



2024 ANNUAL REPORT

CORONA RANGE AND LIVESTOCK RESEARCH CENTER

THE NMSU AGRICULTURAL EXPERIMENT
STATION SUPPORTS RESEARCH THAT
ADDRESSES REAL-WORLD PROBLEMS.
RESEARCH IS AT THE CORE OF NMSU'S
MISSION TO IMPROVE THE LIVES OF
PEOPLE GLOBALLY.

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**College of Agricultural, Consumer
and Environmental Sciences**
Agricultural Experiment Station

Corona Range and Livestock Research Center



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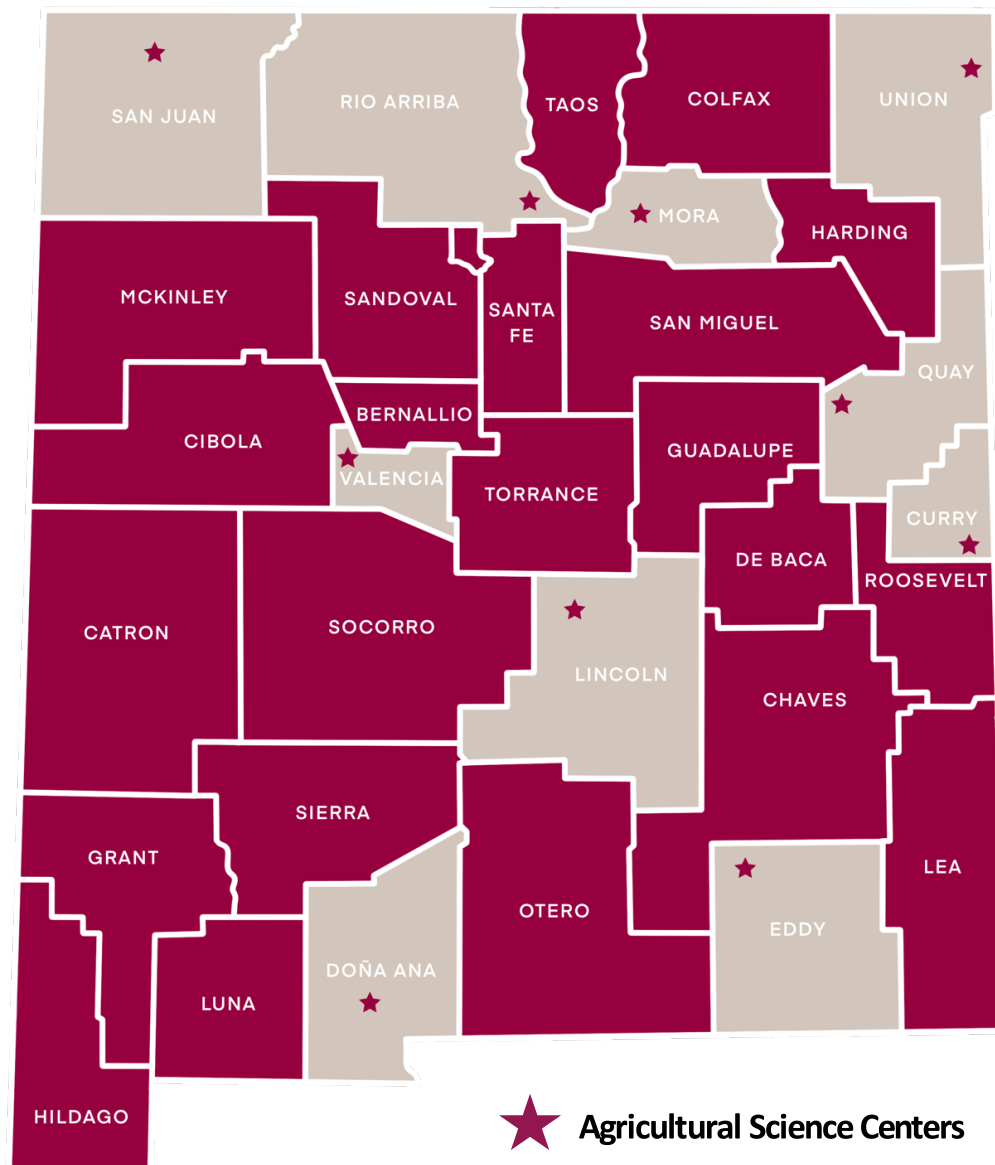
Notice to Users of this Report

These are not formal Agricultural Experiment Station Report research results. The reader is cautioned against drawing conclusions or making recommendations as a result of the summaries in this report. In many instances, data represents only one of several years' results that will ultimately constitute the final formal report.

