

Symposium Accomplishments

**A Post-Symposium Documentation or Deliverable of the 5th International Symposium
on Managing Animal Mortality, Products, By-Products, and Associated Health Risk:
Connecting Research, Regulation, and Response**

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Introduction: Final Accomplishment Reporting

The 5th International Symposium on Managing Animal Mortalities, Products, By-Products and Associated Health Risk was held September 27 through October 1, 2015, in Lancaster, Pennsylvania. The goals of the Symposium were to strengthen collaboration, open the way for partnerships, stimulate research and educational activity, foster the development of strategies and standard operating procedures, and identify needs in research, outreach, policy and/or response. The final deliverable from the Symposium is this report about the ‘accomplishments by participants’ achieved within one year following the Symposium. It includes information about:

- Collaborations
- Education and Outreach
- Research
- Software and Patents
- Publications and Creative Works
- Governmental Testimonies and Consultation

In May and December of 2016, the 178 participants who attended the Symposium were invited to complete surveys (SurveyMonkey®) to help identify how this Symposium impacted their work in the year following the event. The same survey questions were asked both times (Appendix A). Participants were asked to share direct and indirect experiences they had been involved in as a result of their participation in the Symposium. In the second survey, participants were asked to submit only "new" information or information which added to an accomplishment reported in the previous survey. A total of 56 and 53 people responded to the first and second survey, respectively. People may have responded to one or to both surveys. Respondents answered quantitative questions once but may have provided more than one answer to qualitative questions which asked for descriptions. The compilation of survey responses here, included the movement of some answers by authors of this report, from the list of answers of the original question to the list of responses for another question where it was thought to be more apropos.

The goal for this final accomplishment report is that the Symposium would continue to impact the work of its participants and others. In reading the examples of accomplishments, new ideas would be obtained by readers for further work to be undertaken. Additional purposes in surveying and writing this Report are to give direction to the planning of future symposia and to convince potential sponsors of their value. Thank you to all of the 5th International Symposium participants who responded to these surveys.

Demographics

Participants responding to the surveys were from: Australia, Canada (Alberta, British Columbia, Ontario, and Quebec), Georgia, New Zealand, Nigeria, South Korea, Tunisia, the United Kingdom (Wales), the United States (Alabama, Colorado, Connecticut, Delaware, the District of Columbia, Florida, Georgia, Idaho, Indiana, Kansas, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Montana, Nebraska, New Jersey, New Mexico, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Texas, the Virgin Islands, Virginia, Washington, West Virginia, and Wisconsin), and Viet Nam (Ha Noi). The professional affiliation or type of employment of responding participants is shown in Table 1.

Table 1. Professional affiliation of survey respondents.

Professional affiliation	May survey respondents, number (%)	December survey respondents, number (%)
Educational institution	11 (20)	10 (19)
Government or public enterprise	36 (64)	30 (57)
Media	-	1 (2)
Non-governmental organization	2 (4)	3 (6)
Private sector	6 (11)	7 (13)
Research institution	1 (2)	2 (4)
TOTAL	56 (100)	53 (100)

Collaborations

Often the most important outcomes of attending an educational event such as the 5th International Symposium are collaborations; connecting and (or) working in the future with another attendee, or with someone who did not attend the Symposium, but was a referral or a connection obtained at the Symposium. Participants were asked to estimate the number of renewed collaborations and the number of new collaborations resulting from the Symposium (Table 2).

Table 2. Renewed and new collaborations resulting from attending the 5th International Symposium.

Collaborations	May survey respondents, number (%)	December survey respondents, number (%)
Renewed		
None	7 (13)	7 (13)
1 to 2	23 (42)	21 (40)
3 to 5	13 (24)	15 (28)
> 5	13 (24)	10 (19)
New		
None	15 (27)	13 (25)
1 to 2	25 (45)	24 (45)
3 to 5	11 (20)	10 (19)
> 5	13 (23)	6 (11)
TOTAL	55 (100)	53 (100)

Respondents were subsequently asked to describe the nature of these collaborations. For the May survey 43 people responded with a total of 52 descriptions, and for the December survey 46 people responded with a total of 59 descriptive answers. Descriptions of collaborations are summarized in the list below.

- Information sharing (both giving and receiving)
 - Highly Pathogenic Avian Influenza (HPAI) preparedness
 - Procedures for CO₂ euthanasia
 - Composting of avian influenza positive carcasses
 - Seeking answers regarding mortality composting
 - New and existing projects
 - Changes to government policy
 - Epidemiology, surveillance, information, prevent and control animal disease
 - Catastrophic large animal mortality composting
 - Gaining guidance & answering questions on protocols for avian flu composting

