USDA United States Department of Agriculture | National Institute of Food and Agriculture

# A Human Behavioral Approach to Reducing the Impact of Livestock Pest or Disease Incursions of Socioeconomic Importance: An Animal Disease Biosecurity Coordinated Agricultural Project (ADB-CAP)

# A Message from the Project Director

One of the speakers at the recent National Institute for Animal Agriculture conference reminded the audience that this year marks the 15th anniversary of both the 9-11 attacks in the United States and the horrific outbreak of foot-and-mouth disease in the United Kingdom. One was an act of terrorism; one was a terrifying consequence of an accidental introduction. Members of the food and agriculture sector are sometimes reluctant to think of themselves as "critical infrastructure" as defined by the Department of Homeland Security. However, I think they do consider themselves essential elements of the nation's economy and way of life. As one of those essential elements, the food and agriculture sector *is* a critical infrastructure and underlies the nation's food security. Indeed, every producer can be looked at as critical infrastructure given the interconnected nature of the food and agriculture sector. Without the production and availability of foods, efforts to ensure access and utilization across demographics are futile.

Food producing animals are vulnerable to a number of diseases and pests, some of which don't currently exist in this country, some that mimic diseases that occur elsewhere, and some that routinely circulate with varying levels of ease. In spite of daily challenges that override the consideration of disease and pest threats, producers and ranchers need to be aware of these threats—be they intentionally or accidentally introduced—and their potential consequences. The poultry and egg industries in 2015 were the target of the largest animal health event in US history due to highly pathogenic avian influenza (HPAI) and its eradication. The pork production industries have been dealing with emerging and re-emerging diseases, porcine epidemic diarrhea virus and Seneca Valley virus, respectively. Bovine viral diarrhea virus continues to circulate in beef and dairy cattle. In each of these cases, biosecurity is an important tool for stopping the spread of disease.

As more than one speaker at the National Institute for Animal Agriculture conference noted, biosecurity can be expensive and inconvenient. In fact, if it isn't inconvenient (for the disease-causing agent or pest) it won't be effective. But who should bear the costs? Glynn Tonsor, a collaborator on this grant project, outlined the role of trade-offs and incentives in biosecurity decision-making. (Listen to his remarks at https://m.youtube.com/watch?v=jjwodoKnsml.) This project will continue to take an inter-disciplinary approach to understanding what drives decision-making and the implications of the pattern of uptake of protective actions. Along the way we will engage stakeholders in assessing the trade-offs and incentives that impinge on the food and agriculture sector's ability to eliminate diseases or pests, to protect food animal production industries from new introductions, and to mitigate the consequences of such introductions.

This newsletter highlights some project activities of the past year. We welcome your input and participation as we proceed.

Julie Smith, DVM, PhD

## In This Issue

# Welcome New Team Members!

### Susan Mogenberg

Susan manages the projects in the SEGS lab, running the games and providing support to the faculty involved. Susan has a PhD in ecology and also teaches courses on Tropical Forest Ecology and Nontimber Forest Products. Her previous research ranged from sustainable harvest of non-timber forest products such as wild mushrooms and medicinal plants, to tropical plant-animal interactions, and migratory songbird nesting ecology.

### Morgan Getchell

Morgan is a recent graduate of the University of Kentucky where she earned her PhD in communication, and she will begin her post as assistant professor of communication at Morehead State University this fall. Her research focuses on risk and crisis communication, and she has worked on funded projects through the Department of Homeland Security and the United States Geologic Survey. Her dissertation research focused on the West Virginia water contamination crisis of 2014, but she has also studied foodborne illness outbreaks, natural disasters, and disease pandemics. She is working with Dr. Tim Sellnow to investigate the risk communication aspects of this project.

### Qianrong Wu

Qianrong is a graduate student in the Department of Economics at Iowa State University. She came to the United States from China in 2011 and obtained a B.S. in Mathematics at Iowa State University in 2013. Her research interests include agricultural economics, experimental economics, marketing, and international trade. She believes that there are great opportunities in agricultural business between the United States and China. She is currently working with Dr. Lee Schulz to investigate behavioral economics related to biosecurity in the hog industry.