None of the data are authorized for release or publication without the written prior approval of the New Mexico Agricultural Experiment Station.

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Agricultural Science Center Locations Map



Executive Summary

The Corona Range and Livestock Research Center increased the implementation of precision agriculture technology in livestock research. The research center obtained two solar-powered pasture feeding systems. This has allowed researchers greater flexibility and statistical power in research. Specifically, this equipment is designed to identify individual animals as they enter the feeding system and will provide specific supplements and amounts specified by the researcher. This equipment was used to initiate a new study aimed at supplementing newly weaned calves on pasture during a 45-day post-weaning period. Additionally, GPS-enabled eartags have been administered to the beef females on the ranch that will allow for monitoring of grazing distribution. This work targets animal presence in and around wind tower reclaimed areas. Corona successfully hosted our annual field day, which highlighted the various research projects at the ranch. Additionally, a delegation of scientists from countries throughout Africa spent time at the ranch learning about range livestock production. The ranch has also initiated a number of building projects that will increase housing capacity for educational events as well as a new laboratory space for sample processing. This laboratory space will also house water treatment equipment to service the Southwest Center for Rangeland Sustainability and provide an opportunity to conduct investigations on water quality and animal health and performance. The increase in research equipment and facilities will help to improve our research capacity and outreach efforts.



Research Highlights



Evaluation of Reproductive Parameters and Embryo Development in Beef Heifers Supplemented Rumen Undegradable Protein

Investigators: Taylor Andrews (Doctoral Student), Dr. Adam Summers, and Dr. Eric Scholljegerdes

Project Overview: Heifers offered a 50% animal sourced rumen undegradable protein (RUP) supplement had higher pregnancy rates than heifers offered a 36% animal-source RUP supplement. No differences in reproductive parameters were observed when heifers were offered a plant source 36% and 50% RUP supplement. The source and/or level of the RUP supplement might be the factor that can enhance reproductive performance in heifers. The objective of this study is to evaluate the source and level of RUP supplementation on the uterine environment and embryo development in beef heifers.

Meeting the Needs of New Mexico: In New Mexico, heifers are predominantly developed on native rangelands and producers face many challenges when developing their heifers. This research provides information on heifer development programs that can enhance reproductive success and profitability for Southwest beef producers. The overall goal of this study is to determine the physiological mechanism of RUP supplementation that enhances reproduction to better inform producers on different supplementation strategies to improve reproductive success in beef heifers grazing native rangelands.

Impacts: This project will provide beef producers with heifer development programs and supplementation strategies that can enhance reproductive success and profitability for their heifers.



Effects of By-Pass Protein on Weaned Calf Growth and Well-Being

Investigators: Eric Scholljegerdes (ejs@nmsu.edu) and Clayton Bedke (cbedke@nmsu.edu)

Project Overview: This project aims to investigate the impact of protein supplements that contain a high concentration of protein that by-passes ruminal degradation on weaned calf growth, glucose metabolism, stress hormones, and distribution in the weaning pasture. Calves were trained to consume supplements from an automatic feeder placed in the pasture which regulates supplement consumption based on electronic ID and treatment assignment. Calves were also fitted with GPS collars to monitor grazing distribution in the 2500-acre weaning pasture. Blood was collected to determine concentrations of cortisol (stress hormone), and metabolic markers. Laboratory work is on-going.

