

# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

KANSAS CITY, MO ➤ MARCH 18-19, 2015

## AFTER ACTION REPORT



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# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

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# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

## Executive Summary

The **National Workshop on Livestock Carcass Management Logistics** convened March 18 & 19, 2015, at the USDA Farm Service Agency in Kansas City, Missouri. This report captures information collected from presentations, meeting notes, discussion sessions, questionnaire responses, and an online survey.

Over 70 professionals representing federal, state, and local agencies, academia, and industry met to discuss the logistical challenges associated with animal carcass disposal. Representatives from West Texas A&M University, NCD&CS, and the University of Minnesota presented their research findings on this subject.

- **Ms. Rosalynn Days-Austin**, USDA, ESF-11 Coordinator delivered welcoming remarks and introduced Mr. Rodney White –USDA, APHIS, Director, National Veterinary Stockpile, who emphasized the importance of the workshop
- **Dr. John Korslund**, DHS, S&T Directorate, Agricultural Defense Branch, explained the genesis of the project, which began in 2007, at a White House working group and resulted in Homeland Security Presidential Directive 7
- **Ms. Lori Miller**, USDA, APHIS discussed the challenges with the disposal of infected carcasses. She cited lessons learned from previous Foot and Mouth Disease (FMD) outbreaks in the United Kingdom, Japan, and South Korea. She spoke about a study that looked at various means of disposal, such as, landfill, rendering, incineration, and composting. It resulted in a tool, available to decision makers, which identifies how best to dispose of these carcasses.
- **Dr. Bob DeOtte**, West Texas A&M University discussed the High Plains Study, which identified all the landfills, renderers, feedlots, dairies, and cold storage warehouses in an area of the country which produces approximately 80% of the nation's fed cattle. The project also looked at numerous transportation issues.
- **Mr. Mike Mayes**, North Carolina Department of Agriculture and Consumer Services, spoke about gaps in the transport and disposal of carcasses. This project looked at the swine and dairy states, and determined the current number of swine - North Carolina alone has 8.6 million - exceeds disposal capabilities. He then gave a brief preview of the Disposal Calculator.
- **Dr. Fernando Sampedro Parra**, University of Minnesota, discussed a transportation risk assessment for the transmission of FMD during movement of cattle and swine carcasses from infected premises to a disposal site. He showcased a risk analysis framework that uses a tool set to assess the level of risk on three key areas: release of the hazard, exposure to the hazard, and consequences of the exposure. The study evaluated certain likelihoods resulting from movement of carcasses from an FMD infected premise.
- A **Panel Discussion** focusing on the impact of findings was facilitated by Dr. Bob DeOtte and the panelists included Dr. Bill Brown (Kansas), Dr. Greg Christy (Florida), Dr. TR Lansford (Texas), Dr. Fernando Sampedro Parra University of Minnesota), Dr. Nick Striegel (Colorado), & Dr. Jimmy Tickel (North Carolina).

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- **Mr. Mike Mayes** demonstrated the Disposal Calculator, highlighting its features and capabilities.
- **Dr. Shannon Degenhart**, West Texas A&M University, demonstrated the web-based Routes and Ports Tool, developed through the Panhandle Regional Planning Commission (PRPC) project for the 26 counties in the Texas Panhandle.
- **Ms. Lori Miller** began the second day reviewing the DOT Regulations. She noted the regulations are designed for small quantities and identifying carcasses as hazardous material presents a problem. Therefore, tracking of this material by using a manifest is key. She stated, "The Uniform Hazardous Waste Manifest is required by both the DOT and the EPA."
- **Dr. Jimmy Tickel**, North Carolina Department of Agriculture and Consumer Services, discussed using VS Form 1-27 (Permit for Movement of Restricted Animals) for tracking carcasses. He reviewed the form and he noted the USDA partnership with states towards development of an event management tool and linked to the Emergency Medical Incident Reporting System.
- In the **Carcass Management Decision Process** discussion, Moderator Dr. Jimmy Tickel introduced the Incident Command Structure (ICS) management process and used a scenario to begin the discussion. He spoke about the key areas is decision making and he reviewed, the disposal matrix, the decision loop, transportation risks, and some conveyances that may work. His presentation was followed by an extensive Question & Answer period among the participants.
- In the **Facilitated Discussion**, Dr. Tickel presented an outbreak scenario and described how an integrated management team would handle an incident. The panelists were asked what approaches could be used and what tools are essential for the best response. Dr. DeOtte simulated a conversation between Colorado and Texas regarding MOUs and how it relates to an FMD outbreak. These questions facilitated the one-hour discourse among the participants.
- **Ms. Miller** closed the workshop by saying, "although it is the last year of the 5-year project, we are just starting the process of developing reference materials, and identifying gaps. Participants' feedback is invaluable at this stage because it helps target needs, and determines usefulness of materials." **Dr. Korlund** also thanked everyone for attending. He, too, iterated, "The report recommendations will be added to gaps identified in the 2009 White House study."

## Key Themes

As a result of this workshop, participants identified five key themes needing further research and development. 1) Guidelines and Policy, 2) Disposal, 3) Financial, 4) Biosecurity, and 5) Transportation. For details on these results, see [Annex C: Key Themes Based on Questionnaire Responses](#).

# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

## Introduction

The National Workshop on Livestock Carcass Management Logistics was conducted to assemble federal, state, local, academic, and industry professionals to review principles, policies, and practices in animal carcass disposal management. DHS, in collaboration with USDA APHIS, funded West Texas A&M University and the North Carolina Department of Agriculture and Consumer Services to conduct research on the logistical challenges of carcass management in the event of a mass depopulation and consequent disposal of animal carcasses.

The workshop was held at the USDA Farm Service Agency, Beacon Complex, in Kansas City, Missouri.

## Purpose

The workshop, convened by both the DHS S&T and the USDA, allowed the presenters to share various options for managing catastrophic livestock mortality and to discuss in an open forum the benefits and challenges of the various alternatives.

