

Balancing Animal Agriculture And Communities

Agenda

February 29, 2008

- 8 a.m. **Registration**
- 8:20 a.m. **Welcome**
 Tom Coon, director, Michigan State University Extension
- 8:40 a.m. **How did we get here?**
 A historical overview of livestock production and rural communities
 Wendy Powers, director of environmental stewardship for animal agriculture,
 MSU
- 9:10 a.m. **Prominent community concerns about animal agriculture**
 Moderated by Rep. Jeff Mayes, District 96, Saginaw Bay
- 9:15 a.m. **Comparative effects of animal agriculture air emissions on human and
environmental health**
 Roger McClellan, former president, Chemical Industry Institute of Toxicology,
 Research Park Triangle, N.C.
- 9:45 a.m. **Comparative effects of animal agriculture on aquatic ecosystem integrity**
 George Vellidis, professor of biological and agricultural engineering,
 University of Georgia.
- 10:15 a.m. **Break**
- 10:30 a.m. **Comparative effects of animal agriculture on real estate values**
 Glynn Tonsor, assistant professor of agricultural economics, MSU
- 11 a.m. **Comparative effects of animal agriculture on quality of life in surrounding
communities**
 Jeff Sharp, associate professor of rural sociology, The Ohio State University
- 11:30 a.m. **Group discussion**
 Facilitated by Geoffrey Habron, associate professor of fisheries and wildlife, MSU
- Noon **Lunch**
- 1:20 p.m. **Animal agriculture today: options and tradeoffs**
 Moderated by David Hollister, president, Prima Civitas Foundation, Lansing
- 1:35 p.m. **How technology and management affect on-farm activities**
 Richard Hegg, national program leader, plant and animal systems,
 U.S. Department of Agriculture
- 2:20 p.m. **Community response to evolving animal agriculture**
 William Flinn, director of the Social Responsibility Initiative,
 The Ohio State University
- 3:05 p.m. **Break**
- 3:20 p.m. **Tell us what you think**
 Facilitated by Frank Fear, senior associate dean, College of Agriculture and
 Natural Resources, MSU
- 4 p.m. **Conference closes**

Tom Coon

Director

Michigan State University Extension

Dr. Thomas Coon is director of Michigan State University Extension and a professor in the Department of Fisheries and Wildlife at MSU. He is responsible for providing leadership to an organization that has more than 1,200 staff and faculty members both on campus and in each of Michigan's 83 counties. He oversees an annual budget of more than \$84 million. In previous administrative assignments, Dr. Coon served as associate dean for graduate and international programs in the College of Agriculture and Natural Resources and as associate department chairperson and acting chairperson in the Department of Fisheries and Wildlife.

Dr. Coon's expertise is in aquatic ecology and aquatic ecosystem management. In his 25 years as a university instructor, he has taught a variety of courses on aquatic ecology, fish biology and natural resource management, and has advised hundreds of undergraduate students studying fisheries and wildlife curricula. He has developed an applied research program focused on fish population responses to environmental change. His work has addressed a variety of species, ranging from freshwater mussels to tropical fish, and aquatic ecosystems ranging from small headwater trout streams to the Great Lakes.

Dr. Coon received his bachelor's degree in biology from Luther College in 1976 and a master's degree and a doctorate in ecology from the University of California-Davis in 1978 and 1982, respectively.

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Wendy Powers

Director of Environmental Stewardship for Animal Agriculture
Michigan State University

Dr. Wendy Powers is a professor and the director of environmental stewardship for animal agriculture in the departments of Animal Science and Biosystems and Agricultural Engineering at Michigan State University. She joined MSU in November 2006 after serving on the faculty at Iowa State University for nearly 10 years.

As director, Dr. Powers coordinates environmental activities related to animal agriculture in the College of Agriculture and Natural Resources. Her primary research focus is on diet modification to alter odor and gaseous emissions and manure nutrient excretion in multiple species. Her MSU Extension work currently focuses on implementation of management practices to reduce environmental impact and addressing the concerns of rural residents by improving understanding and communication.

