for 60-day breeding season. IRR cows graze irrigated pasture, hay aftermath and fall crops from May to mid-December. RAN cows graze range at RRCR from May to October and then move to the US Sheep Experiment Station in Dubois to graze range until early December. Calves are born in February and March. They are weaned in September. All calves return to NMCREEC in October for backgrounding during the fall. Steers are backgrounded for 60 days before going to the feedlot. Carcass data is returned on the steers. Heifers are backgrounded for 100 day before going to feed efficiency testing. Results are based on 5-year average. At calving cows are similar in weight and BCS. However, by weaning RAN cows are lighter ($P < 0.002$) and carry less body condition. These differences are still evident at the end of the grazing season in December. At weaning, steer calves from the IRR system are 50 lbs lighter than IRR steers and RAN heifers are 42 lbs lighter ($P < 0.003$). However, RAN calves exhibit compensatory gain during the backgrounding period. Carcass data lags behind growth data by a year. Four years of carcass data indicates that RAN and IRR calves may have similar carcass quality, but RAN calves may have slightly increased percentages of carcasses that grade Select but also Prime. Information on long-term effects of each system on replacement heifer performance is just becoming apparent. RAN heifer are lighter, less efficient and may not breed as early in the breeding season as IRR heifers. In the RAN system, there are opportunities to capture value through backgrounding and perhaps early weaning. In contrast, the IRR system may be able to lower winter feed costs whereas greater cow size is a challenge.

RIPARIAN GRAZING MANAGEMENT STRATEGIES IN SAGE- GROUSE HABITAT

Kenneth Randall, University of Idaho



Kenny graduated from the University of Idaho in 2018 with a bachelor's degree in Fishery Resources. During his undergraduate degree, he worked as a rangeland technician for the University of Idaho and as a wildlife biologist student trainee for the Bureau of Land Management. This work sparked his interest in the interactions between livestock grazing and sage-grouse. Kenny is now a master's student at the University of Idaho and his thesis research is focused on evaluating how changes in the timing and intensity of grazing influence plant communities preferred by sage-grouse, soil moisture retention, and growth of yearling cattle.

RIPARIAN GRAZING MANAGEMENT STRATEGIES IN SAGE-GROUSE HABITAT

In arid rangelands, wet meadows provide water and forage used by wildlife and livestock. Because wet meadows account for a small proportion of the overall landscape, balancing the management of these resources for multiple users is essential. In Idaho, greater sage-grouse (*Centrocercus urophasianus*), a species of greatest conservation need, rely on specific species of flowering plants (hereafter preferred forbs) during brood-rearing that occur in wet meadows. Our study evaluates how differences in the timing and intensity of livestock grazing influences sage-grouse preferred forbs and livestock performance in wet meadows used by sage-grouse. We established 15 pastures in wet meadows at Rinker Rock Creek Ranch in south-central Idaho. Pastures were stocked with yearling heifers during 2019 and 2020. During June (early-season) and August (late-season), heifers grazed pastures at moderate (30-40%) and high (70-80%) relative utilization levels for 16 days. Three pastures provided un-grazed controls. To compare short-duration grazing with season-long continuous grazing practiced within this region, three wet meadow pastures received continuous grazing treatments to achieve an overall utilization of 60%. Measurements of plant communities and heifer performance occurred before and after grazing. Cover of preferred forbs was low in many pastures but ranged from $0.83 \pm 0.33\%$ in control pastures to $28.31 \pm 15.76\%$ in continuous grazing pastures. Average daily gains of heifers in short-duration trials varied from $0.68 \pm 0.15\text{kg}$ per day in high-intensity grazing during the late-season to $1.05 \pm 0.15\text{kg}$ per day in moderate-intensity grazing during the early-season. Results will grant insight into how grazing may be used to maintain or enhance wet meadow habitats shared by sage-grouse and livestock, and potential management strategies will be discussed.