## Objectives

1. Present carcass management logistical challenges
2. Review transportation issues, including permitting, regulatory restrictions, public perceptions, and risks
3. Showcase regional carcass management planning tools
4. Identify paths forward addressing gaps and recommendations

## Assumptions

- Animal carcasses may require transport out of a control zone and potentially across state lines for any disposal options not involving onsite disposition
- Improved transport plans are needed at the federal and state levels
- Animal production, disposal, and other appropriate industry stakeholders' input is crucial to the planning process

# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

## DAY 1

### OVERVIEW OF PRESENTATIONS

#### Welcoming Remarks

Ms. ROSALYNN DAYS-AUSTIN, USDA, ESF-11 COORDINATOR

Ms. Days-Austin opened the workshop and delivered both the welcoming remarks and administrative comments.

MR. RODNEY WHITE –USDA, APHIS DIRECTOR NATIONAL VETERINARY STOCKPILE EMERGENCY MANAGEMENT & DIAGNOSTICS

Mr. White provided additional comments about the workshop, including discussing the Direct Surveillance, Preparedness and Response, Services Logistics Center, USDA APHIS. He said several disposal options may be needed in an emergency and rhetorically asked, **“Do we have enough capacity?”**

DR. JOHN, KORSLUND, DVM, DEPT. OF HOMELAND SECURITY, S&T DIRECTORATE, AGRICULTURAL DEFENSE BRANCH

Dr. Korslund described the role of DHS and provided a timeline of its activities, including the genesis of the project and program funding. The work began in 2007 at a White House working group and the national security subcommittee identified the gaps for HSPD 7.

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*Homeland Security Presidential Directive (HSPD) 7 –  
December 2003 - establishes a national policy for Federal  
departments and agencies to identify and prioritize critical  
infrastructure and to protect them from terrorist attacks. The  
directive defines relevant terms and delivers 31 policy  
statements. These policy statements define what the  
directive covers and the roles various federal, state, and  
local agencies will play in carrying it out.*

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# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

## Project Description

Ms. LORI MILLER, PE, USDA, APHIS, VETERINARY SERVICES; SCIENCE, TECHNOLOGY AND ANALYSIS SERVICES (STAS), SENIOR STAFF OFFICER/ENVIRONMENTAL ENGINEER

Ms. Lori Miller discussed the Depopulation, Disposal, and Decontamination (3D) project, including challenges with disposal of infected or contaminated animals. After providing historical context by highlighting the various ways the United Kingdom, Japan, and South Korea managed disposal of livestock with FMD, Ms. Miller gave an overview of the various informational resources that could be helpful when managing carcasses of presumed infected livestock.

These resources included a matrix, decision loop, and checklist tool (see Figure 1) that facilitates selection of optimal carcass management options, such as landfill, rendering, incineration, composting, open air burning, and on-site burial. The tool

was reviewed by a USDA-convened panel of experts comprised of federal, state, and local government and private industry representatives.

Ms. Miller also discussed online resources, such as the EPA's Incident Waste Decision Support Tool (I-WASTE DST) website (<http://www2.ergweb.com/bdrtool/login.asp>) with databases listing landfills and landfill capacity; an expanded Prioritization Analysis Tool for All-Hazards (PATH) and Analyzer for Wide Area Restoration Effectiveness (AWARE) tool originally developed for the Department of Defense (DOD) but modified to address agriculture and scheduled for beta testing in September 2015.



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Figure 1: Decision Loop Tool

See [Annex B](#) for a list of questions, answers, and comments related to this discussion.

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## High Plains Study Findings

DR. BOB DEOTTE, PHD, PE, PG, PROFESSOR OF CIVIL & ENVIRONMENTAL  
ENGINEERING, WEST TEXAS A&M UNIVERSITY (WTAMU)

Dr. DeOtte discussed the findings, challenges, and significant progress the *High Plains Study* has made over the past several years. He acknowledged several important partners that participated in the study, especially Dr. Jon Zack's contributions. These partners include:

- USDA APHIS
- Texas Animal Health Commission
- Texas A&M Transportation Institute
- University of Minnesota Center for Animal Health and Food Safety
- North Carolina Department of Agriculture and Consumer Services

Dr. DeOtte acknowledged the logistical challenges associated with the disposal of 50,000 head of cattle. Both the cost, approximately \$86M, and the acreage required for burial, approximately 64 acres, would be overwhelming.

However, the study primarily focused on the resources currently available to address a large-scale livestock emergency. The study evaluated the capacity of landfills, renderers, and cold storage warehouses in proximity to beef Concentrated Animal Feeding Operations (CAFOs), dairy CAFOs, and dairies within the five state area of Colorado, Kansas, Oklahoma, New Mexico, and Texas, which contains 80% of the feeder cattle in the United States. The study also addressed transportation issues, including available dump trucks and render haul vehicles, the use of placarding, and availability of railroad transportation. Finally, the study collected information from EPA and state databases, on landfills and renderers, as well as conducted surveys and telephone questionnaires.

## North Carolina Study Findings

MR. MIKE MAYES, EMERGENCY PROGRAMS DIVISION, NORTH CAROLINA DEPARTMENT  
OF AGRICULTURE AND CONSUMER SERVICES (NCDA&CS)

Mr. Mayes spoke about gaps in the transportation and disposal of carcasses in the major US swine and dairy production region. The project primarily looked at the following swine and dairy states:

- Wisconsin
- Iowa
- California
- Minnesota
- North Carolina

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NCDA&CS found that the current number of swine exceeds disposal capabilities. North Carolina alone has 8.6 million swine; if 10% of the population, or 860,000 swine, were affected by a disease outbreak, it would equate to 129 million pounds of material. According to the NC Disposal Calculator web-based tool, it would take 45 days to dispose of all the material. This tool uses livestock census data and Google Maps to produce an overview of the area involved. In addition, the study considered other disposal challenges, such as unsuitable soil for burial 10 feet below ground and high water tables which could prevent carcass burial. Finally, the study identified challenges associated with the following transportation parameters which could affect disposal capabilities:

- Vehicle leakage
- Carcass pre-treatment
- Vehicle pathogen emissions
- Vehicle contamination

See [Annex B](#) for a list of questions, answers, and comments related to this discussion.