- practices
- Responding to disease outbreaks or to share information
- Sharing of lessons learned regarding past outbreaks
- Contacted government regulators for decontamination standards
- Requested further information from presenters and vendors at the Symposium
 - From electronic technology demonstrators
 - Purchased euthanasia device for large birds and received training from the manufacturer
 - Reached out to exhibitors for further information about their decontamination products
 - Vendor to vendor connections that developed into larger potential business proposals
- Sharing of information across state and national borders
- Assisting in development of standard operating procedures (SOP's) for international government agencies
- Sharing of resource documents and experiences to better address weaknesses in my own organization's ability to prepare and respond to exotic animal diseases
- Developing best management practices and videos for routine mortality composting
- Peer-review of various documents
- International exchange visits
- Prevention and control of zoonotic disease
- Disposal options for livestock
- Alternative equipment options for producers
- Public outreach on mortality composting
- Regulatory ongoing duties related to inspection/compliance
- Shared Emergency Management documents
- Shared Emergency Management training opportunities
- Deployment
 - Involvement in HPAI/Low Pathogenic Avian Influenza (LPAI) response in Indiana
 - Whole house euthanasia
 - Worked with department of agriculture on disposal of animal carcasses from a starvation situation
 - Worked with county sheriff on illegal dumping of cattle carcasses
 - Traveled to other state to help with agricultural natural disaster
 - Composting of diseased animal carcasses
 - Composting mortality from flooded farms
 - Review of disposal module developed with DHS
 - Participation in APHIS-VS Compost Group conference calls
 - Participation in work groups
 - Worked with two compost subject matter experts (SMEs) in a local training course, met with new contractor for possible future work, working with fellow employee more closely on disposal plans now
 - Extension assistance to producers.
 - Helping them understand and deal with routine mortality and plan for catastrophic
 - Research

- Conference calls for planning
 - Drafting proposals
 - Conducting research project
 - Supervision of graduate student
 - Finding program managers and investigators at other institutions doing parallel work
 - Critical review of data and assumptions for current research
 - Grant applications
- Planning
 - Consulting and planning for depopulation and disposal of carcasses in an animal health outbreak
 - Discussing HPAI emergency planning
 - Worked with other agency representatives to incorporate learned information into our HPAI preparedness plans
 - Discussed current disease status in another country
 - Discussions on planning for livestock disease events, creating protocols and processes for how we will handle a significant disease outbreak.
 - Disposal tools, disposal plan reviews
 - Emergency preparedness intentions, and well-being
 - Program and responsibility details

Education or Outreach

Survey respondents were asked to describe the expansion of an existing education or outreach program, the design and implementation of a new education or outreach program (including new courses and certificate or degree programs), the completion of a funding request or grant application for a new or existing educational or outreach program or a presentations to stakeholders (industry groups, communities, other organizations). The number of respondents indicating that an education or outreach effort had been undertaken or was being planned for as a result of their attendance at the Symposium is shown in Table 3.

Table 3. Number of respondents indicating an education or outreach effort resulted or was being planned because of attendance at the 5th International Symposium.

Aspect	May survey respondents, number (total for aspect, %)	December survey respondents, number (total for aspect, %)
Expansion of existing program	22 (27, 82)	17 (26, 65)
Design of new program	8 (21, 38)	6 (21, 29)
Completion of funding request for new or existing program	9 (19, 47)	8 (22, 36)
Presentations	31 (33, 94)	23 (30, 77)

The education and outreach efforts were described by survey respondents as:

- Expansion of an existing education or outreach program
 - Expanded content and instructors for three existing training programs with multiple sessions
 - Two national programs implemented and an international one to be implemented
 - Inclusion of lectures on animal by-products management within academic coursework

- Included experience of egg producer in dealing with avian influenza in my undergrad and graduate presentations at the veterinary school
 - Added greater detail and background information from Symposium into existing Extension programs
 - Photos taken on tours were valuable
 - Carbon source job aid
 - Collaborated with SME's and other government staff to create educational brochures, pamphlets for industry related to disposal
 - Discussed materials/equipment that should be immediately procured
 - Incorporated learned information into public outreach presentations
 - My increased knowledge of overseas research and response experience has provided for more authoritative advice to my current colleagues
 - Proper disposal of dead animals for farmers
 - Provided information to and assisted several agricultural producers on composting large animal mortality
 - Working on collaborative outreach to landfills for HPAI disposal
 - Planning to develop an education program to small farmers in my country about animals mortality management
 - Organized workshop on communication, plan of action, advocacy, training of trainer
 - Understanding the biosecurity benefits of properly using farm freezers for routine mortality recycling
 - Collaborated on poultry outbreak response training for international veterinarians on composting
 - Have used some photos taken on tours in presentations
 - After having viewed a commercial low cost vehicle disinfection system, I thought of ways to improve the system and lower the cost by entering into a cooperative agreement with a university senior engineering students
 - Collaborated with another attendee to provide outreach and education to poultry producers regarding a Mass Mortality Disposal Plan and ICS training opportunities
 - Added different species to an ongoing composting demonstration
 - Expanding on existing projects with an environmental engineering firm for the planning for potential mass animal burial
 - Planning next Symposium
 - Made efforts to identify an animals mortalities database
- Designed and/or implemented a new education or outreach program
 - Used information gained from the Symposium to develop new national workshops regarding foreign animal disease response
 - Proposed the addition of animal mortality management as a new course in Animal Science academic curriculum
 - USDA HPAI training program
 - Several attendees at the Symposium also attended the training program
 - On-farm livestock composting demonstration
 - Hosted a basic compost training course in March, 2016
 - Broad overview for federal, state, extension and industry responders
 - Included demonstration with compost piles
 - Long term strategies for animal diseases