Meeting the Needs of New Mexico: Weaning is a stressful time in the life of a calf. Body weight and ability to cope with a new grazing environment and stress are critical for a healthy calf during the preconditioning phase of life. Provision of protein supplements that contain a high level of by-pass protein will increase amino acid supply for the building of protein but can also improve the energetic status of the calves. This will benefit the producer through better growth during the post-weaning phase and an improvement in health status during this stressful period.

Impacts: This experiment concluded in December; therefore, samples are currently being analyzed in the laboratory. Nevertheless, this work will inform producers on the advantages of feeding high by-pass protein supplements to pasture weaned calves, so that body weight loss during the highly stressful period immediately after weaning and recouping that loss with increased weight gain will provide a larger calf on sale day. This improvement in health and body weight could increase premiums paid for calves at sale.



Integrated Habitat Management for Livestock and Wildlife on the Corona Range and Livestock Research Center

Investigators: Eric Scholljegerdes, Louis C. Bender, and Shad Cox

Project Overview: The goal of this project is to investigate the infrastructure associated with wind turbine developments impact habitat for wildlife and domestic livestock throughout the Southwestern USA. In particular, the vegetation disturbance that results from clearing buffers around turbine pads, roads to access pads, and buried infrastructure between turbines alters native rangelands and hence large herbivore habitat. These areas are subsequently reclaimed following construction, usually with grass/forb seedings; however, exact reclamation seed mixes tend to be generic and are not necessarily tailored to specific sites or the nutritional needs of key species locally. Because of the extent of areas impacted (e.g., >1 mile² on the CRLRC), reclamations are in effect a large-scale habitat manipulation or management experiment, effects of which on large herbivores are unknown. However, reclamations can potentially significantly enhance habitat quality and grazing capacity if species mixes provide high-quality forages that are complimentary to the needs of large herbivores locally and align with overall habitat management goals. Given their cultural, economic, and ecological importance to the citizens of New Mexico, the primary goal of this project is to evaluate the potential benefit of reclaimed areas for wildlife and livestock in the context of overall habitat management for the needs of large herbivores on CRLRC.

Meeting the Needs of New Mexico: Understanding and enhancing the quality of CRLRC habitats for the full continuum of natural resources provides needed information for integrated management of rangelands for livestock, wildlife, and rangeland health. Because wind turbine development is increasingly common throughout New Mexico rangelands, identifying strategies that enhance habitat quality of rangelands from restoration actions alone or in combination with broader habitat management actions can facilitate development of strategies that enhance livestock management and reverse declining trends in key species such as mule deer.

Impacts: Beginning in 2024, 100 cattle were equipped with solar satellite ear-tag transmitters (ETTs) capable of collecting up to 4 real-time GPS locations per day. Distribution (i.e., “habitat use”) of cattle will be evaluated with respect to use of reclaimed areas on CRLRC, specifically whether reclamation sites are seasonally preferred, avoided, or neutral, and whether such use affects nutritional condition. Concurrently, ca. 40 passive infrared camera traps were established to similarly monitor wildlife use of reclamation sites and the CRLRC landscape in general, with an emphasis on mule deer distribution and demographics. Subsequent actions will involve evaluation of various seeding mixtures and other habitat management actions on distribution of livestock and mule deer and the overall health and productivity of these populations.



Influence of Wind Energy Development on Medium and Large Mammals

Investigators: Iona Rohan (irohan@nmsu.edu), Dr. Jennifer K. Frey, and Dr. Theresa M. Laverty

Project Overview: Researchers are investigating potential effects of wind energy developments on the habitat selection and behaviors of medium and large terrestrial mammals. The project is centered around the Red Cloud Wind Farm, located on the Corona Range and Livestock Research Center. We are using remotely activated wildlife cameras set within the wind farm, as well as at various distances from the wind farm. Between May and September 2024, we monitored wildlife activity using remotely activated cameras at 152 locations. The detections of terrestrial mammals on the cameras will be used to quantify differences in the habitat selection of terrestrial mammals as well as the amount of time an individual spends in front of a camera and how these aspects are affected by the intensity of wind energy infrastructure around surveyed sites.