## Transportation Risk Assessment Briefing

DR. FERNANDO SAMPEDRO PARRA, PHD, UNIVERSITY OF MINNESOTA

Dr. Sampedro discussed a risk assessment for the transmission of FMD during movement of cattle and swine carcasses from infected premises to a disposal site. A risk analysis framework that used a tool set and scientific information was utilized to assess the level of risk. The risk analysis focused on three key areas:

- Entry assessment: Release of the hazard
- Exposure assessment: Exposure to the hazard
- Consequence assessment: Consequences of the exposure

The scope of the study evaluated certain likelihoods by movement of infected carcasses:

1. Animal carcasses from FMD-infected premises will contain an infective dose
2. FMD virus will be released into the environment from the carcasses through leakage and aerosolization of infected body fluids
3. Susceptible livestock will be infected by FMD virus during the transportation of carcasses

After presenting a review of the types of conveyances normally used to haul both live and dead animals, he discussed some of the assumptions associated with movement of these animals:

- Carcasses will be intact
- Direct routes to the disposal site will be available

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- Carcasses will be moved immediately after euthanasia
- Vehicle will be properly cleaned and disinfected
- Vehicle will be driven by certified movers
- Bio-Zip™<sup>1</sup> sealable liners work properly and will not leak

Dr. Sampedro also discussed different pathways of contamination such as fluid borne or airborne pathogens from the contaminated animal. The report calculated the estimated timeframe of depopulation for swine, dairy cattle, and feed cattle.

The estimated risk varied based on how many measures were used (i.e., Bio-Zip bag, plus tarp results in negligible risk). The risk of FMD infection of susceptible livestock associated with the movement of infected carcasses by leakage, spillage, and aerosolization of carcass fluids would be negligible when using a standard rendering truck (tailgate sealed and tarp cover) and a Bio-Zip bag. The risk would be low when using a roll-off/dump truck with a Bio-Zip sealable liner. Other scenarios would have moderate to high risk levels if using uncovered standard rendering trucks, uncovered roll-off/dump trucks, or covered roll-off/dump trucks and a liner.

See [Annex B](#) for a list of questions, answers, and comments related to this discussion.

## Panel Discussion: Impact of Findings

FACILITATOR: DR. BOB DEOTTE, WTAMU

Panelists: Dr. Bill Brown (Kansas), Dr. Greg Christy (Florida), Dr. TR Lansford (Texas), Dr. Fernando Sampedro Parra (Minnesota), Dr. Nick Striegel (Colorado), & Dr. Jimmy Tickel (North Carolina)

Dr. DeOtte began the panel discussion by asking a probing question to set the stage or scenario. He asked, "Where is your state's largest concentration of livestock?"

Three respondents from different geographical areas of the country fielded the question. Replies included, "In Colorado the feedlots are located on the eastern side", "in North Carolina the eastern side (coastal) has 900k head of swine", and "the Texas Panhandle has 2.2m head of cattle."

These revelations led to further comments and questions, primarily centered on a few key areas. These include:

- Possibility of removing the "stamping out option." The huge number of animals at the sites makes this option untenable and may no longer be a reasonable approach. The efficacy of this option is doubtful but moreover, the question of

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<sup>1</sup> Use of the Bio-Zip trade name does not constitute endorsement by DHS, USDA, WTAMU, NCDACS, or UM. The name is used representative of a type. Bio-Zip is a trademark sealable liner product of Waste Management Inc.

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carcass disposal remains. The industry is too big and too complex to use the old 2001 Red Book as guidance.

- If disposal is mandated, then processes are needed for managing large herds. An option worth considering is allowing the animals to recover from the disease (e.g., FMD) before sending them to slaughter. This would reduce the immediate impact on disposal efforts.
- Quarantine measures will have to be developed and instituted for managing large animal populations. It is important to recognize that feedlots are suitable quarantine locations. This addresses the issue of animal welfare.
- All disposal options must be considered, including novel approaches such as alkaline digestion, and incineration.

Biosecurity challenges must be addressed. Many questions and comments surrounded the use of the Bio-Zip liners with audience members asking about availability and general use.

See [Annex B](#) for a list of questions, answers, and comments related to this discussion.

## Disposal Calculator Demonstration

MR. MIKE MAYES, EMERGENCY PROGRAMS DIVISION, NCDA&CS

Mr. Mayes spent a few minutes describing the Disposal Calculator. He stated the disposal calculator started out as an excel program then converted to a web-based application. The tool incorporates landfills and rendering facilities across the United States. It has the ability to input a starting location, selection of disposal options (i.e. landfill, renderer, etc.), types of conveyance to be utilized, and animal type.



In terms of outputs, the calculator estimates total weight, and can also show routing from the premises location to the disposal site using google maps. The calculator then rolls everything into a summary slide.

A screenshot of the Disposal Calculator's summary slide. It displays the following information: "129,000,000 lbs of material for disposal" with a "Disposal Calculator" button next to it. Below this, it lists "10 closest landfills - approx. 250,000 lbs per day" and "3 closest rendering facilities - approx. 1m lbs per week". Under the heading "Results:", it shows "13 Locations - 5 vehicles to each location (80 vehicles)", "57 trips for each vehicle", "779 total trips", and "45 days to dispose of the material".

A few questions were asked by the audience after Mr. Mayes demonstrated the disposal calculator. These included entering the weight of measurement (lbs. vs tons), who maintains the tool, and if the tool incorporates DOT regulations.

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See [Annex B](#) for a list of questions, answers, and comments related to this discussion.

## Routes and Ports

DR. SHANNON DEGENHART / DR. BOB DEOTTE, WTAMU

Dr. Degenhart demonstrated the Routes and Ports tool developed with an all-hazards approach. She presented the web-based tool and how it links to Delorme Street Atlas™ USA.

