

# Animal Environmental Systems

**Goal:** Colorado State University will enhance its focus, depth, and integration in undergraduate education, graduate education, research, and outreach in environmentally sound systems for animal production units and be recognized as the leading university program in the West and among the top five university programs nationally in cattle and equine environmental systems. This will include experiential learning in courses contributing to the BS in Animal Sciences, Equine Sciences, and Soil and Crop Sciences designed to add practical experience in the science and applications of environmental management systems for air and water quality protection related to animal production systems. Graduate education, research, and outreach will consist of masters and doctoral degree programs related to livestock nutrition and management, soil science, engineering, and economics of waste management systems and the evaluation of production systems and regulatory protocols for effective environmental protection.

**Purpose:** In 2007, live meat animal sales in Colorado were valued at \$3.48 billion and the value of dairy production was \$516 million. Livestock and livestock products accounted for 76.8% of crop and livestock sales in Colorado. The Colorado horse population is 194,000 with an economic value of \$754 million. Cost effective technologies to protect soil, water, and air quality near livestock production sites is one of the most limiting factors to growth in the livestock industries. Livestock production in the South Platte Basin is known to have resulted in nitrate contamination of groundwater and elevated phosphorus levels in reservoirs. Water quality issues are not limited to nutrients, but could include pathogens and pharmaceuticals. The Arkansas Basin, Great Plains, and Tri-River Area (Gunnison, Uncompagre, and Colorado Rivers) on the West Slope face similar issues. Over the last decade livestock operations have become more concentrated, thus multiplying the potential for environmental hazards. Rapid urbanization along the Front Range has led to increased competition between urban and rural water uses and increased conflict between urban and rural people. Regulatory enforcement has increased at both federal (EPA) and state (Colorado Water Quality Control Commission and Colorado Air Quality Control Commission) levels.

Colorado State University is in a strong position to assist with the economic development of Colorado's livestock and equine industry, to enhance environmental quality, and to enhance the public health of citizens with improved livestock environmental solutions by educating livestock and equine industry professionals and small acreage owners in best management practices for nutrient management, odor and dust control; researching technical and economic issues related to improved animal production practices; and being actively involved with livestock and equine industry personnel, governmental agencies, and small acreage owners, to assure that the latest knowledge is incorporated in management and regulatory decisions.

## Strategic Actions:

- Development and implementation of the newly established Institute for Livestock and Environment; goals of the Institute are to develop new approaches for animal environmental system research management to be more cohesive and more responsive to industry and regulatory issues and develop new approaches with which to transfer technology from research to industry and governmental partners; the Institute will organize continuous relationships with livestock production organizations and regulatory agencies to create the position of knowledge leader in the topic area;
- Develop Colorado industry funding mechanisms, like market order systems, to provide sustainable sources of revenue for research and educational work in animal environmental systems.
- Develop an active graduate program in animal environmental systems, thereby, attracting more graduate students in this area to CSU.

## Critical Resource Growth Needs:

- Seek additional funding to promote current research coordinator to full – time status.
- Add a producer-based research investment fund of \$500,000 annually to support animal environmental research and education, and increase grant funding.

## Personnel:

Administrative Advisor: Lee Sommers

Steering Committee Chair: [Jessica Davis](#)

Steering Committee Members: Shawn Archibeque, Sybil Sharvelle, Michael Carolan, Mike Lacy, Maria Fernandez-Gimenez, Frank Garry