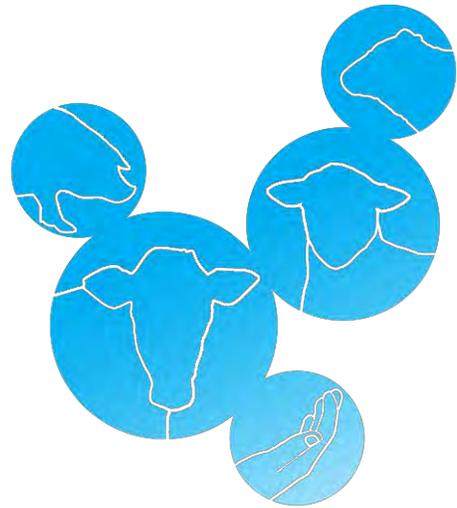


PROTECTING HERD HEALTH

An Animal Disease Biosecurity Coordinated Agricultural Project



Highlights of ADBCAP November 2016 Team Meeting from the PD's Perspective

Dr. Julie Smith, DVM, PhD



Friendly. Fun. Focused. For me, these words sum up the recent meeting in Mankato. New members were welcomed. Relationships were strengthened. We

laughed. We learned. We looked ahead.

The stated goals for the meeting were to accomplish the following:

- Assess our progress
- Touch base on collaboration
- Plan integration of cultural groups
- Link activities to outcomes
- Commit to next steps

To assess our progress, we held a “poster” session based on selected objectives. This brought us up to speed on (Obj 5) the progress of the development of learning objects (Jeannette, Jeanne, Susan K, and Julie), (Obj 3c) the application of IDEA (Internalization, Distribution, Explanation, and Action) and TSCT (Tensions of Strategic Communications Theory) to the swine industry response to porcine epidemic diarrhea (Tim, Robert, and Jason), (Obj 1a) the need to critically evaluate stakeholders and leverage points (Julie), (Obj 1, 1c) how messaging (exemplification) will be incorporated into serious games (Tim, Jason, and Scott), (Obj 2) how surveys are proceeding (Lee and Glynn), and (Obj 4) how agent-based models, protocol games, and compliance games are being used to understand behavioral impacts on the system and their potential as educational tools. A highly successful focus group workshop held on the last

day of our team meeting yielded valuable feedback on the simulation models and games.

To prime the pump for collaborative conversations, we held a jargon busting forum. We gained greater awareness of the pitfalls of jargon – and the opportunities at hand when we all have a better sense of what a “Nash equilibrium” or “critical control point” means in the context of our grant.

To address our project goal of integrating cultural groups into our activities, we discussed the potential of working with Hutterite farmers, Standing Rock cattlemen, and others. Because beef cattle issues are not currently the focus of the grant, it does not make sense to integrate the American Indians of Standing Rock. Hutterites (a branch of Anabaptists with similar roots as the Amish and Mennonites) have colonies in Canada (primarily Alberta, Manitoba, Saskatchewan) and northern plains states of the United States (primarily South Dakota and Montana).

Continued on next page



(left to right, seated) Robert Littlefield, Scott Merrill, Jeannette McDonald; (standing, middle row) Gabriela Bucini, Rebecca Sero, Susan Moegenburg, Jeanne Rankin, Linden Higgins, Lee Schulz, Eric Clark; (standing, back row) Chris Koliba, Glynn Tonsor, Julie Smith, Susan Kerr

In Montana the Hutterites produce close to 100% of the eggs in the state. Hutterites also run dairy farms, hog farms, and some beef and small ruminant operations. Although technology and computers are used in their businesses, the nature of their community may result in a difference in how messages are received, how economic incentives are prioritized, and how educational tools are used. A plan for distributing a survey developed by the economic team to Montana Pork Producers (Hutterite and non-Hutterite) was discussed and will move ahead.