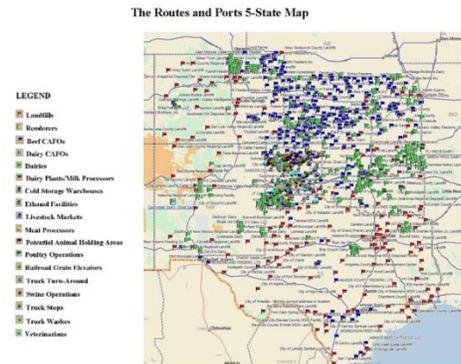
Routing information details include input origin and destination; the tool will recommend the best route based on the situation. Alternative routes (diversion) can also be entered. It also allows monitoring of the location of vehicles, based on GPS and time/distance/speed information.

Key points include location of feedyards and dairies, and available landfills and rendering plants.

Two questions posed by the audience were related to using the avoid feature and about how to configure the quarantine zone around the suspect site.

The remaining comments centered on development and usage of an MOU to assist in using the tool.

See [Annex B](#) for the response to the questions related to this discussion.



# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

## DAY 2

### OVERVIEW OF PRESENTATIONS

#### Recap from Day 1

DR. BOB DEOTTE, WTAMU

Dr. DeOtte announced the upcoming 5<sup>th</sup> International Symposium on Animal Mortality Management, September 27 – October 1, 2015, in Lancaster, Pennsylvania, sponsored by the Department of Homeland Security.

He recapped presentations from the previous day by saying, “**stamping out will not be the only approach in an event**”; “although, we must continue to meet OIE standards.” He cited the example of disposal in the wake of the 1929 FMD outbreak in California where carcasses were dumped into a large pit/hole. This would not occur today for a variety of reasons including protection of groundwater and level of public interest. Based on the panel discussions, he reiterated that individual states and industry have a say in disposal decisions in collaboration with the federal government. Moreover, he mentioned that decisions depend on state-specific needs and constraints, which vary widely among states and must be considered.

#### DOT Rules, Tracking, Manifest

MS. LORI MILLER, PE, USDA APHIS

Ms. Miller reviewed the Department of Transportation (DOT) regulations regarding hauling hazardous materials, and the challenges of adhering to the appropriate regulations when transporting carcasses. When deciding how to move carcasses safely, she emphasized the need to consider regulations, disinfection, and tracking of vehicles transporting carcass contaminated with biological, chemical or radiological agents.

Ms. Miller then addressed two key problems or questions:

- 1) **Responsibility:** If the state or US government requires destruction of animals to contain disease, do they own the carcasses and will they be responsible for transport costs and environmental liability?

#### Department of Transportation

**Hazardous Materials Program Definitions** And General Procedures at 49 CFR 105.5(b): Hazardous material means a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. 5103).

The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table

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- 2) **Identification/Classification:** The DOT regulations discuss infectious materials in small packages of less than 175 pounds and do not mention bulk transport of materials; how to transport large quantities of potentially infected carcasses is unclear.
- 3) **Tracking:** DOT regulations include a requirement to track shipments using a manifest system. This process is unfamiliar to animal health responders. A manifest typically includes the following:
  - The key component is the **Uniform Hazardous Waste Manifest** which is a form prepared by all generators who transport hazardous material for off-site treatment, recycling, storage, or disposal
  - It is a paper document with multiple copies. It contains information on the type and quantity of the waste, instructions for handling the waste, and signature lines for all parties involved in the transport and disposal process.
  - The manifest is required by both U. S. Department of Transportation (DOT) and U. S. Environmental Protection Agency (EPA)
  - Each party that handles the waste signs the manifest and retains a copy to ensure critical accountability
  - Once the waste reaches its destination, the receiving facility returns a signed copy, confirming that the waste has been received
  - A number of states have additional requirements for use of the form

## VS Form 1-27, Permit for Movement of Restricted Animal

DR. JIMMY TICKEL, DVM, NCDA&CS

Dr. Tickel's presentation focused on the possibility and challenges of using the VS form 1-27 instead of a DOT manifest when managing carcasses. While currently untested, its use with live infected animals supports the notion that the 1-27 could be used for dead animals. If allowed, this could address the need to systematically track the movement of the carcasses from the original premises to their final location.



Dr. Tickel also introduced the Emergency Management Response System (EMRS), a web-based emergency

management tool developed by the USDA in partnership with state agencies. The computer based system could be used to track resources and personnel, create the 1-27 Form, and automatically link to destination point of contact for interstate movement.

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*NOTE:* Animals that have died due to welfare/situational issues but are neither infected nor infectious could be tracked as a separate category.

See [Annex B](#) for a list of questions, answers, and comments related to this discussion.

## Carcass Management Decision Process Discussion

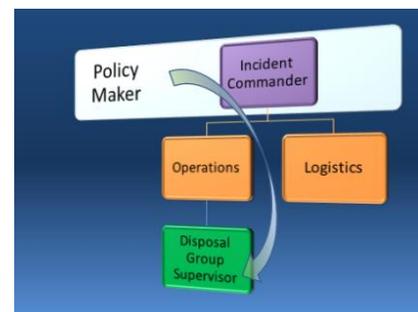
MODERATOR: DR. JIMMY TICKEL, DVM, NCDA&CS

Participants: Ms. Lori Miller, Dr. John Korlund, Dr. Bob DeOtte, Mr. Mike Mayes

Dr. Tickel discussed the various resources available when managing carcasses and the decision-making process when deciding which resources to use. This is especially important because cattle haulers do not regularly deal with animals that have been infected with Foreign Animal Disease (FAD), though haulers routinely transport uninfected carcasses.

Dr. Tickel first reviewed use of the web-based VS Form 1-27 and emphasized the truck must remain sealed until it reaches its final destination. He noted his experiences, using this process when needing to transport live animals with diseases and said it should be applicable when moving dead animals with diseases. He also discussed the benefits of using the web-based USDA EMRS program to track the animal, especially when moving infected animals across state lines.

