



### Mission Statement

The Department of Animal and Range Sciences is committed to providing premier programs to those we serve by focusing on education, research, and outreach.



### ACES Pillars for Economic and Community Development

Food and Fiber Production and Marketing

Water Use and Conservation

Family Development and Health of New Mexicans

Environmental Stewardship

Foundational Education and Training

**Research conducted in animal science and rangeland resources benefits livestock producers and land managers in semi-arid environments, and allows for training of students to be future leaders in the industry.** Students majoring in animal science or rangeland resources are provided with the very best hands-on academic instruction by our faculty. Fully equipped labs allow students access to cutting-edge research in livestock nutrition, genetics, physiology, endocrinology, meat science, wool, toxicology, watershed and rangeland ecology, weed and brush control, plant systematics, and grazing management. All programs are designed to offer a wide array of coursework that provides scientific, technical, and practical experience in a real-world setting. The department is very hands-on, with farms and animals located right on campus. Several options exist to specialize and concentrate your field of study, including minors in human animal interaction, horse management, dairy science, livestock production, ranch management, and range science.

### Selected Program Impacts

- **Secured over \$2.1 million in funding and in-kind donations.** For every dollar we bring in from state and federal sources, we bring in \$5.00 more from outside sources.
- **Currently training 32 graduate students and 15 undergraduate students** in research techniques related to livestock production, range management, and water science at three agricultural science centers and on-campus livestock farms.
- **Placental development in sheep as a model to study pathological pregnancies and tumor biology.** Attachment and implantation of the embryo into the maternal endometrium and subsequent development of the placenta (referred to as placentation) is central to pregnancy success. Using sheep as a model, we are able to address gaps in knowledge relevant to agricultural production concurrent with biomedical research in the hopes of identifying novel targets for diagnosis and treatment of both pathological pregnancies and cancer. We established an innovative *in vivo* model to study the placental microenvironment, specifically immune cell populations and vascularization.
- **Genetic selection could help reduce concerns with livestock grazing on public lands.** Cattle tend to graze near streams and gentle terrain, which can adversely impact fisheries and wildlife habitat. A collaborative team led by NMSU is developing tools for ranchers to select cattle that are more willing to use rugged terrain and travel farther from water. Using genomics, GPS tracking, and geographic information system technologies, researchers identified genetic markers associated with cattle movements and plan to develop breeding values for cattle distribution patterns using relatively inexpensive DNA tests.
- **Light grazing can reduce rancher drought risk in the Chihuahuan Desert.** A major managerial challenge confronting ranchers on desert rangelands is that periodic droughts necessitate destocking to avoid harmful impacts on soils, vegetation, and livestock. Over a 30-year period, NMSU researchers have evaluated the influence of light, conservative, and moderate stocking levels on cattle and forage productivity on Chihuahuan Desert rangelands. Recent data indicate light grazing involving 21–30% is best suited for ranchers who prefer a passive, low-risk, low-input



## Selected Program Impacts (cont.)

approach. Light grazing lowers the need for destocking under drought conditions, reduces supplemental feed costs, maximizes range improvement, and facilitates range recovery after drought. It allows ranchers with high-quality herds of adapted livestock to reduce the risk of complete herd liquidation during periods of extended drought.

- **Growth-promoting implants increase weaning weights without impacting reproduction.** Growth-promoting implants have been utilized by the beef industry in suckling calves to improve efficiency of gain. However, previous studies suggest mixed results when utilizing implants in female progeny. As a result, many producers hesitate to utilize growth promotants on heifers since selection for animals retained in the herd has yet to occur. Providing growth-promoting implants to heifers at 3 months of age increased weaning weight by 8% (40 lb) without reducing pregnancy rates. These data suggest providing growth promotants to heifers prior to weaning may improve cattle growth and the amount of product available for producers to market.

## Faculty and Expertise

### Animal Sciences

- **Ryan Ashley**, Associate Professor, Reproductive Physiology
- **John Campbell**, College Assistant Professor, Judging Team Coordinator
- **Glenn Duff**, Professor, Ruminant Nutrition
- **Gaylene Fasenko**, Associate Professor, Companion Animals
- **Jennifer Hernandez-Gifford**, Associate Professor, Reproductive Physiology
- **Shanna Ivey**, Interim Department Head/Professor, Rumen Microbiology
- **Clint Loest**, Professor, Ruminant Nutrition
- **Tim Ross**, Emeritus Professor, Sheep Production
- **Eric Scholljegerdes**, Associate Professor, Ruminant Nutrition
- **Adam Summers**, Assistant Professor, Reproductive Physiology
- **Sergio Soto-Navarro**, Professor, Ruminant Nutrition
- **Laura White**, Associate Professor, Equine Science

### Range Science

- **Derek Bailey**, Professor, Grazing Management and Behavior
- **Andres Cibils**, Associate Department Head/Professor, Grazing Management and Ecology
- **Akasha Faist**, Assistant Professor, Rangeland Ecology
- **Alexander "Sam" Fernald**, Professor, Water Quality Hydrology
- **Sara Fuentes-Soriano**, College Assistant Professor, Herbarium Curator
- **Amy Ganguli**, Associate Professor, Disturbance Ecology
- **Hatim M.E. Geli**, Assistant Professor, Landscape Hydrology
- **Jerry Holechek**, Professor, Ecology/Grazing Systems and Management
- **Kirk McDaniel**, Emeritus Professor
- **Lara Prihodko**, College Associate Professor, Landscape Systems

## Selected Partnerships and Collaborators

- NMSU AES Agricultural Science Centers
- NM Department of Agriculture
- NM Cattle Growers
- NM Wool Growers
- Society for Range Management
- NMSU Range Improvement Task Force
- Elephant Butte Irrigation District
- New Mexico Acequia Association
- Multiple livestock breed associations, cooperatives, and producer groups
- Feed and pharmaceutical companies, including Westway Feed Products, Hi-Pro Feeds, Paul's Veterinary Supply, Merck, Zoetis, Cargill, and Elanco
- USDA and USDI federal agencies, including BLM, NRCS, EPA, Forest Service, Fish and Wildlife Service, and Valles Caldera National Preserve
- Numerous universities, including Texas A&M University, Oklahoma State University, University of Nebraska, University of Arizona, Texas Tech University, San Angelo University, and North Dakota State University
- USDA-ARS Research Laboratories, including Fort Keogh, Miles City, MT; Meat Animal Research Center, Clay Center, NE; Jornada Experimental Range, Las Cruces, NM; and Northern Great Plains Research Laboratory, Mandan, ND