- Worked with senior engineering students at the University of Delaware to design a low cost vehicle undercarriage wash system targeted to backyard farmers and small scale farmers
- Collaborate with CDC organized a workshop on economic losses caused by rabies and collaboration with OIE define the steps to eliminate rabies
- Completion of funding request for new or existing education or outreach program
 - New proposal regarding foreign animal disease response
 - Have accessed funds to increase government investment in infrastructure and assets relating to preparedness activities i.e., upgrading biosecurity facilities for a livestock standstill; better equipping staff (tools) for more effective disease response
 - USDA NRCS State RCPP grant to get farm freezers for routine mortality recycling
 - Expansion of state's veterinary stockpile
 - USDA APHIS Veterinary Services entered into a cooperative agreement with the University of Delaware department of engineering
 - Received funding to cover 50% of cost associated with pig euthanasia training
- Presentations to stakeholders (industry groups, communities, other organizations)
 - Numerous workshops and invited presentations regarding foreign animal disease response based on the presentation that I made at the Symposium
 - Present mortality composting material to producers and university students
 - Presentations to college community and at extension workshops on the role of composting in an HPAI outbreak
 - Presentations to government, farmers, other researchers
 - Presentations to one regional organization and one international organization
 - Webinar to EDEN
 - Three presentations which included new information learned at Symposium
 - Local public health officials and poultry farm owners
 - Biosecurity, PPE, and composting overview
 - Preparedness talks to members of the poultry industry in Indiana
 - HPAI outreach and training for producers, veterinarians, allied ag industry stakeholders, and general public
 - HPAI Planning - plan to discuss more regarding C&D activities
 - Presented for my institution and to members of my veterinarian association
 - Propose that our next congress focus on mortality management
 - Met with turkey farmers in the center of state to develop plans in the event of avian influenza
 - Multiple presentations to industry groups including Australian Pork Limited, university students and other Australian state jurisdictions
 - Presentations to: World Poultry Science Association - South Australia Branch (South Australian Poultry Industry), commercial composting companies, state government
 - Power point was constructed to summarize lessons pertinent to HPAI possibilities in New York
 - Presented conference overview to government laboratory group
 - State poultry disease task force meeting with neighboring state, HPAI response team, and a turkey-breeder company
 - Presentation to the francophone veterinary community on avian influenza response: Canadian mostly but also a few facts from the experience of the egg producer who

- spoke at the Symposium
- Presentation to the poultry industry about poultry depopulation
- Discussions with local conservation groups about mortality management on- and off-farm
- Several presentations on the benefits of farm freezers for routine mortality recycling
- Ten avian influenza presentations locally and nationally and two presentation regarding disposal
- Regional working group update about animal mortality options
- USEPA Decontamination Conference presentation on decontamination of vehicles to prevent progression of livestock disease
- Multiple presentations given to industry livestock farmers, union representatives and staff), and policy-makers (government and associated agencies)
- Agriculture Ministry
- Many presentations to a range of stakeholders about our carcass disposal preparedness activities and how they can be assisting animal industry organizations and the responsible agency
- Pennsylvania HPAI exercises and trainings for USDA/PDA employees
- Participated in APHIS HPAI Composting training with participants
- 2016 EPA International Decontamination Research and Development Conference
- Non-Conventional Threat CBRNe USA 2016
- APHIS Avian Health Field Training
- Ohio Poultry HPAI Preparedness Meeting
- Joint US Animal Health Association/American Association of Veterinary Laboratory Diagnosticians Committee on Animal Emergency Management
- NCD&CS/USDA-APHIS Disposal Unit – Compost Management Team
- US Poultry & Egg Association's 2015 Live Production and Welfare Seminar
- Poultry composting presentation to poultry industry in the tristate area
- Presentation to government and industry on the well-being of responders and farmers
- Presentation to pork producers on lessons learned from HPAI in poultry
- Presented to WI-DATCP on composting protocol and disposal to provide better understanding of carcass disposal procedures during a disease outbreak
- Composting Workshop, Tifton, GA
- Presentations on mortality composting to the new HPAI term hires within USDA-APHIS-VS during April 2016
 - Collaborated w/ Dr. Don Beckett, AD of CO Area
 - Based on my experiences in HPAI Mortality Composting, my training at U-Maine Compost School, and the Symposium
- Organized 23 workshops and media outreaches regarding rabies prevention to communities
- Advanced Composting Board meeting
- Leveraged several presentations to stakeholders, governmental, non-governmental, and industry stakeholders
- Webinar(s) on composting
- Developed SOPs and provided compost training and webinars
- Collaborated on poultry outbreak response training for international veterinarians on composting