Dr. Tickel then introduced the Incident Command Structure (ICS) management process by using the example of a Type 2/3, phase 2 of an FMD outbreak (regional, multiple premises). He suggested using realistic numbers for the exercise before a real event occurs because it would prompt the decision process to unfold and introduce the problem to officials.



This decision making process includes six key areas:

- Consult Federal Plan
- Analyze Disposal Options/Decision Tree
- Assess Transport Risk
- Use Disposal Calculator
- Develop Memorandum of Understanding (MOU)
- Implement Proper Permitting

Dr. Tickel also emphasized the importance of consulting the Red Book when considering the following:

- Prevent the spread of FMD
- Protect the environment

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- Conserve meat or animal protein
- Decide if slaughter is possible
- Permit any movement through Incident Commander (IC)
- Observe local and state regulations
- Use MOUs or other agreements for disposal if needed
- Consider cost and stakeholder acceptance
- Use FADPreP SOP with matrix, decision tree/loop, checklist

He further reviewed the disposal matrix, the decision loop, and transportation risks, and listed some conveyances that are proven effective. Dr. Tickle ended by showing the Disposal Calculator and re-introducing Permitting, Decon and Biosecurity.

See [Annex B](#) for a list of questions, answers, and comments related to this discussion.

## Facilitated Discussion: Identify Gaps & Path Forward

DR. BOB DEOTTE AND DR. JIMMY TICKEL

Dr. Tickel introduced an outbreak scenario with an incident management team, including a Planning section with a policy group, and an Operations section with a Disposal Group Supervisor, and a Transportation Group Supervisor. Dr. Tickel then posed the following questions to the panelists:

- What information is necessary to choose the best carcass management option(s)?
- Capacities? Issues? Gaps?
- Policy, Guidance?
- What tools are essential to make this decision?

Dr. DeOtte simulated a conversation between the states of Colorado and Texas regarding MOUs and the relationship to an FMD outbreak. He stated the MOU should include Purpose, Authorities, Supporting Documents, No Financial Obligation, No Financial Commitment, Reviewed Annually, and a Decision Process. Both Dr. DeOtte's and Dr. Tickel's questions and scenarios drove the one hour discussion among participants.

See [Annex B](#) for a list of questions, answers, and comments related to this discussion.

## Closing Remarks

DR. JOHN KORSLUND AND MS. LORI MILLER

Ms. Miller closed the workshop by saying, **“It is the last year of the 5-year project.”** “We are just starting the process of developing reference materials, and identifying gaps. Participants' feedback is invaluable now because it helps target needs, and determines the usefulness of materials.”

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She also noted:

- The final report will be out before Dec. 31, 2015. It will be posted on the APHIS website and will be available by request.
- Report recommendations will be considered when identifying future research priorities.

Both Ms. Miller and Dr. Korslund thanked everyone for attending. Dr. Korslund also stated “The report will be publically available and recommendations will be added to gaps identified in the 2009 White House study. Moreover, the integrated project team will sort the report findings for consideration and possible additional funding.”

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## ANNEX A: AGENDA

Day 1 Wednesday, March 18, 2015

TIME	TOPIC & PRESENTER
11:30 am – 12:00 pm	<b>Working Lunch</b>
12:00 pm – 12:10 pm	<b>Administrative Remarks</b> <i>Rosalynn Days-Austin, United States Department of Agriculture, Animal and Plant Health Inspection Service (USDA-APHIS)</i>
12:10 pm – 12:50 pm	<b>Welcoming Remarks</b> <i>Mr. Rodney White –USDA, APHIS Director National Veterinary Stockpile Emergency Management &amp; Diagnostics</i> <i>Dr. John, Korslund, DVM, Dept. Of Homeland Security, S&amp;T Directorate, Agricultural Defense Branch</i>
12:50 pm – 1:00 pm	<b>Break</b>
1:00 pm – 1:30 pm	<b>Project Description</b> <i>Ms. Lori Miller, USDA-APHIS</i>
1:30 pm – 2:00 pm	<b>High Plains Study Findings</b> <i>Dr. Bob DeOtte, West Texas A&amp;M University (WTAMU)</i>
2:00 pm – 2:30 pm	<b>North Carolina Study Findings</b> <i>Mr. Mike Mayes, NC Department of Agriculture and Consumer Services (NCDA&amp;CS)</i>
2:30 pm – 2:45 pm	<b>Break</b>
2:45 pm – 3:25 pm	<b>Transportation Risk Assessment Briefing</b> <i>Dr. Fernando Sampedro Parra, University of Minnesota</i>
3:25 pm – 4:15 pm	<b>Panel Discussion: Impact of Findings</b> <i>Facilitator: Dr. Bob DeOtte, WTAMU</i> <i>Panelists: Dr. Nick Striegel, Dr. TR Lansford, Dr. Jimmy Tickel, Dr. Bill Brown, Dr. Greg Christy, Dr. Fernando Sampedro Parra</i>
4:15 pm – 4:30 pm	<b>Disposal Calculator Demonstration</b> <i>Mike Mayes, NCDA&amp;CS</i>
4:30 pm – 4:45 pm	<b>Routes and Ports</b> <i>Dr. Bob DeOtte &amp; Dr. Shannon Degenhart, WTAMU</i>
4:45 pm – 5:00 pm	<b>Wrap Up</b> <i>Ms. Lori Miller, USDA-APHIS</i>

