

Knowledgeable, Ready, Able

A Comprehensive Extension Agro-security Information Program for the Livestock & Poultry Industries

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Emerging, Critical, or Dynamic National Agro-security Priorities in Extension

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Scope of Problem

During the past decade the poultry and livestock industries¹ have experienced many mass mortality incidents worldwide. In North America alone, mass animal losses have been caused by hurricanes (Katrina, 2005; Rita, 2005); rangeland wild fires (North Texas, 2006); blizzards (Kansas, Colorado, 2007); prolonged heat stress (California, 2006), flooding (Midwest, 2009); Exotic Newcastle Disease incursion (California, 2001) and avian influenza outbreaks (Alberta, 2004; Virginia, 2002; Maryland, Delaware, 2002). Furthermore, untold numbers of producers and their insurers have been impacted by local fires, ventilation system failures, building collapse, and disease, resulting in animal loss.

Responding to industry-wide concern regarding the frequency and impact of catastrophic animal losses, the U.S. Animal Health Association issued a resolution in 2009 calling for expanded research and emergency management programs to address “knowledge and capability gaps related to mass animal mortality management” (USAHA, 2009). This call was seconded by a comprehensive review (Gilpen et al., 2009) of more than 2,000 emergency response articles published during the period 1965-2007 that identified significant gaps in educational and training materials pertaining to agricultural emergencies and called for development and delivery of agriculture-specific information for first responders, livestock producers, importers, shippers, international travelers, and the general public.

Program Mission/Vision

This paper proposes to fill knowledge and capability agro-security² gaps in the U.S. animal industries through a coordinated multi-component USDA/Extension program designed to:

1. Educate producers, industry suppliers, and service providers about pre-event identification and reduction of livestock emergency risk factors;
2. Improve emergency decision-making and response through development of emergency response databases and electronic information networking; and
3. Stimulate research needed to fill knowledge gaps identified by national and local livestock industry groups and emergency responders.

Recognizing that several federal agencies (USDA-APHIS, DHS, DOJ, CDC, and FEMA) are authorized to coordinate responses to emergencies that are national or regional in scale, the proposed Extension program focuses on strengthening the resiliency of the livestock industry at the local level and providing for meaningful actions prior to agency involvement. The goal is to enhance local emergency response capacity to handle events that are too small to justify federal or state agency involvement; and provide local support to federal/state agencies during large-scale events. The local focus is in concert with post-9/11 emergency response literature recognizing the benefits of strengthening local resiliency (Waugh, 2003; Waugh/ Streib, 2006; National Research Council, 2011; Boteler, 2007) and supports the emergency response philosophy stated by Homeland Security Secretary Napolitano in her address to the American Red Cross: “... *Building a resilient nation doesn't come from a top-down, government-only, command-and-control approach; it comes from a bottom-up approach; it comes from Americans connecting, collaborating; it comes from asking questions and finding new solutions.*” (National Research Council, 2011).

¹ In this paper the term “livestock industry” refers collectively to cattle, swine, sheep, goats, poultry, aquaculture, and all other types of intensive food animal production.

² In this paper the term “agro-security” refers to the subset of agricultural security issues pertaining to animal agriculture.

Program Components and Outcomes

Education

Research indicates a gap between national biosecurity recommendations and on-farm adoption (Moore et al., 2008). Improving local emergency preparedness requires increased awareness and understanding of agro-security risks and adoption of preventive practices. The educational component will improve understanding and adoption through delivery of species-, location-, and production/management-specific agro-security information to all levels of the livestock production chain. To initiate long-term changes in social attitudes, a 4-H and FFA education component also is recommended.

The framework for the education component will be agro-security demonstration pilot programs (3-year duration, involving 5-20 counties) located in five livestock-intensive areas (site selection based on responses to a national Extension RFA). Local program development and evaluation will be guided by a coordinating committee for each pilot program.

To control program costs, information delivery will initially be through quarterly newsletters emailed to program subscribers and selected media outlets (program subscribers without email service will be accommodated via limited printing of paper copy). Each newsletter will contain content generated by Extension specialists and local experts (e.g. state/local emergency management/regulatory agencies, livestock producers, veterinarians, program subscribers).

Programming also will be supported through development of content at the national program level focusing on issues of industry-wide importance (e.g. maintaining business continuity during disease outbreaks, on-farm agro-security risk assessment, animal disease traceability). Planning of this material will be guided by a national coordinating committee with representatives from USDA/Extension, DHS, and USAHA and its member associations. The content will be generated by knowledgeable people representing livestock-related professional organizations and will include selected content presented at relevant national conferences such as the *International Symposia on Livestock Mortality Disposal* (sponsored by USDA-APHIS in 2004, 2006, 2009, and by DHS in 2012).