Also, attention will be paid to women agriculturalists in all project activities as important gender-related results may be found. In discussing the linkage of our activities with outcomes, we clearly are working towards impacts

(in the sense of influential outputs and forces exerted by new data, interpretations, modeling platforms, and so forth) on message development, policy recommendations, and changes in behavior (or intention) in the issue space of protecting livestock health from new, emerging, or foreign animal diseases.

I find it extremely rewarding to work with such high-caliber, highly motivated, outcome-oriented teammates. Their willingness to question, to share, to explore, and to create something bigger together than any one or few of us could do is admirable. I look forward to sharing what we have accomplished and welcome your questions and suggestions at any time.

Live well and biosecurely!

Julie

Snapshots from Mankato



Team members and focus group participants playing the game



Scott Merrill getting feedback on "compliance" game



Gabriela Bucini explaining how agent-based model underlying simulations works

Risk Communication Team Tests Exemplification Effects with Computer Game

The risk communication team, in collaboration with the SEGS team, is preparing to conduct an experiment in risk decision making that combines strategic communication and computer game results. Specifically, the experiment will explore the impact that exemplification has on the choices people make while playing the risk decision making game described on the next page.

Exemplification theory posits that phrases or photos that are emotionally arousing are easily remembered and retrieved. Journalists frequently use exemplars to gain readership and viewership for the stories they create. These compelling phrases or photos have been shown in previous research to influence "compliance." This experiment explores the potential influence of exemplification on the risk decisions people

make while playing the PEDv game. "I've seen previous work studying exemplification and risk communication, but I've never seen the impact of exemplification measured in a game-playing context. This is truly groundbreaking research," said Dr. Timothy Sellnow, one of the project's leaders.

Ultimately, this line of research seeks to determine the impact of news stories that include exemplification on people's decision making process. To ensure a broad sample of players, data from the gaming experiment will be collected in Vermont, Florida, Kentucky, and Missouri. We are pleased that three new researchers will be joining the grant for this project: Dr. Morgan Getchell, Morehead State University, Dr. Jason Martin, University of Missouri-Kansas City, and Patric Spence, University of Kentucky.

SEGS Lab Makes Games and Simulation Model

Convenes First of Many Workshops

The use of gaming and simulation results and scenarios to impact policy and operations on livestock premises is a central goal of the ADB-CAP project. To better understand how human behavior and industry structure impact the spread of livestock disease and adoption of biosecurity measures on premises, the Social Ecological Gaming and Simulation (SEGS) Lab at the University of Vermont has developed two “serious” games and a simulation of the swine industry in three states.

A “serious” game is designed for a primary purpose other than pure entertainment. The “serious” adjective refers to gaming experiments used by industries, educational and research institutions, and by health care, emergency management, city planning, and engineering professionals to understand how human behavior is shaped by incentives, environmental factors, and underlying values. For the ADB-CAP project, two games pertaining to the spread of disease in swine production facilities have been developed. A “protocol” game looks at the role of information regarding levels of biosecurity threats and biosecurity practices in a producer’s willingness to invest in biosecurity measures. A “compliance” game looks at the role that incentives, time constraints and biosecurity messaging play in bringing about greater compliance with biosecurity measures. To date, these games have been played by college students and a handful of swine industry experts.

A computer simulation is a computational model that reproduces the behavior of a system. In our case, we model the swine industry in three states: North Carolina, Iowa and Illinois. Swine producers, feed mills, auction houses and slaughter plants are spatially distributed across the landscape. The swine disease, PEDv, which is spread

through contaminated manure, body fluids and feed, can spread throughout the industry network. Specific nodes in the network are given the ability to adopt biosecurity measures. Scenarios can be run looking at the relationship between levels of biosecurity adoption and disease transmission. A wide variety of “what if” scenarios may be run

to anticipate how the swine production system in these regions will be impacted.

In addition to running experiments and publishing these results in peer review journals, the SEGS team is working with other ADB-CAP collaborators, including industry experts, to design treatments for games, calibrate the simulation model, and consider the implications of these results for policy makers, veterinarians, industry

leaders and farm level producers.