Dr. Powers received a bachelor's degree from Cornell University in 1989 in animal science and received her doctorate in animal science and master's degree in dairy science from the University of Florida in 1997 and 1993, respectively.

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How Did We Get Here?

Wendy Powers

Livestock systems and rural communities in Michigan have undergone enormous changes in the past 50 years. There have been accompanying changes in the regulatory environment and social norms. The purpose of this talk is to outline some of the primary drivers behind these changes, which, in turn, frame discussions for future developments.

Total livestock output in Michigan has stayed the same or increased for many types of livestock, but production per animal has increased substantially. The number of farms producing livestock has decreased as farms have become larger and more specialized. There also has been a tendency toward specialization in livestock and crop production, making many livestock farms net purchasers of feed and exporters of manure to crop farms. This has caused manure production and manure utilization to become uncoupled and raised concerns over the environmental impacts of manure storage and application.

Rural communities have changed as well. Many rural residents are not engaged in farming, and a smaller percentage of rural residents are actively engaged in agricultural professions and are knowledgeable in modern production practices. Historically, many crop farmers had some livestock and were engaged in some agricultural activity every month of the year. That is less true today. The crop farmer may be very active in his machine shop in the off season but is not raising livestock. Though many rural residents desire some of the benefits that living in a rural setting provides, such as the ability to own horses or privacy from neighbors, they also desire attributes of urban life such as paved roads, Internet access, etc. In turn, the tradeoffs of living in an agricultural area, including dust, odor and snow removal, become problematic.

Jeff Mayes

State Representative, District 96, Saginaw Bay

State Rep. Jeff Mayes is committed to improving the quality of life in his Saginaw Bay community and expanding opportunities for mid-Michigan's working families, children and senior citizens. His priorities include increasing investment in renewable, alternative fuels of the future such as ethanol and biodiesel; driving down the cost of gas for consumers by increasing the availability of ethanol and biodiesel and decreasing Michigan's dependence on foreign oil; and protecting working families from corporate crooks who threaten workers' pensions and 401(k)s.

Rep. Mayes has been active in area politics for more than a decade and managed several high profile local campaigns, including the election and reelection of former state Rep. A.T. Frank of Saginaw.

He received a bachelor's degree in political science in 1994 from the University of Michigan, where he was an Evans Scholar.

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Roger McClellan

Former President, Chemical Industry Institute of Toxicology

Roger McClellan, the former CEO of the Chemical Industry Institute of Toxicology, advises public and private organizations on issues surrounding inhalation toxicology and human health risk analysis. He is an internationally recognized authority in inhalation toxicology, aerosol science and human health risk analysis. He frequently speaks on risk assessment and air pollution issues in the United States and abroad. He is a strong advocate of risk-based decision making and the need to integrate data from epidemiological, controlled clinical, laboratory animal and cell studies to assess human health risks of exposure to toxic materials.

He received his doctor of veterinary medicine degree (with highest honors) from Washington State University in 1960 and a master's of management science degree from the University of New Mexico in 1980. He is a diplomate of the American Board of Toxicology, a diplomate of the American Board of Veterinary Toxicology and a fellow of the Academy of Toxicological Sciences.

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Comparative Effects of Animal Agriculture Air Emissions on Human and Environmental Health

Roger McClellan

Concern for the quality of the air no doubt predates recorded history. These concerns are multifold: impaired visibility, unpleasant odors, adverse effects on the health of people and animals, impacts on the environment and, more recently, impacts on the climate and related macro-scale environmental change. The spatial dimensions range from the breathing zone of individuals to where people live and work to communities to regions to nations and, more recently, to global considerations. The temporal dimensions range from immediate to hours to days to years to lifetimes and, more recently, global impacts that may occur over centuries.