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## Agenda

Day 2 Thursday, March 19, 2015

TIME	TOPIC & PRESENTER
7:30 am – 8:00 am	<b>Working Breakfast</b>
8:00 am – 8:20 am	<b>Recap from Day 1</b> <i>Dr. Bob DeOtte, WTAMU</i>
8:20 am – 8:50 am	<b>DOT Rules, Tracking, Manifest</b> <i>Ms. Lori Miller, USDA-APHIS</i>
8:50 am – 9:20 am	<b>VS Form 1-27, Permit for Movement of Restricted Animals</b> <i>Dr. Jimmy Tickel, NCDA&amp;CS</i>
9:20 am – 10:30 am	<b>Carcass Management Decision Process</b> <i>Moderator – Dr. Jimmy Tickel</i> <i>Participants – Ms. Lori Miller, Dr. John Korslund, Dr. Bob DeOtte, Mr. Mike Mayes</i>
10:30 am – 10:45 am	<b>Break</b>
10:45 am – 11:45 am	<b>Facilitated Discussion: Identify Gaps &amp; Path Forward</b> <i>Dr. Bob DeOtte, WTAMU</i>
11:45 am – 12:00 pm	<b>Closing Remarks</b> <i>Dr. John Korslund, DHS</i> <i>Ms. Lori Miller, USDA-APHIS</i>
12:00 pm	<b>Conclude</b>

# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

## ANNEX B: QUESTIONS, ANSWERS, COMMENTS, AND DISCUSSION ITEMS FROM WORKSHOP

Project Description Discussion, Ms. Lori Miller

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### Questions (Q), Answer (A), Comments (C)

- Q** What standards would shipments need to meet to safely ship carcasses?
- A** Shipments would need to be leak-proof to contain leachate and aerosols.
- Q** What do we mean by “disposal”?
- A** Original response: Regulations were written many years ago (50's). That approach has numerous drawbacks. (Recent experiences/outbreaks) have highlighted drawbacks to established disposal regulations/procedures/recommendations. We need to find a better way.  
Amended response: Disposal means landfill, rendering, incineration, composting, open burning, and burial.
- C** U.K. findings of human health problems related to the different disposal options –see chart from slide deck. In 2001, composting was not an option for infected carcasses. It is an option now.
- C** Carcass disposal options compared on 15 criteria. Findings converted into a decision matrix/tool. Check list developed for use with decision matrix.
- C** Animals should not be depopulated faster than can be appropriately disposed of. There are very specific conditions for classification as “hazardous waste.”
- Q** Is it possible to transport infected carcasses, and how can that be done?
- A** Tracking, type of equipment needed; regulations surrounding, etc. The PATH/AWARE tool, developed by Sandia Labs, is an example.
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North Carolina Study Findings, Mr. Mike Mayes

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### Questions (Q), Answer (A), Comments (C)

- Q** Does USDA have the disposal calculator? Is it available?
- A** Calculator still in beta testing. Not readily available to public just yet, but can be made available upon request. Additionally, the tool will be available if there is an emergency.
- Q** Is the data publicly available?
-

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## Questions (Q), Answer (A), Comments (C)

- A** Not yet. But, it can be requested.
- Q** Is there a way to develop a program to “eat” our way out of the problem? Now is the time to affect public perception by educating consumers.
- C** Carcass disposal is a public relations nightmare. It is a public relations issue and an issue related to trade. Countries that are FMD free do not want it to engage in use of affected cattle as a food source.
- C** We consume about the same amount of beef that we produce. For pork, we consume about 80%.
- C** Suggest we have Public Information Officials attend meetings, to begin preparing necessary messages
- C** We introduced the Meat Packers to a previous meeting and they immediately indicated they would not take the beef. It was pointed out to them, that the meat they already accepted-before the declaration of infection-would be infected as well, Question posed to packers, “What about the meat from the day before, the day before that...?”
- C** Dr. Danelle A. Bickett-Weddle made the statement at the Kansas City meeting, that FMD is no different than the current porcine epidemic diarrhea (PED) virus outbreak.
- Q** Have you looked at extra capacity at rendering facilities? Do they have capacity to pick up carcasses? Are they running at capacity now?
- A** Many facilities already run at 2 shifts per day, but could increase to 3 shifts. They could ‘ramp up’, but issues with safe working conditions and increased cost would surface.  
One rendering facility indicated they would not take infected carcasses because people would not want the products for their pets.
- Q** What if an animal is exposed but shows no clinical signs? Would the packer take it?
- A** Yes, because FMD is not a human health/welfare issue.
- Q** What about if disease has run its course and producer wants to ship those animals?
- A** There are many implications if the producer has recovered cattle. Will need state animal health officials to address the issues, including non-compliance in reporting a reportable disease.
- C** Outbreak may spread to the point that we may need to stop “stamping out” efforts and proceed directly to slaughter and while passing inspection. We will need to manage infected feedlots and establish processes for slaughter.
- C** Let’s look at the available tools, understand them, and view them as an opportunity to help with pre-outbreak roles. How can we mitigate and bullet-proof transportation, landfills, etc. now and then use the tools, during an event when needed. Are there opportunities to use these tools, other than for an FMD event?
- C** We have discussed transport and disposal and have made progress.
- C** There is also a good chance animals will die due to the disease, not just as a result of depopulation. We still need to dispose of these animals.
- C** How we make it ‘bullet proof’ also goes for landfilling. One study was looking at rendering industry, using visual

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## Questions (Q), Answer (A), Comments (C)

indicators and surrogate biologic organisms to see where potential spread occurs. Grinding process emitted aerosol, in which pathogens could still exist. Decontamination is not completely effective. Info used to change protocols in some rendering plants to accommodate infected materials. Knowing there are protocols-to return renders to normal operations- can open up the possibility to use them during an event.

**Q** Why is composting fourth on the Decision Loop?

**A** Composting requires large land area, a carbon source, and takes time. These restrict feasibility of using composting.

**A** There is also the potential of disease spread with composting at the beginning.

**A** Because composting may also be an off-site operation, transportation is still a consideration.

**A** All available tools will be important during an event.

**C** Having a large number of carcasses will double logistics. For example, a 30,000 head feedyard will have a shortage of carbon source in a hurry.

**A** During a recent avian outbreak, use of a location for in-house composting was delayed due to availability of carbon source and the amount of time needed to disinfect before composting occurred.

**C** Today, compost is saleable commodity. But, the time-factor, as well as, finding a carbon source must be considered. Other issues are water with larger carcasses and trucking costs. Having a viable commodity with demand will offset trucking costs.