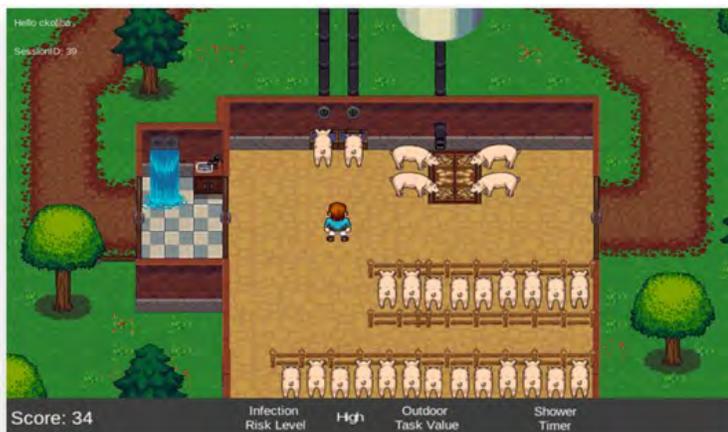
To capture the thinking of industry experts the SEGS team is staging a series of workshops designed to introduce these experts to the games and simulation, allow them to play one or both of the games, understand the underlying assumptions of the games and simulation,

and consider the policy and operational implications of the results. To date, two such workshops have been convened with experts in MN and the Washington DC area. More workshops are planned.

The preliminary results from these workshops have been very promising. We have heard from some initially skeptical experts who humorously told their colleagues that they were going to “play games for the day,” come out of the workshop with a deeper appreciation of the complexity of their industry and the ability of our innovative games and models to help them better understand the roles that human behavior and industry structures play in keeping our nation’s livestock supply healthy.



Screen shots from the “compliance” game.



Survey of Industry Experts Reveals Views on Effectiveness and Feasibility of Current Biosecurity Measures

Understanding disease transmission routes and implications for biosecurity is critical to mitigating livestock disease outbreaks and maintaining efficient and profitable production. The goal of biosecurity is to eliminate pathogen exposure and minimize endemic pathogen impact. The focus of this study was to evaluate biosecurity practices currently recommended against endemic diseases for their role in protecting against new, emerging, and foreign diseases. The specific objectives were two-fold: first, to identify expert views on the effectiveness (i.e., the extent of risk reduction), feasibility (i.e., the practicality of affordable implementation), and current implementation (or adoption) of biosecurity measures applicable to specific disease transmission risks (termed routes in this paper); and second, to identify expert views on the effectiveness, feasibility, and implementation of a set of specific biosecurity measures. We targeted livestock industry experts such as veterinarians, epidemiologists, animal scientists, and economists for an initial survey exploring the effectiveness, feasibility, and implementation of biosecurity measures in the swine, beef cattle, and dairy industries.



Biosecurity targeting direct animal-to-animal contact, semen, people, and vehicles and other fomites were ranked most effective and feasible across industries. Airborne and arthropod transmission were ranked least effective and feasible across industries. The swine industry had higher estimated implementation of biosecurity against most disease transmission routes. All-in and all-out production had the highest estimated implementation in the swine industry. In the beef cattle industry, performing daily observations by producer/employees had the highest estimated implementation. Reduced environmental viral load through pathogen reduction had the lowest estimated implementation in the swine and beef cattle industries. In the dairy industry, monitoring production records for health status changes had the highest estimated implementation, and line of separation in place for all employees entering premises had the lowest. Swine experts considered separation line for all animals entering/leaving premises and reduced environmental viral load through pathogen reduction the most and least effective and feasible, respectively. Stabilization and monitoring for affected premises and daily observations by producer/employees were identified as most effective and feasible by beef cattle and dairy experts, respectively. All-in and all-out production was rated least effective and feasible by both beef cattle and dairy experts.

With this information, a targeted set of disease transmission routes and biosecurity measures can be examined in a more in-depth and refined study. Prioritization of the most effective and feasible biosecurity measures will ensure resources are applied where biosecurity advances are of the highest importance and that will offer the greatest return on investment.

Collaborating Institutions

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



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