Societies have reacted to concern about air quality by passing laws and creating regulations including both penalties and economic sanctions and incentives. In the United States, the Clean Air Act (CAA), passed in 1970 and administered by the U.S. Environmental Protection Agency, is the principal legislation regulating air quality. The basic elements of the CAA will be described, and specific aspects of how it has been implemented will be illustrated for pollutants of concern because of their agricultural contributions and their impacts on people and animals. Emerging conflicts will be described between the current approach mandated by law that considers each air pollutant separately (e.g., particulate matter, ozone, carbon monoxide, hydrogen sulfide, benzene, etc.) and each kind of media independently (e.g., air, water and soil) and the setting of human health-based standards without consideration of cost versus the need for a more holistic system orientation extending from local to global dimensions and consideration of both benefits and costs. The role of science and policy judgments in establishing air quality standards will be discussed. This will also include drawing the distinction between scientists expounding on science and scientists advocating their personal preferences for desired outcomes.

Scientists from multiple disciplines using a holistic system approach and working together can have great impact in helping to identify scientific issues, developing scientific information to resolve uncertainties and synthesizing science to inform policy decisions. Scientists, like all members of society, should feel free to express their personal preferences on the desired policy and outcomes. However, failure of scientists to distinguish between science and their personal preferences threatens to erode public confidence in scientists and science.

George Vellidis

Professor of Biological and Agricultural Engineering University of Georgia

George Vellidis' research focuses on measuring, modeling and limiting the environmental impacts of agricultural production systems. He has conducted research on and developed recommendations for using riparian (streamside) forests as buffers for nonpoint source pollution and has studied the environmental impacts of animal agriculture from the field scale to the large watershed scale, including the water quality impacts of land application.

He is currently the project leader of two large multidisciplinary water quality projects. The first is focused on understanding and explaining the relationships between dissolved oxygen, water quality and natural stream ecosystems in the coastal plain of Georgia. The second is evaluating long-term water quality responses to conservation practices in nested coastal plain watersheds. This project is one of 13 federally funded Conservation Effects Assessment Program (CEAP) projects. Dr. Vellidis is also one of five scientists leading a national project to synthesize and analyze the 13 CEAP projects.

George Vellidis received his doctorate in agricultural engineering with a minor area of emphasis in environmental engineering from the University of Florida in 1989 and his master's and bachelor's degrees from the Virginia Polytechnic Institute and State University in 1985 and 1983, respectively.

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Comparative Effects of Animal Agriculture on Aquatic Ecosystem Integrity

George Vellidis

There is little debate that animal agriculture can have significant detrimental effects on aquatic ecosystem integrity if not managed properly. Animal agriculture primarily affects water quality either by manure moving directly to streams, rivers and lakes, or by nutrients and pathogens released from manures moving to groundwater and/or surface waters. This has been documented by many research groups over the past two decades. Many of these findings are included in a comprehensive review of the literature published by the Minnesota Environmental Quality Board.

The burning issue, therefore, becomes what type of management and how much management are needed to maintain acceptable aquatic ecosystem integrity. Although we can also endlessly debate acceptable ecosystem integrity, for today, let us agree to define acceptable ecosystem integrity as that which we find in rivers and streams in watersheds that are relatively free of urban areas and intensive agricultural production. In most such settings, rivers and streams would be characterized by stable, non-eroding channels, little to no sediment transport, low concentrations of nutrients (nitrate + ammonium concentrations below 300 µg/L and phosphate concentrations below 30 µg/L), relatively low concentrations of enteric indicator bacteria, and high macroinvertebrate and other aquatic species diversity.

Dr. Vellidis will present results from a number of studies that have compared the water quality in streams with and without animal agriculture in the contributing watersheds. For example, biological monitoring is a useful tool for assessing water quality because some types of aquatic biota are sensitive to environmental disturbances and thus serve as continuous monitors of their environment. Benthic macroinvertebrates have been identified as aquatic biota that can serve as indicators not only because they are sensitive to changes but because they are relatively abundant and can be readily sampled. They are also a key component of the aquatic food web, and any change in their populations also affects other aquatic species that depend on them. Several studies have shown that streams that are affected by animal agriculture have much lower macroinvertebrate diversity, lack macroinvertebrate species that require good water quality and are dominated by species that are tolerant of disturbance.