Photographs of Pasture Condition on August 17th, 2019

Early Season		Late Season		Entire Season	
Moderate Intensity	High Intensity	Moderate Intensity	High Intensity	Continuous	Control
					

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Thadd Strom, ISDA

My name is Thadd Strom and I am the Range Program Manager with Idaho State Department of Agriculture (ISDA) in Boise. I have worked at ISDA for three years now, previously working out of the Twin Falls office. I graduated from Colorado State University, studying Natural Resource Management, Rangeland Ecology and GIS. During my time with ISDA, I have worked collaboratively with the Bureau of Land Management (BLM), United States Forest Service (USFS), livestock producers, the public concerning Rangeland Monitoring, NEPA processes and decisions. I along with my coworkers, received the 2019 Idaho Section-Society of Range Management “Top Hand Award” for development and implementation of the field photo monitoring application.



Chris Black, Professional Rancher

My family moved to the Bruneau area in 1875, that makes me 5th generation Rancher. I attended a Holistic Management training, applied the ideas learned to my situation to develop flexible management plans for my allotments and private lands. I learned the importance of Monitoring to both prove my success and provide a direction for future management. I’ve been honored with many awards and positions. In the end, I am just a Rancher living on the land and making my living on the land. In today's society I have to wear many hats, just to do what I Love.

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RANGELAND PHOTO MONITORING

Who is ISDA Range Program?

Idaho State Department of Agriculture (ISDA) - Range Program provides support, coordination, and technical expertise to private and government rangeland managers and users.

Thadd Strom, Range Program Manager, Boise ISDA Office
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Jeremiah Johnson, Range Management Specialist, Eastern Idaho Region
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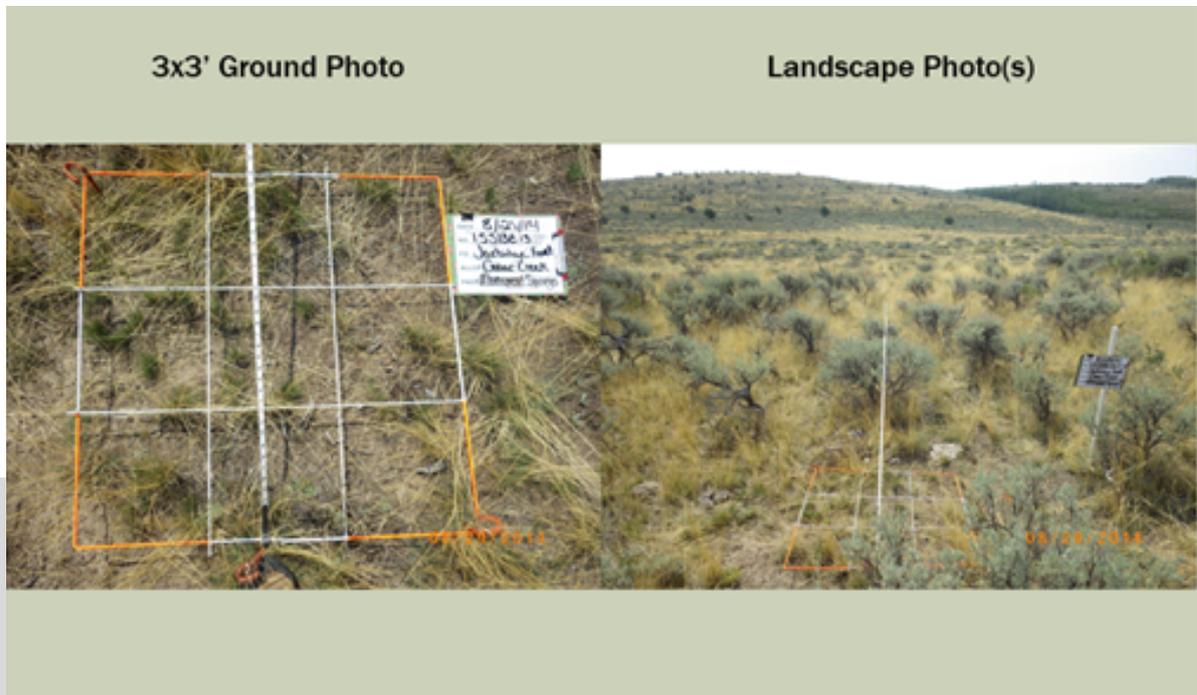
Addison Wood, Range Management Specialist, Western Idaho Region
(208) 332-8566, addison.woods@isda.idaho.gov

What is Cooperative Photo Monitoring?