- Emergency management exercises on catastrophic animal mortalities.
- HPAI exercises with multiple agency collaborators (poultry industry, state departments of agriculture in multiple states, USDA-APHIS-VS, academia, companies offering services for vehicle disinfection stations, euthanasia devices, manpower to assist with outbreak needs)
- Worked with a college beef and dairy production class
- Provided training to USDA-NRCS staff

Research

Expanding an existing research project, designing and implementing a new research project, or completing a funding request or grant application for a new or existing research project are all significant impacts that the Symposium may have had in part or in whole on the research work of those who attended the Symposium. Survey respondents were asked to respond to three questions about their research activities in the year following the Symposium. The number of respondents indicating that one or more of these research efforts had been undertaken as a result of their attendance at the Symposium is shown in Table 4.

Table 4. Number of respondents indicating an identifiable impact upon their research as a result of attendance at the 5th International Symposium.

Aspect	May survey responses	December survey responses
Expansion of existing research project	6	8
Design of new research project	7	5
Completion of funding request for new research project	9	5

Descriptions of these research projects or funding requests by survey respondents are listed below:

- Expansion of an existing research project
 - Animal mortality management in Tunisia
 - South Australia carcass disposal project "Managing mass carcass disposal in the event of an FMD outbreak in SA"
 - Expanded rabies prevention model
 - About 30 attendees participated in a workshop during the Symposium to provide feedback on our ongoing research project. We have made several specific refinements to our work based on the very helpful input we received. Some provided papers as a follow up to the meeting and I have had further conversations with a few.
 - We have an ongoing poultry mortality disposal project. The Symposium was a chance to evaluate our approaches, refine our methodologies, and discuss with collaborators the next steps needed. We also came out of the Symposium freshly motivated and inspired to continue working hard on this research.
 - Whole house euthanasia
 - Animal mortalities database
 - Completed aboveground burial project and presented at international conference
 - The vehicle undercarriage wash system did not provide sufficient pressure to remove a layer of grease, so the potential exists for further collaborative studies with the University of Delaware senior engineering students.
 - Wellbeing of farmers and responders research proposal approved in Ontario with

- industry
 - Trench composting as a new disposal method
- Design and/or implementation of a new research project
 - Modeling provincial dog management
 - Dog owners must register the dog with the number of local governments, to feed chain, the campus housed the family dog, so the dog is not roaming. Have annual rabies vaccination for dogs. When dogs show signs of unusual behavior, dog owner must inform the veterinary staff
 - TSE resilience during composting
 - Anthrax soil sampling
 - Plans for the validated final product will be posted on the USDA APHIS Veterinary Services website. The product has not yet met our minimum requirements
 - Formulated idea for do-it-yourself undercarriage wash station plans to be posted on USDA website, but have not followed up on this with subject matter experts
 - Feedstock type and turning frequency trial
 - Impact of fly reduction by compost elimination
- Completion of a funding request or grant application for a new or existing research project
 - US Poultry - fermentation in ag bags as a "quick" first step in disposal of poultry carcasses
 - US Poultry – carcass reduction and mixing
 - Ontario Ministry of Agriculture Food and Rural Affairs - mortality composting and burial
 - Application includes investigators from Ontario, Alberta, and Virginia
 - Extension to funding of an existing grant on animal mortality management
 - Request for a new project involving foreign animal disease response
 - Whole-barn poultry CO₂ gassing
 - Viet Nam - management of herd dogs and dog herd monitoring
 - Request for a mortality disposal research project that was ultimately not funded
 - New multi-institutional, multinational collaboration that could still bear fruit in the future
 - Vehicle wash system
 - Submitted work plans and received funding for two additional years of research

Software and Patents

A total of six respondents to the survey indicated that they had developed or continued to develop software following the Symposium. Four of these respondents described the software and how information from the Symposium specifically enhanced their work with software:

- An Excel based carcass disposal calculator has been developed in an Australian context to assist with stakeholder consultations and to present scenarios to workshops
 - Similar calculator to the Carcass Disposal Option Calculator demonstrated at the Symposium
- Advising biosecurity IT specialist on the technical aspects of 3D and improving functionality of our existing response data management system, Bioweb/Max
- Continuing to explore more effective ways of reporting information from infected premises in a response
 - For example, the use of I-pads for downloading photos and on-farm information to support key decision making

- Uploading hard copy forms onto I-pads
- Animal identification registration software

Forty-one Symposium participants answer the question concerning patents applied for and (or) awarded in the year following the Symposium. All answered 'none.'