## Transportation Risk Assessment Briefing, Dr. Fernando Sampedro Parra

## Questions (Q), Answer (A), Comments (C)

**Q** Are there any factors to consider for seasonality? Geographic differences?

**A** There are factors that will affect the concentrations of the virus, and...

**Q** Are you assuming in your models that 80% of the carcasses are infected?

**A** Yes

**C** Could you explain what Bio-Zip bags are?

**A** The bag is a 40ml thick PVC plastic that can fit inside dumpster. Can fit inside roll-off, is filled, sides pulled up and zipped closed.

**Q** Was temp, pH etc. considered?

**A** No, based on time frame

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Panel Discussion: Impact of Findings, Dr. Bob DeOtte moderating, Dr. TR Lansford – Texas, Dr. Nick Striegel – Colorado, Dr. Jimmy Tickel – North Carolina, Dr. Bill Brown – Kansas, Greg Christy - Florida

<b>Questions (Q), Answer (A), Comments (C), Discussion Topic (DT)</b>	
<b>DT</b>	<b>Where is your largest animal concentration of livestock?</b>
<b>C</b>	In Colorado, the concentrations of feedlots on eastern side of the state – mainly beef, but also swine and some poultry.
<b>C</b>	In North Carolina, the western edge of coastal, (900,000 head of swine) highest protein production in the world. Rural communities actually have more pigs than people. Communities exposed to 45,000 head of hogs.
<b>C</b>	In Texas, there are 11.8 million head of cattle. 2.2 million head in Panhandle (72%) of capacity. Panhandle is the location of most commercial swine operations. About 5 counties in central TX. North of cattle region are the poultry operations. Large contribution to TX Ag
<b>DT</b>	<b>Questions and Comments for the Panel</b>
<b>C</b>	Aren't we reaching the point we can define what the limit is for the stamping out option?
<b>C</b>	The Kansas state monthly working group has almost taken stamping out off the table. No possible way they can dispose of those numbers.
<b>A</b>	Colorado agrees with what KS is doing, but needs to look at what the other options are.
<b>A</b>	As far as using stamping out, it is not the way to work our way out of an outbreak. Didn't stop PEDv in NC and we don't know how it would stop FMD.
<b>C</b>	In TX, in general, considering a 100,000 hd feedyard, stamping out is not an option and we have to look beyond that.
<b>Q</b>	If we get FMD has there been anything added in the Red Book addressing feral hogs? What do we do with them? What do we do with the carcasses?
<b>C</b>	Last outbreak in U.S. was 1929. FMD did not move into the wildlife populations. Some thought wildlife is not able to become reservoir for the disease. May be self-limiting – animals susceptible to predators.
<b>A</b>	We do not have a good answer to feral swine problem in Florida.
<b>Q</b>	Before we even worry about feral swine, what about the surviving animals such as sow units (where animals have to move)?
<b>A</b>	We can create separate channels for negative hogs. You have to increase the animal's resistance to the disease. It will be an incredible challenge early on because we do not have vaccine. Animals are fit for consumption and do not present a food safety or human health risk, we need to message that, follow-up, and make it happen. Will have a whole new paradigm on how we market cattle and hogs.

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## Questions (Q), Answer (A), Comments (C), Discussion Topic (DT)

- Q** Another tool we need to consider is to be able to know more about how the animals will recover from FMD. What is the best health-wise management? Herd Management tool would also be helpful.
- C** Treating animals like post-recovery animals might be a course of action.
- C** Plumes do not travel far, aerosol transmission is not substantiated
- C** Commercial swine industry knows how to close a herd, let disease move through, and get back to negative status.
- C** Feral swine and deer, evidence indicates it doesn't remain in herds as reservoir, but they are fomites.
- Q** How do we work our way out of this? Example: 100,000 head feedyard with infected animals are we going to depopulate feedyard?
- A** Theoretically, there are some options. Good work coming out of current projects and collaborations.
- C** Look at feedyard and concentrate first on which parts of yard should be depopulated. Factors, such as cowboys and pen riders, are additional points to consider.
- C** We may also let some animals survive the disease and send them to slaughter.
- A** There is no easy answer. KS is taking the leap in the secure beef supply arena and will address feedyards. Looking at vaccine solution, if we can obtain the vaccine. Will be delayed. Looking at early slaughter, have three large packers in the state, and have them in the room on the conversations.  
We know we cannot stamp out and must look at all options.
- A** Need to pay attention to details, will still be transporting – either live animals or carcasses.
- A** Slaughter can be one way to move animals. But pre-clinical animals will be a problem because blood and plasma are used for feed.
- A** We also have dairies. The transport issue is a problem and how we market the 'meal' will be interesting.
- C** Regarding the swine industry, secure pork deals with animals that are not infected. Our industries are too big and too complex to use the old 2001 Red Book as guidance (*editor's note: there is a 2014 version of the Red Book available*)
- C** If FMD is going through feed, it will infect a lot of pigs in a short time. If blood is not processed correctly just once, all industries could be infected quickly.
- Q** Did you factor in time and money needed before we could move to depopulate?
- A** The study assumed no indemnity before depopulation.
- Q** What do you do with the animals that have been depopulated? What about the welfare perspective?
- A** It is all about quarantine management, Managing herd, circulation management,  
-We will be hitting every communication pathway possible to educate about food safety.  
-We need to think of different ways of doing this. Will be living with it until we develop the tools to mitigate it.  
-At some level feedlots become suitable quarantine locations. Animals are stationary in pens until they are taken out.
- Q** Regarding BSE and feed ban. Can blood meal, etc. be fed to cattle?