Photo Monitoring is monitoring that ranchers can readily perform on an annual basis. Photos can show positive measurable and observable changes in vegetation, which is the definition of significant progress in the Bureau of Land Management (BLM) Idaho Standards and Guidelines for Rangeland Health. The ISDA/BLM Cooperative Photo Monitoring program is a golden opportunity for BLM grazing permittees to engage with the monitoring and assessment of their grazing allotment(s) and the permit renewal process. This program provides specialized training in scientifically valid monitoring procedures.

In 2014, the ISDA and BLM entered into a Memorandum of Understanding (MOU) for photo monitoring on public lands administered by the BLM. This MOU set in place a framework for ISDA to aid permittees in collecting photo point data on allotments for use in future BLM land health assessments and analysis for grazing permit renewals. The ISDA and BLM collaborate with and assist ranchers in performing monitoring using the methods identified in the MOU. ISDA, BLM, and ranchers coordinate to obtain copies of photo data currently existing in an allotment and determine if these monitoring sites are adequate or if additional sites need to be established. The ISDA provides training to permittees according to the MOU protocol during the first year a rancher participates in the program, and then ranchers or their representatives conduct annual repeat photography. Photos are submitted to BLM and ISDA to be verified and used as monitoring data in the grazing permit renewal process. Continuous years of photo monitoring data that is collected consistent with BLM policy helps fill data gaps and “tell a story” about how an allotment is responding to management and other factors over time. ISDA believes that with the strong collaborative approach that this photo monitoring program provides, land management agencies will be better equipped to make well-informed decisions that are supported with good, current monitoring data, all while facilitating the exchange of producer information and knowledge regarding the management of their individual allotment during permit renewal.

RANGELAND PHOTO MONITORING



The App

It is a priority of the ISDA Range Program to advocate the use of the most current monitoring procedures and tools. We are excited to offer the use of a mobile app to optimize the ISDA/BLM cooperative photo monitoring program.

The Survey123 app for ArcGIS is a simple and user-friendly tool that aids in streamlining data collection and analysis.

It is as simple as downloading the free app, accessing the ISDA monitoring form, collecting your data, and hitting submit.

No paper forms or emailing pictures necessary. Just complete the form in the app and it will do the rest!



RANGELAND PHOTO MONITORING

Chris Black, Idaho Rancher

In order to know where you're going in the future you have to know where you are now and where you've been in the past. That's what monitoring does for us, it gives us that yardstick that we can measure success and failure to, so we can re-plan for future success. It is something that clarifies reality and makes it tangible not anecdotally.

Monitoring works as a teacher about the land. I've never learned so much about the land as when I'm running transects. It forces you to look at one tiny patch of ground so you can record the characteristics but then each time I do I look up and I look around and I see how that little patch of ground fits into the big picture. That is a lesson in life.

How little things, soil, plants insects & animals, come together to make a Holistic picture. Yes monitoring can be used to make decisions and sometimes more importantly keep others from making decisions for you with limited information.

Photo monitoring is monitoring in the easiest form. A photo with a description, a place, a date, can be easily understood by others. This understanding increases as the photos are replicated as the years pass. This is real science for after all science is only just a set of verifiable observations. This catalog of powerful information to help with management decisions can be had quite easily with the tools most of us carry on our pockets now. With or without service almost all cell phones have cameras, GPS units, and lots of apps that do a wonderful job of gathering monitoring information if used appropriately.

Monitoring can help you make decisions on moving forward in your management of the ranch. It can help keep the wolves at bay, so to speak, but bring better understanding to everyone. With smartphones and apps it can be easier to execute. For all the reasons above it can allow us to do what we love to do, that is Ranch on the land with our families!