# We Are Working on Our Image


Two undergraduates at the University of Central Florida, Chelsea Chen and Alexandra Decespedes, are working under the supervision of Dr. Tim Sellnow on branding our project. To some people, a brand is a mark on the hide of a horse or cow; to others, it is a logo. To us, it is a way to convey the essence of our project. This gets tricky when dealing with something as indistinct as biosecurity in the context of more than one animal industry. The students are working on identifying images and phrases that convey what the project is about in a positive way. University of Central Florida graduate student Paige Moorhead attended the National Institute for Animal Agriculture conference in April to gather input on the initial set of images and catch phrases from over a dozen stakeholders in attendance. The branding effort is intended to develop a “look” that transcends species and regional differences, but can also be tailored to the specific stakeholders of an output. In the meantime, you can check out the first issue of the project newsletter with an extensive project description and list of objectives at [http://blog.uvm.edu/jmsmith/smith-leads-usda-nifa-cap-protecting-animal-health/](http://blog.uvm.edu/jmsmith/smith-leads-usda-nifa-cap-protecting-animal-health/)

# Talking up the Project and the Topic of Animal Health Protection

We've been busy! Several team members have already presented on the work they've done on this project. The following presentations have been made by project collaborators or with reference to project products:


- Smith, J. The complexity of saving your bacon: the policy and human behavioral challenges of protecting food animal health. Research Summaries Session, US Animal Health Association. October 26, 2015, Providence, RI.
- Schulz, L.L. "Hog-Pork Market Update and the Economic Impact of PEDV." Presentation to North Japan Feed Association. Ames, IA. November 4, 2015.
- Harry Snelson, Director of Communications - American Association of Swine Veterinarians, requested, cited and acknowledged results from Schulz and Tonsor (JAS) paper on economic impacts of Porcine Epidemic Diarrhea virus in the United States in a conference presentation in Parma, Italy.

Initial results from the case studies completed have been presented to the FDA, Joint Institute for Food Safety and Applied Nutrition (JIFSAN), and the attendees of the International Crisis and Risk Communication Conference (ICRC). Details of the three presentations follow. The presentations to FDA and JIFSAN refer in detail to the ADB-CAP project to describe the application of risk and crisis communication to food and agriculture. The presentation to ICRC focused entirely on the ADB-CAP case study.

- Sellnow, T. L. Comprehending the role of message convergence for consistently effective message design in pre-crisis situations. Food and Drug Administration Meeting for the Risk Communication Advisory Committee, February 17, 2016, Silver Spring, MD.
- Getchell, M. C., & Sellnow, T. L. Porcine Epidemic Diarrhea Virus (PEDV). ICRC, March 5, 2016, Orlando, FL.
- Sellnow, T. L. Crisis communication overview. JIFSAN 2016 Annual Symposium, April 4, 2016, Greenbelt, MD.

Seminars explaining the value of data gathered using experimental games with examples specifically geared towards understanding the human behavioral approaches to reducing the impact of livestock pest or disease incursions of socio-economic importance were presented to members of the University of Vermont community and general public and members of the Experimental Program to Stimulate Competitive Research program, Research on Adaptation to Climate Change.

- Merrill, S. C. (2016) Experimental gaming research: the next step in data gathering and complex systems analysis. Research on Adaptation to Climate Change Retreat. Burlington, VT.
- Merrill, S. C. (2016) Experimental Gaming Research, gathering data to understand Social-Ecological Systems. Plant and Soil Science Departmental Seminar. Burlington, VT.