Installing or maintaining healthy riparian buffers is a management practice that has been shown to be effective at reducing the concentrations of nonpoint source pollution leaving all types of agricultural production sites, including manure land application sites. Other successful in-field and edge-of-field management strategies for reducing the effects of animal agriculture on water quality will be presented during the oral presentation.

Glynn Tonsor

Assistant Professor of Agricultural Economics
Michigan State University

Dr. Glynn Tonsor joined the MSU agricultural economics faculty as an assistant professor in May 2006. His current efforts are primarily devoted to research and extension activities. Dr. Tonsor's broader research interests cover an array of issues throughout the supply chain in food industries, with particular focus on the cattle/beef and swine/pork industries. Particular interests span the supply chain and range from production level issues to improving information transfer and improving quality control throughout food production and handling to end-user consumer issues.

He received a bachelor's degree from Missouri State University and a Ph.D. from Kansas State University.

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Comparative Effects of Animal Agriculture On Real Estate Values

Glynn Tonsor

Changes in real estate valuations have long been a central point of concern in discussion of the impacts of animal agriculture on communities. The purpose of this talk is to outline what the peer-reviewed literature suggests regarding property valuation impacts of animal agriculture. The literature covered considers impacts of various livestock species, sensitivity of impacts to factors including distance from facility location and wind direction, and facility size. Furthermore, this talk will highlight impacts not only on residential property values but also on surrounding farmland valuations.

Jeff Sharp

Associate Professor of Rural Sociology The Ohio State University

Dr. Sharp's focus is on agricultural and community change at the rural-urban interface as well as public attitudes about topical food, agricultural and environmental issues (he recently looked at matters such as local foods, animal welfare, energy and large-scale livestock facilities).

Dr. Sharp has been involved in many service projects and serves as the program area leader of the Rural Sociology Program in the Department of Human and Community Resource Development at The Ohio State University. He was on the executive committee for the Social Responsibility Initiative in the College of Food, Agriculture and Environmental Sciences and serves as a board member for the Countryside Conservancy in Cuyahoga Valley National Park.

Dr. Sharp received his doctorate in sociology in 1998, his master's degree in rural sociology in 1994 and his bachelor's degree in political science in 1990, all from Iowa State University.

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Comparative Effects of Animal Agriculture on Quality of Life in Surrounding Communities

Jeff Sharp

Three matters pertinent to the relationship of animal agriculture to the communities in which animal agricultural production occurs will be briefly addressed. A first point is to simply acknowledge the obvious changes that contribute to the matter of community and agriculture being discussed. Over the past 50 years, substantial changes in the structure of agriculture have occurred, with a central theme being increased scales of production and increased coordination and concentration throughout the system. The production systems of today are much different than were systems a generation or two ago. As a result, the number of farmers has generally decreased in most rural locales.

A second observation is that the impacts of animal agricultural development can occur at a variety of geographic scales, so the issues for adjoining neighbors might be different than those for the community or county. Sharp's direct research has looked closely at the state and regional context, but tools are available to help us to understand local impacts. Impacts may be economic, psychological, cultural, social or environmental, and can vary temporally. For example, considerable psychological or social impacts may occur even before an animal agriculture facility has broken ground. Once a development has occurred, a variety of new impacts might occur and earlier impacts continue. There may now be impacts on local infrastructure, grain markets, the environment, etc. A challenge throughout this process is to find ways to ameliorate these various impacts. Effective land use planning is one tool that communities have sought to isolate and reduce negative impacts of some development, but unfortunately, many rural places do not have the authority to implement some of these tools, for a variety of reasons. The end result is that effective efforts to mitigate negative impacts may come up short if diverse interests cannot find common ground and acceptance.

A final observation is that there may be merit in trying to develop social relationships between farmers and nonfarmers. In Ohio, a substantial number of urban and even rural people have no regular contact with farmers. There are several possible benefits of such relationships. At the immediate neighborhood level, it can be beneficial for there to be trust in the risk managers (in this case, the livestock farmer). At a more general level, the increasing distance between food production and the society that consumes that food can lead to actions and policies that may be unfavorable to agriculture. The upside, at least in Ohio, is that farmers are regarded quite well in urban and rural areas, and that is an asset to be taken care of.