POTENTIAL TO USE GENETIC SELECTION TO MANIPULATE TERRAIN USE OF BEEF CATTLE

Dr. Derek Bailey

Professor New Mexico State University



Derek Bailey is a Professor of Range Science at New Mexico State University in Las Cruces, New Mexico USA. After growing up on a cattle ranch in southern Colorado, Derek received his PhD in Range Science and his MS and BS degrees in Animal Science at Colorado State University. Before to coming to NMSU, Derek worked as a researcher for Montana State University and USDA-ARS in Oklahoma. He also was a range management consultant in Nevada and an extension agent in Arizona. His research interests include precision livestock management, rangeland cattle and sheep production, grazing management and animal welfare. In addition, he teaches courses in rangeland management, research methods, livestock handling and vegetation monitoring.

POTENTIAL TO USE GENETIC SELECTION TO MANIPULATE TERRAIN USE OF BEEF CATTLE

Cattle grazing distribution is a critical issue for ranchers in the western US. We conducted two studies with the objective to identify and validate genetic markers that were associated with terrain use of beef cows grazing mountainous and extensive rangeland pastures. Genetic markers that are associated with phenotypic traits are often referred to as quantitative trait loci (QTL). The presence of QTL for terrain use would indicate that grazing distribution is inherited and genetic selection could be effective.

Cattle were tracked at 14 ranches located in New Mexico, Arizona, Colorado, Nevada and Wyoming. At each ranch, 8 to 35 cows were tracked with global positioning system (GPS) collars at 10 or 15-minute intervals for periods of 3 to 19 weeks. Cow breeds varied across ranches but the majority were Angus or Angus crosses. Cows were tracked throughout the year, and at some ranches, cows were lactating and had calves and other ranches cows were dry. Blood samples were obtained for all tracked cows to use for DNA analyses. Most of the cows (89%) were genotyped using the Illumina Bovine HD SNP array, which evaluates approximately 770,000 genetic markers (i.e., single nucleotide polymorphisms SNPs) across the 30 bovine chromosomes. The remaining cows were genotyped using the BovineSNP50 Beadchip (53,714 SNP). In total, 330 cows were tracked, genotyped and used in the analyses.

In our first study, genetic markers associated with terrain use were identified with single SNP regression, which may result in more false positives than BayesC methodology. The BayesC methodology was not available at the time of our previous study. In our latest study, a genome-wide association study was conducted using BayesC methodology which is the software now used by most breed associations for genetic evaluation.