Meeting the Needs of New Mexico: This project will benefit the citizens of New Mexico by providing a source of information regarding the current impacts of wind energy development to terrestrial mammals. Pronghorn and mule deer—ungulates with important economic and ecological roles in New Mexico—are the focal species for this project. Managing healthy ungulate populations for recreational hunting and as prey species to native predators is a top priority for land managers and state agencies and is a pursuit that many New Mexico citizens strongly support. Although the project is focused on wildlife, data on multi-species communities will be collected and allow for the investigation of potential impacts of wind energy development projects on cattle, a critical source of the economy for many New Mexico landowners.

Impacts: This project is important because although there have been substantial studies focused on the impacts of wind energy development on birds and bats, little information exists regarding the potential impacts of wind energy development on terrestrial mammals. The research that does exist is primarily focused on studies in the northern United States where ungulate populations are migratory and wind farms do not exert constant pressure on populations throughout the year. In central New Mexico, ungulates are an important non-migratory game species with home ranges impacted by wind energy development year-round. Central New Mexico is also experiencing a rapid increase in the scope of wind energy development projects throughout the ranges of native ungulates and other mid-sized terrestrial mammals. This project will serve as a critical information source to land managers, state agencies, and private landowners when pivotal decisions are made regarding the installation of wind farms within the home ranges of native ungulates.

Funding Acknowledgement: Upper Hondo Soil and Water Conservation District. NMSU #GR0007440



By the Numbers

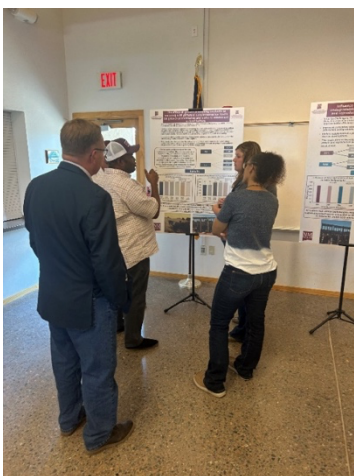


Grants and Contracts

- PI: Taylor Andrews. Primary Mentors: Adam Summers and Eric Scholljegerdes. Evaluation of reproductive parameters and embryo development in beef heifers supplemented rumen undegradable protein. USDA NIFA Predoctoral Grant. \$114,948. Grant was funded. Aug. 2023-Dec. 2025.
- PI: Taylor Andrews. Evaluation of reproductive parameters and embryo development in beef heifers supplemented rumen undegradable protein. Zoetis Inc. University Small Research Grant Program. \$3,200. Grant was funded through Zoetis donating synchronization of estrus products. Jan. 2024-Dec. 2025.
- PI: Taylor Andrews. Impacts of source and level of rumen undegradable protein on embryonic development in developing beef heifers. Reprologix Inc. donation. \$13,000. Reprologix donated time and services for research project. April 2024-April 2025.
- \$248,609 budget for the project from the Upper Hondo Soil and Water Conservation District spanning January 2023 - December 2025.

Outreach Activities

- Annual Field Day
- Livestock Nutrition Education
- Workshop on technology currently in use at the ranch and application to producers
- Scientific exchange with African Scientists
- US Beef Academy



