Land-Use Challenges for Animal Agriculture

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Hosted by the American Society of Animal Science
**SCHEDULE:**

**10:05–10:10 AM**  
Introduction and Goals  
Dr. Deb Hamernik  
University of Nebraska  
ASAS Public Policy Committee Representative

**10:10–10:35 AM**  
Land Use  
Dr. Doug Tolleson  
University of Arizona  
Associate Extension Specialist/Research Scientist

**10:35–10:50 AM**  
Questions and Answers

Products from livestock grazing are an important source of quality nutrition for humans. World consumption of animal products is on the rise and is predicted to continue significantly, especially in developing countries (Henning and Steinfeld, 2003). As humans, we are obligated to ensure that our methods to achieve and maintain a food-security infrastructure are compatible with the landscapes that we use. We are aware that carelessly implemented agricultural practices can permanently harm landscapes and the inherent ecosystem services (benefits). Therefore, we must always strive to create those agricultural systems that balance the need to ensure adequate food production to meet the nutrition demands of a growing population with the duty to value and maintain the land’s ecological attributes. But, herein we find the dilemma.

![Diagram](image)

Two pathways to improve the sustainability of specialized livestock farms.

**Emergent systems**

1. Biogas production
2. Smart agriculture) genetic and precision agriculture for crops and animals)
3. Introduction of crops for protein self-sufficiency
4. Introduction of cash crops (+ conservation agriculture)
5. Developing exchanges with specialized cash crop farms
6. Label for grassland-based animal products
To what extent do we utilize a landscape for food production at the expense of other ecosystem services? Furthermore, should humans abandon long-proven sustainable agricultural systems to return popularized ecosystem services to the landscape? These are but a few of the many related questions that challenge the world’s political systems and leaders in determining how to feed a growing world population in years to come.

What we know to be constant across the world is the need for nutritious foods and the importance of ecological benefits inherent to the grazing lands we use. However, the political views within and across the world’s nations of how these questions should be answered are controversial and diverse, which posed some challenge in addressing land use and animal agriculture on a worldwide basis in the October 2015 issue of Animal Frontiers.

The environmental impacts, health concerns, consumer preferences, and sustainability of production require a change in livestock systems toward more ecological practices. Livestock sustainability can be enhanced through two main ecological modernization pathways (efficiency substitution or biodiversity based) that have different impacts on land use in terms of the degree, scale, and nature of changes. Individual stakeholders and economic and social organizations can foster one or the other pathway according to their viewpoint and interest. Therefore, a structured representation of livestock systems as social-ecological systems, highlighting key interactions among grasslands, crops, animals, farmers, actors in the supply chain, and natural resource managers, may help stakeholders to identify current sustainability issues and the possible future of livestock systems (Duru et al., 2015).

As we progress in our discovery, awareness, and recognition of nonagricultural benefits of the lands that we use for livestock production, we are faced with the challenge of how best to balance the use of the earth’s grazing resources for food production with the need to preserve, in whole or in part, the multitude of natural benefits that these lands provide.

References and Additional Information


DOUG TOLLESON is an extension rangeland specialist and research scientist for the University of Arizona. He has been located in Camp Verde at the V Bar V Ranch Agriculture Experiment Station since January 2008. Previous experience includes 9 years as Director of the Grazingland Animal Nutrition Lab at Texas A&M University, 10 years as a Research Associate for Texas A&M in Vernon and Uvalde Texas, and 3 years in a similar position with the University of Arkansas at Booneville. He has worked on cattle and horse ranches in Texas and Arkansas. International experience includes projects to develop range, animal nutrition, and near infrared spectroscopy capacity in Mexico, Mongolia, Mali, India, Ethiopia, Kenya, Uganda, and Tanzania. He is a past President of the Arizona Section, Society for Range Management and is currently the liaison to the Society for Range Management for the American Society of Animal Science. He earned a BS in Animal Science, MS in Reproductive Physiology and a PhD in Rangeland Ecology and Management from Texas A&M University.

DEB HAMERNIK is Associate Dean, Agricultural Research Division; Associate Director, Nebraska Agricultural Experiment Station; and Professor, Department of Animal Science at the University of Nebraska-Lincoln. She earned a B.S. from the University of Nebraska-Lincoln in animal science; M.S. from Washington State University in animal science; and Ph.D. from Colorado State University in Animal Physiology. She conducted postdoctoral research in the Department of Pharmacology at Case Western Reserve University. From 2000-2001 she served as Scientific Review Administrator in the Center for Scientific Review at the National Institutes of Health (NIH). From 1997-2000 and 2001-2009 she served as National Program Leader, Animal Physiology at the USDA-Cooperative State Research, Education and Extension Service (CSREES; renamed the National Institute of Food and Agriculture, (NIFA) in 2009) in Washington, DC. In 2008 she was one of the first two National Program Leaders to be inducted into the CSREES Hall of Fame and in 2004 she received the CSREES Employee of the Year Award in Science and Education.

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