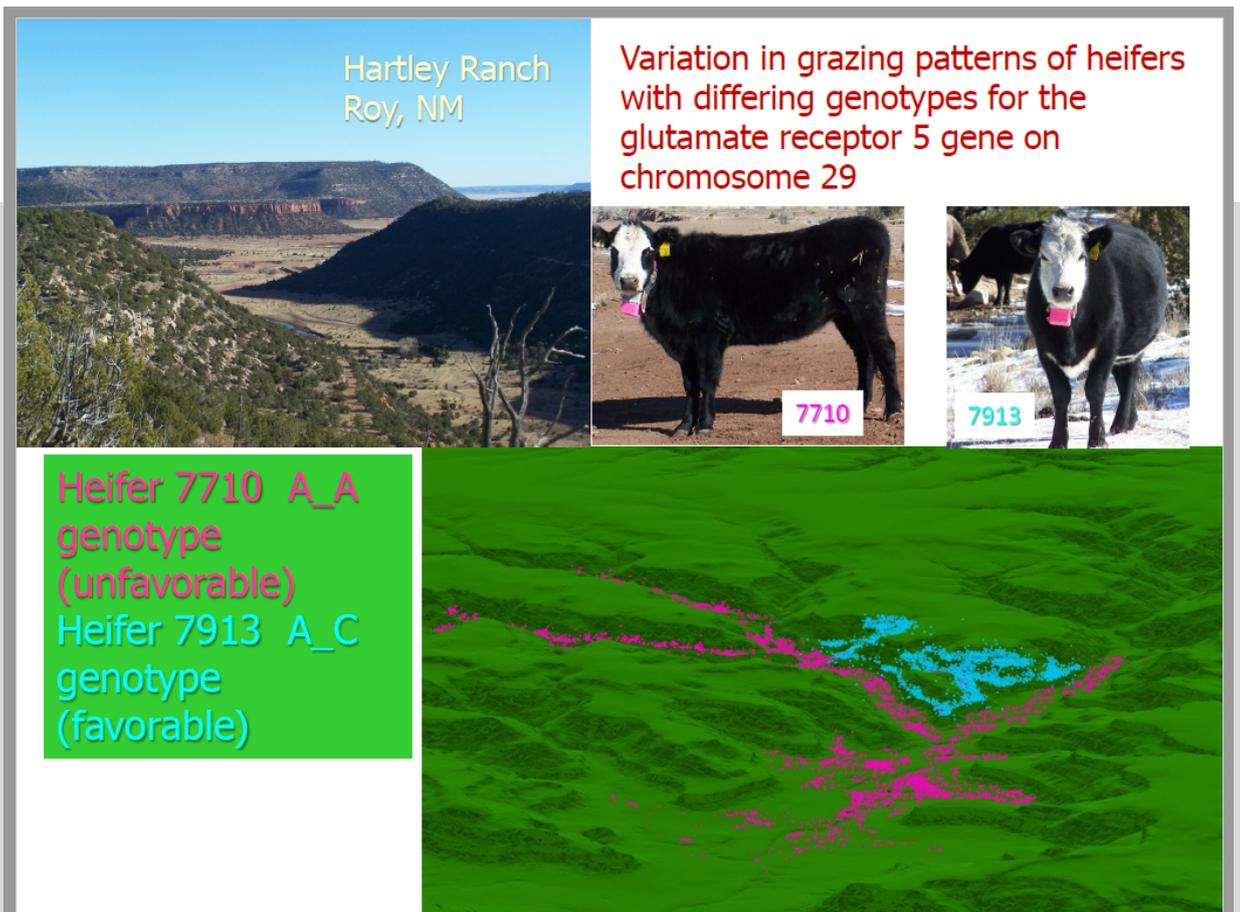
In the first study, five genetic markers (SNP) accounted for 36% of the variation in a terrain use index of slope and elevation use. In the second study, a total of 29 putative candidate genes were identified for terrain use in beef cattle. The association of genetic markers with the use of steep slopes, high elevation and areas far from water shows that terrain use can be inherited. The large number of candidate genes demonstrates the polygenic nature of terrain use traits. The functional annotation analysis showed that these candidate genes were related to a variety of biological processes including hypoxia, feed efficiency and weight gain.

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POTENTIAL TO USE GENETIC SELECTION TO MANIPULATE TERRAIN USE OF BEEF CATTLE

Although these findings are exciting, the association of the genetic markers and terrain use in these studies was not yet sufficient to develop a commercially viable genomic breeding value for terrain use. However, our results demonstrate the potential to develop a breeding value that ranchers could use to rank bulls and replacement heifers for their potential to produce daughters that are willing to use rugged terrain and travel further from water. Detection of genotype to phenotype associations in the latest study was likely limited by the moderate sample size and heterogeneity in some of our data points which is inherent in large scale field studies. Terrain, vegetation, breeds and management varied across the 14 ranches used in the study. Therefore, a large independent population of beef cows, composed of one breed, grazing on the same pastures is needed to refine terrain-use measurements and further elucidate the role of genetics in cattle grazing distribution on rugged rangeland.

With additional research and development, ranchers may be able to identify bulls and replacement heifers that have desirable breeding values for terrain use using only DNA samples from hair or blood. In addition, the cost of GPS tracking is dropping due to technological advancements. Currently, ranchers may be able to identify cows that use steeper terrain and areas far from water using GPS tracking and visual observations. Although more research is needed, selecting for such “hill climbing” cows may improve use of rugged rangeland and reduce grazing impacts on riparian areas.