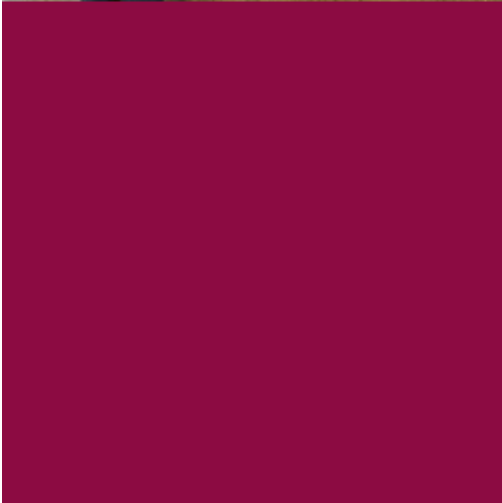
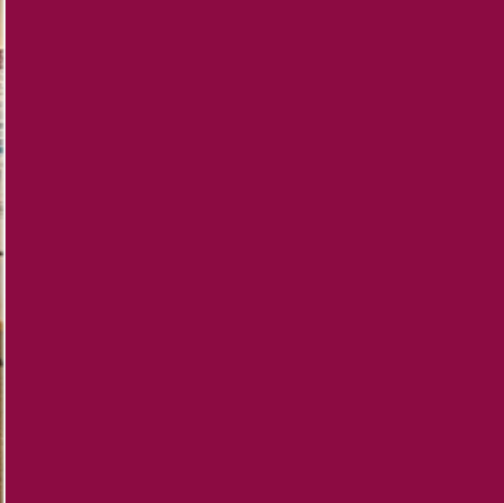
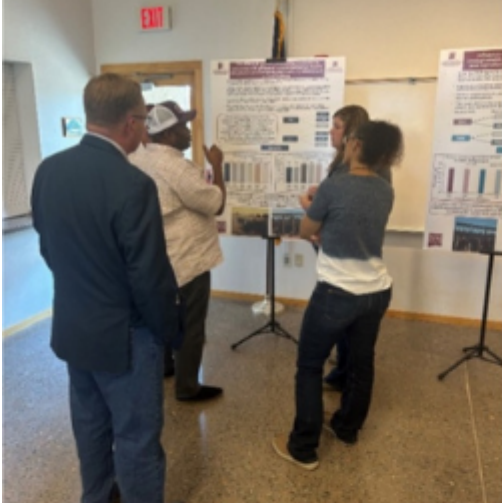
2024 Field Day



Scientific exchange with African Scientists



People



Cooperators and Collaborators

- Dr. Eric Scholljegerdes, NMSU, ANRS
- Dr. Adam Summers, ReproLogix
- Dr. Craig Gifford, NMSU, EASNR
- Dr. Marcy Ward, NMSU, EASNR
- Dr. Casey Spackman, NMSU, EASNR
- Dr. Glenn Duff, NMSU, ANRS
- Dr. Martha Desmond, NMSU, FWCE
- Dr. Sam Fernald, NMSU, ANRS/WRRRI
- Dr. Lara Prihodko, NMSU ANRS/ACES-AES
- Dr. Niall Hanan, NMSU, PES
- Dr. Bruce Carpenter, TAMU, AgriLife-Extension
- Dr. George Perry, TAMU, Animal Science
- Dr. Robert Cushman, USDA-ARS, Meat Animal Research Center
- Dr. Ryan Ashley, NMSU, ANRS
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- Dr. John Wenzel, NMSU, ANRS
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- Dr. Clint Loest, NMSU, ANRS
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- Dr. Dean Fish, Santa Fe Ranch Foundation
- Dr. JP Pollreisz, Zoetis
- Dr. Gary Sides, Zoetis
- Dr. Clay Burson, Purina
- Dr. Jason Russell, Zinpro
- Kevin Millner, Zoetis
- Daniel Ceballos, Zoetis
- Jason and Katy McDonald, Fess Parker Cattle Co.
- Dr. Chris Allison, NMSU, EASNR
- Dr. Paul Gutierrez, NMSU, CES/Ag Econ
- Leanne Sanders, IMI Global
- Dina Chacon-Rietzel, NMBC
- Dr. Jennifer Frey, NMSU FWCE
- Judy Bock Upper Hondo SWCD (District)
- Dr. Theresa Lavery, NMSU FWCE
- Danica Cooke, Wildlife Biologist BLM

Advisory Committee

- Barbara Sultemeier – Chair
- Dr. James Miller
- Scott Shaefer
- Tom Perkins
- Tony Johnson
- Kyle Traylor
- Kendall Wilson

Graduate Students

- Taylor Andrews, PhD
- Clayton Bedke, PhD

ASC Personnel

- Shad Cox, Superintendent, Corona Range and Livestock Research Center
- Richard Dunlap, Ranch Manager
- Eric Scholljegerdes, Professor, Animal and Range Sciences, Research Coordinator, Chair of steering committee