Publications and Creative Works

Fourteen survey respondents indicated that their accomplishments after attending the Symposium included a publication and (or) another type of creative work. Descriptions provided by these respondents are summarized here:

- Webinar
- Proceedings paper
- Article in *Biocycle* "Managing Avian Flu Mortalities"
- Brochure re: Livestock and Poultry Morality Disposal in Pennsylvania
- Video on biosecurity
- Video on biosecurity benefits of using farm freezers <https://youtu.be/B-JFzt8NOA>
- Two posters and a forthcoming publication from our client's governmental agency
- Xu, S., Harvey, A., Barbieri, R., Reuter, T. Stanford, K., Amoako, K., Selinger, L. and McAllister, T.A. 2016. Inactivation of *Bacillus anthracis* spores during laboratory-scale composting of feedlot cattle manure. *Front. Microbiol.* 7:806. doi: 10.3389/fmicb.2016.00806

Governmental Testimonies and Consultations

Forty-four Symposium attendees indicated that they had responded to government requests for technical guidance or other assistance. What follows is an edited list of descriptions provided by survey participants:

- Replied to government E-mail requests for information on best practices
 - Regularly, 4-5/month including international
- Assist with carcass disposal after Winter Storm Goliath
- Technical guidance on ventilation shut down policy and dry cleaning of poultry sheds
- Technical guidance related to air-curtain incineration
- Inter-governmental exchange of experts; peer-evaluation of policy documents and simulation exercises
- Updated guidance on burial of livestock
- State of Oregon requested guidance and information about mortality composting
- Served as a subject matter expert on composting during HPAI/LPAI outbreak in Indiana
- Helped with composting in response to poultry house flooding following Hurricane Matthew
- Traveled to Azerbaijan to help government prepare for HAPI outbreak
- Have written guideline to monitor and investigate rabies, prevention and response to outbreaks of rabies have occurred
- Development of an emergency management plan for reportable diseases in the Québec swine sector
- Technical guidance on developing best management practices and videos on routine mortality composting for the British Columbia Ministry of Agriculture
- Continued technical support to the U.S. EPA, USDA, and DHS
- Assisted local Department of Environmental Quality with update of their composting rules to allow for more carcass composting

- Provided trainings/presentations in five different states
- Have assisted state agencies with technical questions
- Made contact with a provincial regulator for Ontario at the conference and have been in touch since to help shape research priorities and ensure regulatory compliance
- Request from Wisconsin (state agencies and USDA-APHIS) for consultation on composting goat manure from control of Q Fever
- Worked with Delaware Department of Agriculture to develop new response plans
- Liaised with Welsh Government and Defra on recent changes to EU legislation on animal by-products
- Twice provided training and assistance with LPAI outbreak
- Consulting with state subject matter experts on composting protocols
- Provided advice on 3D issues to the Victorian Chief Veterinary Officer
- Chairing a National 3D Task Group for Australia
- Participated in the 3D Quads Group meetings
- Have become a local disposal contact within my USDA offices and states department of agriculture
- Provided input on improving SOPs
- Utilized composting SME's during outbreak of avian influenza in our state
- Provided input into APHIS report on HPAI
 - That rendering didn't contribute to spread of HPAI, rather improper handling of material, not material's destination
- Review of USDA-APHIS avian influenza publications
- Replied to government E-mail requests for information on best practices
 - Regularly, 4-5/month including international
- Assist with carcass disposal after Winter Storm Goliath
- Technical guidance on ventilation shut down policy and dry cleaning of poultry sheds
- Technical guidance related to air-curtain incineration
- Inter-governmental exchange of experts; peer-evaluation of policy documents and simulation exercises
- Updated guidance on burial of livestock
- State of Oregon requested guidance and information about mortality composting
- Served as a subject matter expert on composting during HPAI/LPAI outbreak in Indiana
- Helped with composting in response to poultry house flooding following Hurricane Matthew
- Traveled to Azerbaijan to help government prepare for HAPI outbreak
- Have written guideline to monitor and investigate rabies, prevention and response to outbreaks of rabies have occurred
- Development of an emergency management plan for reportable diseases in the Québec swine sector
- Technical guidance on developing best management practices and videos on routine mortality composting for the British Columbia Ministry of Agriculture
- Developed best management practices and videos on routine animal mortality composting for the provincial Ministry of Agriculture
- Updated biosecurity training given to USDA NRCS staff
- Have organized and participated in 50 conferences and seminars, training for veterinary

- officials on the prevention and control of animal diseases transmissible to humans
- Pre-selection of potential disposal sites for mass mortality situations
- Worked with leadership team to develop biosecurity information to distribute to our offices in the state
- Worked with other government agencies to help create disposal plans with industry to prepare for outbreaks in the future

General (Other Impacts, Likelihood of Future Attendance, Additional Comments)

The first question in this part of the survey allowed respondents to describe any impacts or accomplishments that they had not reported elsewhere in the survey; which were a direct or indirect result of attending the Symposium. The responses obtained with this question were varied and slightly more difficult to coalesce. A portion of the 40 total responses are quoted here:

- I have been invited to two workshops on managing animal by-products. There will be more such events as the UK leaves Europe and decides whether to implement regulations equivalent to the current EU Animal By-Products Regulations.
- I have been invited and included as observer and local contact in a National Veterinary Stockpile full scale exercise.
- An increase in the emergency management role in particular to do with disposal planning.
- Many of the issues/experiences that we discussed with US folk have proven to be very valuable in understanding the differences and the similarities in the environments that we work in.
- Soon I will organize awareness days on animal mortality management.
- More open view of all types of livestock disposal options.
- Now understand the impact of animal mortality and the ramifications of disposal. Able to share knowledge with colleagues.
- Collaborating on development of disposal section for APHIS VS District IMT.
- All NYS major poultry premises have been visited and surveyed for relevant information.
- Continuing to maintain trainings / collaborations w/ staff, and am "on-call" as an SME in HPAI or other related animal health emergencies; should mortality composting become a viable option for disposal in those disease eradication scenarios.
- Contacted all landfills and renderers in the state to have capacity, contact information, and contact person accessible if ever needed.
- Unique information to share with new emergency management group at WI-DATCP to facilitate more comprehensive planning for future outbreaks (troubleshooting issues, disposal procedures and requirements, lessons learned).
- FAO has chosen me to become National Technical adviser; to build national programs to control and eliminate rabies from year 2016-2020 follow the framework of ASEAN.
- North Carolina Department of Agriculture recognition of advanced composting SME status and use as such.
- Collaboration with University of Guelph
- I have had several requests to share information regarding foreign animal disease outbreak experiences. I learned other techniques for responding to disease outbreaks.
- I have strengthened collaboration and shared information on composting as a useful animal mortality management tool with friend from Tunisia.
- Invited to present to senior government officials on animal mortality management.

- Tour of Composting Facilities has helped me think about how to move forward in my area.
- A better understanding of the biocontainment protocols applied during an animal disease outbreak in the USA and opportunity to comment on our own protocols keeping in mind the US experience.
- Aware of more local resources within PA area for HPAI emergency planning.
- Collaborating with other state agency members to mitigate disposal of roadkill and conduct research into prion disease.
- Further recognition from my peers and stakeholders that I have been able to contribute in the international 3D work area and that I am able to articulate some of the real risks that we face - learning from the experiences of overseas colleagues. Recognized as the primary technical expert in province for 3D issues.
- Greater understanding of composting and other carcass disposal technology.
- I guess an intangible would be networking and putting faces with names for those I have read about or spoken to over the phone.
- Info was useful for updating our state AI protocols.
- Much better understanding of HPAI realities due to the egg facilities manager from Iowa presentation.
- Networking with disposal interests.
- Planning an exercise this month where we will be incinerating about 15,000 spent hens. Met gentleman with the incineration company at the Symposium. Have replaced the majority of the disinfectant products used by our agency with one brand I learned about at the Symposium since the company was a vendor.
- Some new equipment was purchased for field personnel.
- This symposium have an impact for me to talk about animal management on my country, I work to make a study about this topic and I need technical and financial help to make this study.
- Was able to utilize experiences from attendees and presenters in my deployment as a SME in the Indiana HPAI outbreak.
- For me this was more of an information session. I learned a lot about what not to do and what can be done. I used what I learned to help me with our whole house euthanasia.
- I started a small business to provide assistance to ranchers and organizations for carcass composting. I aim to have composting as an alternative to burial and cremation.

The second question in this part of the survey asked participants if “Based on your experience at this Symposium would you likely attend the next one?” Eight-eight percent of those answering this survey question stated ‘yes’ they would attend. Two respondents stated ‘no’ they did not plan to attend. Both had recently made employment changes. About 11% of respondents responded ‘other’ and stated that attendance would be dependent on location, when held, if travel funds are available, if new information/technologies will be presented, and if attendance is alternated with colleagues.

The third question in this part of the survey and the last entry in the entire survey allowed respondents to make additional comments about the recent Symposium or suggestions for the next Symposium. Comments and suggestions obtained in the surveys were:

- Comments
 - Great work by the organizational team. The event was very professional and informative. The networking and collaborative opportunities cannot be overlooked.