USING MODERN TECHNOLOGIES AND GENETIC TESTING IN BEEF CATTLE SELECTION

*Dr. Matthew Garcia, Beef Specialist
Utah State University*



I born and raised on a cow-calf operation in central New Mexico (Torreon, NM) and pursued a bachelors and master's degrees in animal science from New Mexico State University. Upon completion of my M.S. degree with a major focus on animal breeding and genetics, I left New Mexico to pursue my PhD in beef cattle genomics from Washington State University. After completion of my PhD I did two post-doctoral research fellowships, one in a cytogenetics laboratory, and a second that was two-year stint at USDA Meat Animal Research Center in Clay Center NE with a focus on SNP association studies related to animal disease and carcass traits. During this time I also completed an MBA to more completely round out my academic and professional training. Prior to coming to Utah State University, I was a faculty member at Louisiana State University for seven years. I had a research/teaching program that focused on beef cattle genomics, but I also managed the beef herds (~500 purebred and commercial crossbred cattle) for LSU at the Central Research Station. I have been part of the USU-ADVS faculty at Utah State University since July 1, 2016 as the Beef Specialist focusing on whole system production considerations and complementary selection practices for the intermountain beef production system.

USING MODERN TECHNOLOGIES AND GENETIC TESTING IN BEEF CATTLE SELECTION

Matthew D Garcia, Kim Chapman, Kevin Heaton, Josh Dallin, Kerry A. Rood, Jacob Hadfield and Ryan Larsen. Utah State University, Logan UT

The objective of this study was to utilize GPS technology and commercially available genomic tests to provide a more accurate measurement of bull power and increase accuracy of selection for heifers in intermountain west beef production systems. Breeding seasons in the intermountain west are typically conducted on large, remote pastures, leading to current estimates of bull:cow ratios (1:20 or 1:25) possibly being inaccurate. Traditionally, producers established bull:cow ratios from experience and select heifers after weaning based on performance and size. With advances in genetic testing, parentage of calves can be obtained allowing producers to review which calves were sired from specific bulls, or how many cows each bull serviced (bull power) and potentially which heifers have the genetic predisposition to succeed in a production system. Our first study fitted 5 bulls from the same herd with GPS collars and collected hair samples for future DNA extraction prior to the 2018 breeding season. Bull movement was tracked over a 90-day breeding season on a large grazing allotment in southern Utah and northern Arizona that was fenced separate from other grazing herds. The GPS collars collected measurements of total distance traveled per day and distance traveled away from water, along with geocoordinates. Upon completion of the breeding season, collars were removed and data retrieved. At calving, a total of 104 calves were identified by ownership as potential offspring of the collared bulls and had ear notches collected for DNA extraction and parentage analyses. Results of parentage testing revealed that actually 6 bulls sired calves during the 2018 breeding season. The ranch's bulls sired 72 (69%) calves (30, 16, 14, 10 and 2 calves, respectively). Thirty-two (31%) calves were sired by bulls from herds that grazed nearby. Interesting to note is the producer was unaware of any non-herd bulls co-mingling with this herd.

Our second study evaluated cows greater than 9 years of age that had never missed a calf and always raised a calf to weaning. These cows were tested with the Igenity beef panel and evaluated against the heifer selection index to evaluate their index scores with a modern genomic test. Unfortunately, 75% of these productive cows would have been culled if the genomic index was used as the sole method of selection. While results from the current study are very preliminary, they do validate the importance of verifying bull power and sire identification to critically evaluate sire performance and increase the accuracy of selection in breeding replacements. Furthermore, the results of the study indicate that a critical evaluation of commercially available genomic tests to select breeding replacements may be more complex than originally thought. The preliminary information presented herein may prove useful as a future selection tool to identify bulls that are high performing during breeding season in the intermountain west.

SPONSORS

This symposium would not be possible without our sponsors. Although the 2021 program is virtual, we appreciate your continued support for the Idaho Range Livestock Symposium over past years!



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IF YOU HAVE QUESTIONS OR COMMENTS, PLEASE CONTACT:

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SYMPOSIUM PARTNERS AND PLANNING COMMITTEE

Partners: University of Idaho Extension, College of Agricultural and Life Sciences, College of Natural Resources, and Rangeland Center; Idaho State Department of Agriculture, Idaho Rangeland Resources Commission, Idaho Department of Lands, Idaho Cattle Association, and the Natural Resources Conservation Service.

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