There is no magic bullet for resolving problems, but with a greater appreciation for the social dimensions of the issue, it may be possible eventually to develop a shared understanding of the problems and identify ways to meet the needs of the increasing and diverse rural landscape stakeholders.

David Hollister

President Prima Civitas Foundation

David Hollister is president and CEO of the Prima Civitas Foundation, a Lansing-based nonprofit organization that takes a regional approach to boosting Michigan's economy. The former mayor of Lansing, Hollister was appointed director of the Michigan Department of Consumer and Industry Services (CIS) in January 2003. Later that year, CIS joined with the Michigan Department of Career Development, the Michigan Economic Development Corporation and the Michigan Broadband Development Authority to form the Michigan Department of Labor and Economic Growth.

Hollister has dedicated his entire life to public service. He began his career as a high school teacher in the 1960s after graduating with honors from Michigan State University. His political career began during his tenure as a teacher in the Lansing Public Schools, when he was elected in 1968 as an Ingham County commissioner, serving through 1974. In 1974, he launched a successful campaign for the Michigan House of Representatives, where he served until 1993.

In 1993, he ran a successful campaign for mayor of Lansing, and he was reelected to his third term in a landslide victory in November 2001. Hollister's successes as mayor included over \$2.9 billion in investments, including building a new regional transportation center downtown, bringing minor league baseball to Lansing, and striking a partnership with the state of Michigan that includes new buildings for the legislature, the supreme court and various other departments.

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Richard Hegg

National Program Leader, Plant and Animal Systems
U.S. Department of Agriculture

Richard Hegg manages animal manures from confined animal feeding operations to prevent air, soil and water pollution. His interests include alternative treatment technologies and production systems, value-added products, feed management, odor control, economics and rural community issues.

Dr. Hegg has a doctorate and master's and bachelor's degrees in agricultural engineering from the University of Minnesota, the University of Missouri and South Dakota State University, respectively.

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How Technology and Management Affect On-Farm Activities

Richard Hegg

The livestock and poultry industry faces many environmental constraints. Most states have regulations on manure management to protect water quality, and there will be a new federal regulation in 2008. There is also a national air quality monitoring study that started in 2007 to measure emissions for dairy, poultry and swine facilities. After this study is completed, federal air quality regulations for livestock and poultry facilities are likely. With larger production facilities and limits on nitrogen and phosphorus applications from manure, producers are going to look increasingly for technologies to recover nutrients. Adopting new technologies will require initial investment and operating costs. This means the producer will have to acquire additional management skills or contract out the manure management operation to a specialist. This may prove difficult for the smaller family farm operations

Dr. Hegg will address some of the trends for addressing the environmental concerns. For instance, the industry will continue to move toward large concentrated production facilities and the fate of pathogens and pharmaceuticals will be of increasing importance. Air quality will continue to be an important issue. Cost-effective recovery of manure contents (fiber, chemicals, energy, etc.) will allow for expansion of a viable treatment industry. Technology providers will install the treatment facility and also manage and operate it.

He will also address some of the visions for addressing the environmental concerns. There will be national coordination among stakeholders for research, outreach and education, and an expanded resource base of scientists/engineers and funding. Science-based solutions will be used by policy-makers to make policy decisions. Administration of the manure system after its implementation will be contracted out to specialized companies. Waste management plan implementation will be required and monitored by the state regulatory agency. More financial assistance will be provided for producers to implement their manure management plans.

The presentation will also describe some technology options for manure management such as aeration, biofilters and dust control to maintain air quality in and around livestock and poultry production facilities. There are options for collection, storage, transport, treatment and utilization for liquid, slurry or solid manure management systems. Some of these systems may recover and process manure components for value-added products (e.g., oil-absorbing pads and horticultural containers) or use manure as an energy source (anaerobic digestion and gasification).