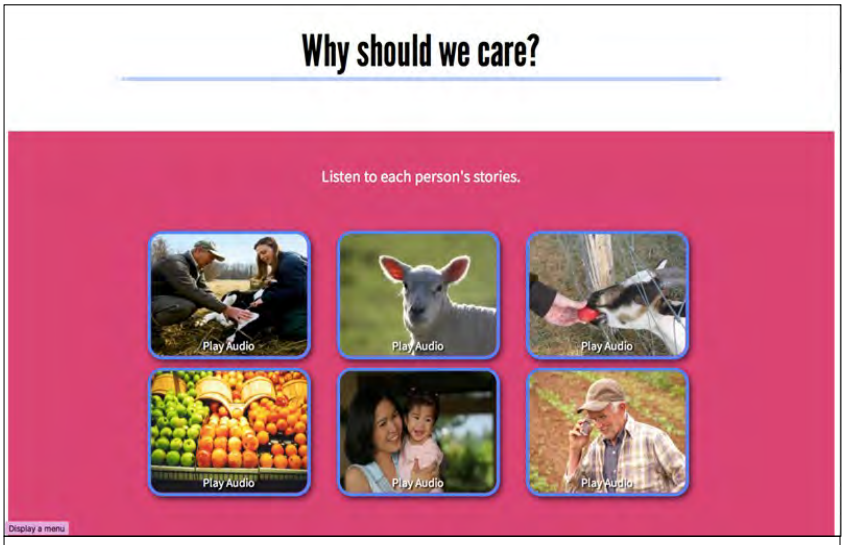
Dr. Susan Kerr moderated an Extension Disaster Education Network (EDEN) webinar called "Fair Biosecurity Checklists and Approved Protocols" on April 12, 2016. Presenters were Dr. Dale Moore (Washington State University Extension Veterinarian) and Scott Cotton (University of Wyoming Area Extension Educator). Forty-three participants from throughout the U.S. participated in the live webinar. This EDEN event was recorded and is archived at https://learn.extension.org/events/2443. Also, Drs. Susan Kerr and Amber Itle (Washington State Department of Agriculture) piloted some biosecurity project activities with a group of Whatcom Co. (Washington) 4-Hers in Lynden, WA, on April 12, 2016.

Dr. Glynn Tonsor gave a presentation to the National Institute for Animal Agriculture. While the economic impact of adverse animal health and disease events is well recognized, there is comparatively much less understanding of how decision makers throughout the livestock-meat supply chain assess the economic viability of available biosecurity options. To improve the overall animal health situation of the livestock-meat supply chain and enhance the efficiency of public and private investments, it is critical to understand the incentives surrounding potential implementation of available biosecurity options. The goal of this NIAA presentation was to overview these bio-security implementation incentives, to characterize how diverse situations throughout the supply chain lead to varied adoption rates, and to highlight key remaining economic knowledge gaps worthy of additional research and understanding.

# From the Educational Team: Biosecurity Begins at Home

The overall objective of the Education and Outreach component of the ADB-CAP project is to develop educational materials and methods that lead to measurable changes in attitudes and behaviors at critical control points in cattle, swine, and small ruminant production systems. The goals of the online educational pieces are twofold: 1) first and foremost, to raise awareness and make the stakeholder care about biosecurity; and 2) once they care and are ready to learn, to teach biosecurity concepts and protocols.

We are focusing primarily on the creation of web-based educational products because they provide a consistent message to a wide audience, any-time, anywhere. With computer-based delivery we can create learner-focused, interactive, and case- and research-based experiential learning materials. We are creating a toolbox of small, discrete basic modules, called learning objects, that can be reused and repurposed for use with different audiences, based on the social dimen-sional research in our ADB-CAP project and the resulting profiles identified for our stakeholders. By incorporating and customizing these basic learning objects we can tailor the approach, perspectives, and levels of the educational products to highlight local community strengths and interests, incorporate the specifics of the particular disease we are addressing, and match the perspectives of teachers and learners, making it easier to work with diverse populations.



What is "Biosecurity" and why should we care?

One method that has been shown to be effective in changing attitudes and behaviors is to educate youth who then share and strengthen the messages at home. Also, our literature review identified a need for biosecurity training modules for 4-H youth and leaders. Therefore, 4-H youth education has been identified as a priority for this project.

Our design working group (consisting of Drs. Susan Kerr from Washington State University Extension, Jeanne Rankin of Montana State University Extension, and Jeannette McDonald, designer and team leader from TLCProjects) has been meeting frequently to identify and create basic modules on biosecurity for 4-H youth, grades 3-12. Our first learning object, "What is Biosecurity and Why Should I Care" is in final development and will soon be sent out for peer review, followed by pilot testing with a range of 4-H youth.

We are excited about our first product. Anyone interested in participating in either the peer review process and/or pilot testing please contact Jeannette McDonald at mcdonal7@wisc.edu. We are also interested in collaborating and sharing resources with other projects.

## Collaborating Institutions

**Our team is comprised of people from many great universities and organizations!**

The University of Vermont
Montana State University
technology for learning center
University of Central Florida
Washington State University
Kansas State University
Iowa State University
USDA

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