Specific outcomes for the education component will include:

- Development of five Extension/Livestock-industry agro-security working groups (coordinating committees) in geographically different regions of the U.S.
- Development of 10 or more agro-security education products (e.g. bulletins, PowerPoint presentations, species-specific risk assessment tools) annually. Ideas will be solicited from subscribers and coordinating committees in each demonstration area. Review at the national level will encourage coverage of national- as well as local-level threats; help to ensure consistent formatting; and reduce duplication of effort. Products will be posted on project-specific pages of the EDEN website (to maintain local project identity) and their distribution promoted through selected media outlets, state/federal agency contacts, and partnering universities.
- A scholarly-paper characterizing: threats to the livestock industry; perceptions of risk in the industry; industry preferences for mortality-related information and delivery methods;

successes/failures for each pilot demonstration; and recommendations for future Extension agro-security programming.

Local Emergency Capacity Assessment & Networking

Local agro-emergency response decisions are often made hurriedly by individual producers armed with outdated or incomplete information. This can lead to decisions that fail to consider available options. A common example is the knee-jerk reaction to use on-farm mass burial following catastrophic livestock loss, a decision increasingly viewed unfavorably by the public.

The local capacity assessment and networking program component will provide subscribers in each demonstration area with rapid access to a real-time web-based decision-support database including available capacity and current fees at: local rendering plants; landfills; trucking firms; excavating contractors; co-compost suppliers and processors; emergency incineration services; and ag equipment and materials vendors. In the event of a livestock emergency, a producer could contact the local extension office to request decision support and, with a few keystrokes, the database will be used to simultaneously poll all available contractors (within a specified service radius). Combined with on-line general information on regulatory limitations and the practical pros and cons of different disposal options, this information will help to insure that all feasible options are considered, and that safe and economical options are identified. This will help to insure business continuity of livestock operations and reduce the costs of insurance coverage for disposal and clean-up of catastrophic livestock losses.

Since emergencies occur infrequently the public tends to lose interest in emergency planning. Similarly, producers and services and supply providers may lose interest in a database focusing solely on emergencies. To counteract this, the online database must include content having every-day utility for both parties. For producers this can include the agro-security education products from the education component, as well as supplemental planning and hazard avoidance information on topics such as on fire and snow load control, feed storage, animal nutrition, and managing meat and milk products rejected by the packer/buyer. For suppliers, this can include information on what livestock producers value and look for when they purchase materials and services, as well as the opportunity to advertise non-emergency services (veterinary, nutrition consulting, engineering, etc.) available within the demonstration project area (a local electronic yellow-pages for the livestock industry).

With low-tech implementation, decision support requests and responses can be accomplished with simple email lists. In a more sophisticated and less labor intensive implementation, selected service providers would be asked to post available emergency capacity and estimated service fees via an on-line web-based form that feeds data into an on-line spreadsheet (essentially Google forms linked to a spreadsheet) made viewable only to the producer requesting assistance. In a high-tech and more expensive implementation, polling of selected classes of emergency service providers, and notification of key agency personnel (at producer's request) could be done via a cellular phone app or commercial mass notification services—such as Blackboard Connect (universities now use such services to notify faculty and students of emergency situations)—thereby facilitating simultaneous polling and notification via both email and cell-phone text messaging.

Extension's working relationships with local agriculture, businesses, and government position it to educate the public about the emergency database/ networking system and to contact local businesses and agencies to offer them the opportunity to post their services to the online database using a simple online form. Database maintenance will be accomplished at relatively low cost by emailing project cooperators annually and asking them to spend a few minutes to check and update their data. Firms that fail to update their data would be dropped from the database.

Specific outcomes for the local capacity assessment and networking component will include:

- Establishment and testing of five local capacity databases and emergency information networks.
- Documentation of successes/failures of capacity assessment and emergency networking approaches used in each demonstration area.
- A white-paper comparing local capacity/networking methods with alternative technology options, and recommendations for selecting and using technology to strengthen emergency preparedness in the livestock industry.

Research

In 2005 the National Science and Technology Council identified six areas for sustained Federal investment in science to reduce the impacts of disasters. The livestock industry needs a similar roadmap that delineates the "knowledge and capability gaps" alluded to in the 2009 USAHA resolution. The following are example categories and researchable questions provide a world of opportunity for Extension researchers in many disciplines, and the proposed Extension demonstration programs will provide five "living laboratories" where applied research can be conducted and new ideas tested.