William Flinn

Director of the Social Responsibility Initiative
The Ohio State University

Bill Flinn is director of the Social Responsibility Initiative in the College of Food, Agriculture and Environmental Sciences at The Ohio State University. He is a professor of rural sociology and sociology and a distinguished rural sociologist of the Rural Sociological Society.

During his 30-year career, he has worked in more than 55 countries on a wide variety of development projects, especially at the community level. His current research in Ohio focuses on the social impact assessment of large farms and ethanol plants on local communities.

Flinn has a doctorate and a master's degree in rural sociology and a bachelor's degree in agricultural economics from the Ohio State University.

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Community Response to Evolving Animal Agriculture

William Flinn

There is considerable debate about the impacts associated with agricultural industrialization in animal agriculture. Some argue that one's position within the agricultural economy is an important determinant of the response to and interpretation of the process of industrialization in agriculture and its effects on the community. They view agricultural industrialization as not only an inevitable process but a largely positive one. For some, large-scale agriculture development is seen as a desirable form of socioeconomic development complementing the historical agricultural activities in rural areas. These proponents argue that industrialization is more efficient and increases consumer choice. It also means greater consistency of product quality and a more profitable farm economy for those farmers remaining.

Others view this kind of agricultural development as an illegitimate model of development with the negative impacts outweighing the benefits, especially for communities. Citizens' concern about animal, especially dairy, industrialization revolves around concerns for the physical environment such as air and water quality, lack of governmental regulations, and concern for local community quality of life and animal welfare. Some scholars observed that arguments against the changing structure of agriculture are based primarily on a fear of change and a desire to cling to traditional ways of farming. This is a cultural view that the ideal farm should resemble a Fisher Price toy set and not a factory.

Social scientists have a long history of concern with the effect of industrialized farming on communities, but little research evidence is available on the risks it poses to communities. Recent analysis of existing studies finds some detrimental impacts to communities. However, we may be moving past the point of speaking of agricultural communities and increasingly need to discuss the question of how agriculture fits into our rural communities and countryside. As a result, it may be increasingly necessary to recognize that agriculture is one of many functions that that landscape can serve (other examples include residential and recreational), and we may need to reconsider policies and community processes so that they are seeking to find compatibility among these diverse uses.

Frank Fear

Senior Associate Dean

College of Agriculture and Natural Resources

Michigan State University

As senior associate dean, Dr. Fear serves the CANR as a leader in the continuing integration of programs in communities, agriculture and natural resources. He represents the dean in a variety of functions and serves as acting dean in his absence. He also provides oversight to the CANR general fund budget and programs and works in collaboration and coordination with the Michigan Agricultural Experiment Station in areas of research and MSU Extension in outreach activities. He is responsible for facilitating efficient and effective connections between CANR units and the dean's office, and he works with selected units on strategic planning and organizational development. He is also responsible for the vision and direction of global programs in the CANR, the MAES and MSUE, and he is responsible for ensuring the integration of global objectives into the fabric of CANR.

Dr. Fear has been a member of the MSU faculty for more than 25 years, serving in a variety of academic and administrative roles, most recently as a professor in the Department of Community, Agriculture, Recreation and Resource Studies. He served as chairperson of the Department of Resource Development (1989-95); as acting associate director of MSUE (1995-96); and as the inaugural chair of the Liberty Hyde Bailey Scholars program (1997-2000). He continues his involvement in undergraduate education through the Bailey program; is actively involved in graduate education through teaching and thesis/dissertation advisement; and recently completed terms as president of the Greater Lansing Food Bank and a consultant in the Food and Society program for the W.K. Kellogg Foundation. He is lead author of the recently published book *Coming to Critical Engagement* and is the senior fellow in Outreach and Engagement at MSU. Dr. Fear has been widely honored for his commitment to teaching, outreach and research excellence.

Dr. Fear has a bachelor's degree in sociology from St. John Fisher College, a master's from West Virginia University in sociology and a doctorate from Iowa State University in sociology.

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