- It was an excellent meeting in all ways. Correct balance of sessions. Excellent field trips.
- Great symposium, well organized, very educational, terrific field demonstrations.
- It was very helpful to hear presentations related to recent outbreaks from an industry and government perspective. Networking opportunities are indispensable to growing knowledge and mitigating issues in the future.
- Once again it was an amazing opportunity to renew friendships and to meet new people who share the same passion for the work we do. The leadership that the US continues to show in this 3D work area is an absolute inspiration and is improving the preparedness of other countries who do not have the same level of investment in this space. Lori Miller's presentation on her experiences throughout the HPAI Response was the highlight of the program. I am very much looking forward to the next Symposium and am sure that the co-chairs will bring much enthusiasm to the planning table. Bring it on!
- The Symposium was an initial training for me; a great experience. I gained a lot of knowledge and met other professionals. Now I know more about animal mortality management.
- The symposium provided a good opportunity to meet other composting contacts in other agencies and countries.
- Was an informative, useful conference. Became aware of many other folks who could be information resources.
- The knowledge I gained from this Symposium I have shared with many others. I have recommended they attend this Symposium for the value added benefit and knowledge gained. I hope to be able to attend future symposiums.
- The Symposium was very well run and organized and informative. The speakers that talked from hands on experience with disposal issues were the most informative, although some of the research topics were quite interesting and potentially useful in a disease outbreak situation.
- I liked the format that was used and also the information discussed during the symposium.
- The farm visit was really helpful to me.
- Great event. Well organized with pertinent practical information. Thanks for pulling it all together!
- It was the most enjoyable, well-structured and beneficial conference I've attended.
- It was very helpful for me personally and for our project.
- The symposium was well organized. Well planned.
- The tours and demonstrations were especially helpful in my job.
- Suggestions
 - Will exhibit next this time with equipment previously unavailable
 - I look forward to hearing of plans for the next Symposium and discussing topics to be covered.
 - Integration of EM planning with safe food supply plan
 - Social perceptions and the economics of animal mortality management
 - How to help small farmers with mortality management?
 - How to interact with them about this important topic?
 - I hope the 6th International Symposium will assess the progress of disease in recent

years and work out plans and strategies to control the disease in the near future; priority diseases.

- Gradually come to control and eradicate disease; thus preventing spread of disease
- Try and attract a more international audience so that it isn't too dominated by US and Canada (though I fully appreciate that this may not be possible due to the agencies and businesses that sponsor the event)
- Would like to see more on disposal of the large volume of materials related to animal disease outbreaks other than carcasses, manure, and feed (i.e. PPE, equipment, other disposable supplies used in disease control efforts)
- I think the next symposium should focus on current disease outbreaks and responses to changing weather patterns.
- For future symposia, it would be nice to increase the "medical science" based presentations especially the veterinary content. Complement with content from agronomists and agricultural engineers.
- Hope we don't wait a few years for another one. For obvious reasons, the 5th Symposium was quite poultry specific, so I'd like to see other species covered a little more in depth. I guess it is a good problem to have, but there were so many good topics in break-out sessions, that I feel like I missed out on one by attending another.
- I know they are more challenging to arrange, but the more field demos . . . the better.
- Include a representative from the Department of Defense (DOD) in future meetings to discuss and explain the capabilities within the DOD that can be used in an agricultural emergency response under the Defense Support of Civil Authorities (DSCA) program.
- Information on disposal of animals contaminated with hazardous materials (heavy metals, petroleum products, etc.)
- Information on potential environmental impacts (soil, natural bodies of water, drinking water sources) of mass burial and incineration
- One Health
- Benefits of using farm freezers for routine mortality recycling
- We'd like to see more about prevention, rather than C&D. We'd be happy to help with that/participate on one of the panels at the next Symposium.
- Too much focus on research results and dry presentations
 - Not enough presentations by the "boots on the ground" practical people
- It was very focused on composting with much less information on other carcass management options

Conclusions

The 5th International Symposium on Managing Animal Mortality and Health Risk took place on September 28th to October 1st, 2015 in the vicinity of Lancaster Pennsylvania. It was attended by animal emergency responders, planners, educators, researchers, animal caretakers, livestock producers, food animal processors, food systems managers, and researchers. Information was presented through touring, oral presentations, posters, exhibits, demonstrations, group exercise, and informal discussion about effective management of mass mortality events, animal disease outbreaks, and (or) food contamination events.

This Symposium was made possible through the partnering of individuals and the organizations they

represent, education institutions, the U.S. Department of Homeland Security's Science & Technology Directorate, and the Institute for Infectious Animal Diseases.

The survey processes successfully evaluated learning outcomes. Evaluating the Symposium has led to innovation, discovery, and a deliverable which are focused on the objectives of the Symposium and the missions of contributing partners. Impacts include continued vital professional collaborations. Significant education and outreach through Extension, government, other organizations, and in academia has also resulted. Outcomes additionally include the application of new management practices on farms and in animal processing businesses. New research projects related to the efficacy and safety of depopulation, disposal and decontamination, and policy changes for various countries, provinces, states and localities are being proposed, funded, conducted and reported.

Emergency and routine management of animal bodies and (or) the remains of animals (in one form or another) will continue to be a significant challenge and a major responsibility for the sustainability of agricultural, recreational, and natural animal systems. In the future, we will face the large-scale realities of high consequence diseases, toxicological contaminants, radiological contamination, and natural disasters. Likewise, the daily management of animal deaths and byproduct accumulation under normal and natural production will increasingly challenge communities. New strategies are critical in order to protect not only animal and human physical health, but more broadly, holistic health, which involves economic, social, and environmental components. Research will be needed in order to develop effective response plans. Deliberative interactions among international, national, state, provincial, and local governments, public institutions, non-governmental organizations and the private sector must continue. Education and outreach must continue to convey new research findings in order to prevent, detect, mitigate and recover from foreign animal and emerging and/or zoonotic diseases which may be introduced through natural or intentional processes.