1. **Agro-security information & communication:** *What key factors influence risk perception and meaningful response in the livestock industry? How can this knowledge be used to strengthen agro-security education?*
2. **Vulnerability assessment and reduction:** *What are the top priority vulnerabilities associated with specific: species; production management systems; geographic regions; or segments of animal production chains? How are diseases transmitted and propagated, and what are the strategic prevention and control points? How can monitoring and data sharing strategies prevent or mitigate livestock emergencies? Can indicators like those discussed by Cutter et al. (2010) be used to benchmark and improve livestock industry emergency preparedness?*
3. **Emergency response:** *What new or improved technologies can reduce the capability gaps in mass animal mortality management? Monitoring techniques to address ongoing concerns among livestock health officials regarding residual pathogen levels in composted animal tissues and manure. Are the proposed the local emergency capacity database and electronic networking concepts sustainable, how effective are they, and how can they be improved?*

Specific outcomes of the research component will be:

- Identification and description of the top ten animal industry priorities for agro-security research.
- Evaluation of the effectiveness of the agro-security database and electronic networking concepts in each of the five demonstration areas.

- Evaluation of five carcass management technologies for their efficacy in reducing the vulnerability of interdependent critical infrastructure during a livestock crisis.
- Assessment of potential usefulness of local agro-security emergency network in collecting data for a national Historic Incidents Database and Archive as recommended by the National Agricultural Biosecurity Center Consortium (2004) for the purpose of assessing “lessons learned” and developing improved future emergency response protocols.

Contribution to Extension

The proposed program provides Extension with opportunities to deliver leadership in local agro-security emergency preparedness. The outcomes of the educational and networking components will provide Extension professionals with new educational materials and decision aids in support of livestock industry programs, and will expand the library of EDEN disaster response materials. The research component facilitates identification and prioritization of livestock industry agro-security research needs for consideration by researchers, federal grant managers, and policy makers. All of the proposed components support progress toward Global Food Security, one of the five NIFA priority areas.

Conclusion

The proposed program provides a substantive local and national response by USDA Extension to the 2009 resolution by the U.S. Animal Health Association calling for assistance in filling “knowledge and capability gaps” relevant to preventing, mitigating, and recovering from catastrophic animal losses. Extension has a trusted relationship with many farmers, regulators, and community leaders, positioning it to be a leader in developing livestock industry appreciation of and support for long-term local agro-security programs.

Literature Cited

- Boteler, F.E. 2007. Building Disaster-Resilient Families, Communities, and Businesses. *Journal of Extension*. v. 45 no. 6.
- Cutter, S. L., C.G. Burton, and C.T. Emrich. 2010. Disaster Resilience Indicators for Benchmarking Baseline Conditions. *Journal of Homeland Security and Emergency Management*: v. 7, no. 1, article 51. DOI: 10.2202/1547-7355.1732
- Gilpen, J.L., H. Carabin, J.L. Regens, and R.W. Burden. 2009. Agriculture Emergencies: A Primer for First Responders. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*. v.7, no 2. DOI: 10.1089=bsp.2008.0037
- Moore, D.A., M.L. Merryman, M.L. Hartman, and D.J. Klingborg. 2008. Comparison of Published Recommendations Regarding Biosecurity Practices for Various Production Animal Species and Classes. *JAVMA*. v. 233, no 2, pp 249-56.
- National Agricultural Biosecurity Center Consortium. 2004. Historical Documentation. Chapter 10 by James Ehrman and Jack Holl in *Carcass Disposal: A Comprehensive Review*. Kansas State University, Manhattan, KS.

National Research Council. 2011. *Building Community Disaster Resilience Through Private-Public Collaboration*. The National Academies Press. Washington, D.C.

National Science & Technology Council. Subcommittee on Disaster Reduction. 2005. *Grand Challenges for Disaster Reduction: A Report of the Subcommittee on Disaster Reduction*. Executive Office of the President. Office of Science & Technology Policy. Washington, D.C. www.sdr.gov/SDRGrandChallengesforDisasterReduction.pdf

USAHA. Committee on Animal Emergency Management. 2009. USAHA-2009 Resolution #2: Knowledge and Capability Gaps Related to Mass Animal Mortality Management. www.usaha.org/committees/resolutions/2009/resolution02-2009.pdf

Waugh, W.L. 2003. Terrorism, Homeland Security and the National Emergency Management Network. *Public Organization Review*. v. 3, pp 373-85.

Waugh, W.L. and G. Streib. 2006. Collaboration and Leadership for Effective Emergency Management. *Public Administration Review*. v. 66, pp 131-40.