Appendix

Introduction to survey conducted in May of 2016:**Follow-up Evaluation**

The 5th International Symposium on Managing Animal Mortalities, Products, By-Products and Associated Health Risk was held Sept 27 – Oct 1 in Lancaster, PA. The intent of this Symposium was to strengthen collaboration and partnership, stimulate research and development of standard operating procedures, testify, serve, write, for mortality take action to change identified gaps in research, outreach, policy and/or response capabilities. Six months have passed and we would like to ask you to take a few moments to fill out the following survey/evaluation so that we can gauge the impact that this Symposium has on the work you perform, to give us an indication of the justification for future.

Introduction to survey conducted in December of 2016:**Final Accomplishment Reporting**

The 5th International Symposium on Managing Animal Mortalities, Products, By-Products and Associated Health Risk was held Sept 27 – Oct 1 in Lancaster, PA. The goals of this Symposium were to strengthen collaboration, open the way for partnerships, stimulate research and educational activity, foster the development of strategies and standard operating procedures, and identify needs in research, outreach, policy and/or response. In May of 2016, six-months after the 5th Symposium in Lancaster, the Steering Committee asked you to complete a survey to help identify how this Symposium may have impacted the work you perform and give direction to the planning of the next symposium. Thank you to all who responded to that survey.

Now, fourteen months after the 5th Symposium, the Steering Committee is asking that you take a few more minutes to complete the same (with the addition of one question) survey once again. Why? In order to document accomplishments that have been made since the last survey. We ask that you submit only "NEW" information or information which adds to an accomplishment reported in the previous survey. This survey is our 'final' request for information about the impacts of the 5th Symposium. In the next few months, a final report about the impacts of the 5th Symposium will be written and shared. Thank you for your contributions.

Body of survey, which was similar for both times the survey was conducted:

For your reference or recall, here is the link to a complete agenda on the event website:

<http://animalmortgmt.org/symposium/schedule/>

Demographics (Optional)

1. Please indicate where you are from by filling in the boxes below
 - a. Country: **fill-in box**
 - b. State/Province/Region: **fill-in box**
2. What is your professional affiliation? **Drop-down menu** – choices include: government or public enterprise, educational institution, research institution, non-governmental organization, private sector, student, other **(please specify)**

Directions: Please use the drop-down menus and text boxes associated with questions you wish to address by sharing the direct and indirect experiences you have been involved in as a result your participation in the 5th International Symposium. If your experiences and activities do not correlate with an individual question please feel free to skip to the next.

Collaborations since the 5th International Symposium (with other attendees or with someone not in attendance but whose referral or connection you obtained because of your attendance/interactions at the

Symposium)

3. With how many renewed partners or collaborators have you been in contact or worked with since the Symposium? **Drop-down menu** – Choices include: None, 1-2, 3-5, >5
4. With how many new partners or collaborators have you been in contact or worked with since the Symposium? **Drop-down menu** – Choices include: None, 1-2, 3-5, >5
5. Please describe the nature of these collaborations (focus, intentions, outcomes or shared- responsibilities; names are not necessary): Please describe **Fill-in box**

Education or Outreach

6. Expanded an existing education or outreach program: Please describe **Fill-in box**
7. Designed and (or implemented a new education or outreach program (including new courses and certificate or degree programs): Please describe **Fill-in box**
8. Completed a funding request or grant application for a new or existing educational or outreach program: Please describe **Fill-in box**
9. Presentations to stakeholders (industry groups, communities, other organizations): Please describe **Fill- in box**

Research

10. Expanded an existing research project: Please describe **Fill-in box**
11. Designed and implemented a new research project: Please describe **Fill-in box**
12. Completed a funding request or grant application for a new or existing research project: Please describe **Fill-in box**

Software and Patents

13. Software developed: Please describe **Fill-in box**
14. Patents applied for and (or) awarded: Please describe **Fill-in box**

Publications and Creative Works

15. Publications and Creative Works (not including papers and abstracts written for 5th International Symposium): Please describe **Fill-in box**

Governmental Testimonies and Consultations

16. Requests for technical guidance or other assistance from federal, state/provincial, and local governments: Please describe **Fill-in box**

General

17. Please describe any other impacts or accomplishments (not reported above) which you have had directly or indirectly as a result of your attending the 5th International Symposium: Please describe **Fill-in box**
18. Based on your experience at this Symposium would you like to attend the next one? **Drop-down menu** – Choices include: Yes, No, Other (please specify)

19. Please use the space below for any additional comments/suggestions you would like to make about the 5th International Symposium or potential plans for the 6th International Symposium. **Fill-in box**.
20. If you would be interested in serving on the Planning Committee of the 6th Symposium tentatively being considered as a May 2018 event, please provide your name and preferred email address below. **Fill-in box**