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## Questions (Q), Answer (A), Comments (C), Discussion Topic (DT)

- A** No, not to ruminants.
- Q** Does depopulation yield a high supply, low demand situation? If so, we need a strategy to balance out, so industries can re-calibrate to new market dynamic. During PED we had a low supply, yet, producers made record breaking profit.
- A** We don't know where the recalibration of supply and demand will have on the markets.
- Q** Is alkaline digestion something to consider on small properties; younger animals, or even swine.
- A** It can be an effective way to dispose of carcasses, but has limited through put. It is also expensive, (purchase, operating), And the high pH makes by-product a hazardous waste.
- A** Incineration falls into the same category, There are not many incinerators, and there is a high fuel need.
- Q** What would a response be to a 500 head grazing operation just across the state line/border?
- A** This is a very good discussion question: heightened biosecurity allows business models to continue, because we already use rendering. This workshop sheds light on possibilities using a very bio secure way. Previous plan was all carcasses to be disposed onsite, which might be ok for routine mortality. Still need to look at continuing to use rendering.
- A** In Florida, the state patrol will close the borders and will not allow the animals into state: Need to know your state's geographic maps. FL cannot bury, so would have to transport. Need to determine if they can get Bio-Zip bags large enough quickly enough. So, we think it would be good idea if national stockpile would add Bio-Zip bags. Carcasses can be disposed of at landfills in FL.
- A** One disposal option is not the best for all scenarios; the goal of Bio-Zip bag is to prevent leakage and prevent aerosol spread. We need to look at all the ways we can do this and not rely only on the manufacture of Bio-Zip bags.
- Q** What is life of Bio-Zip bags?
- A** About 15 years.
- C** We also need an idea of what sizes of bags are needed.
- A** Probably about 40 cubic yard roll offs.
- Q** We need more options. Can every state get those?
- C** In Florida, we need about a million pounds of "hog gone"
- C** We need information on quantities and sizes needed; this information can be obtained when working with manufacturers.
- C** The priority is to maximize head space. Closed bag maintains volume, open bag will slide together further.
- Q** Florida has four private landfills and wonder if they can make and use a separate entrance and have a truck wash on the side? Concerned about how to protect workers if disease is zoonotic. All of these are fenced facilities. What about wildlife?
- Q** Has anyone actually used these bio bags?

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## Questions (Q), Answer (A), Comments (C), Discussion Topic (DT)

- A** We have in Florida. Waste Management Inc. is an integral part of our plan (with the landfill company).
- Q** What happens, when you have a bag of carcasses they swell and bloat? Are the bags hard to get off the truck? Do we need separate liner so can get the bags off the truck?
- A** A liner with a seal is good
- A** There are a lot of gaps and a lot to be done.
- Q** Does every state have an MOU with the health department?
- A** An MOU very important to facilitate depopulation and disposal. Jurisdiction confusion can slow the process.
- C** We need experts around the same table to plan these activities.
- C** There are also seasonal challenges; industries challenged with environmental issues.
- C** Industry is creative and problem solving; it looks at all options, and uses whatever is available.
- C** Texas has interesting regulatory role. The current Ebola situation has increased awareness and increased the need to revisit existing plans.
- Q** Can our emergency managers read the plan (Red Book) and know what they need and need to do to help?
- A** Industry also needs to weigh in.
- A** The RRAP in the Panhandle allowed for regional planning to assist in response.

## Disposal Calculator Demonstration, Mr. Mike Mayes

### Questions (Q), Answers (A), Comments (C)

- Q** Pounds vs. tons?
- A** Because the landfills use different methods of measurement.
- Q** Who updates the tool?
- A** The EPA and APHIS funded it initially. Undergoing discussion phase to identify which agency will update it.
- Q** Does it take DOT regulations under consideration?
- A** No

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Routes and Ports, Dr. Shannon Degenhart

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## Questions (Q), Answers (A), Comments (C)

- Q** Can you select the avoid feature before starting?
- Q** Can you configure the quarantine zone around the suspect site?
- A** In an emergency, one can add the features and necessary information. For example, an Excel file (97-2003 version) can be used to update the map.

VS Form 1-27, Permit for Movement of Restricted Animal, Dr. Jimmy Tickel

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## Questions (Q), Answer (A), Comments (C)

- Q** Are we on shaky ground with the concept that it is biological waste?
- A** It is considered special waste
- Q** EMRS hard for people to access; if they work for the state, it can be complicated
- A** To make it accessible to other people. Are there parts of it we can pull out and give people access to?
- A** The apps are well built. Need veterinary service and APHIS to understand the requirements, (e.g., Ag Connect). Currently, we are working on enhanced surveillance, working with FAD, but need additional effort to use the app for the hog industry. The technology is available but needs to be linked to build awareness in veterinary service.
- Q** Is there sufficient cell tower, internet connectivity in the 'field' to use these electronic tools?
- A** It varies, but it doesn't matter. As soon as one gets within range, the data will upload.
- Q** Is there any discussion to using CVI (certificate of veterinary inspection)?
- A** The problem may be that it is commonly used. If using the health certificate process outside of the zones, we will need a clearer picture of the event. CVI does not provide this, and we must rely on the VS 1-27.
- C** During emergency management, we need to use the normal planning processes and use the permitting process as well. Kentucky has built online permitting process, which works after business hours.
- C** Paper forms are fine, but in the 'field', it may not be possible to get the forms/permits back to the EOC. We need to look at process used by DOT/highway patrol for ticketing.
- C** We had exercise last year and closed the gap. 800 permits were processed in two hours.
- A** We are becoming more "surgical" in what we are doing with FMD. In the past, we were using a sledge hammer. We need to hone this, become more precise.
- A** At some point live animals will have to move. We need to look strategically at what has to happen and who to partner

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## Questions (Q), Answer (A), Comments (C)

with.

- A There is much that we already know, where we will have issues, need to look at these and start customizing solutions.
- A Other disease events, may present solutions to problems we face.
- Q Has there been discussion and agreement about who will own the animals?
- Q The animals or the effluent?
- A At the moment, we don't know the answer to that question. People do not want to own the animals because they would have to clean them up. If we stick to procedures in place we lessen the risk. We need to review the regulations to see what might apply and what needs to be addressed.
- Q Will the states even ship the animals? In Minnesota, nothing that is infected will come into the state if the shipping states say it is clean. Media will play a large role in how things are handled.
- A North Carolina regulations stated that if FMD occurred, animals that were enroute would be stopped on highway and would be buried in the median. The regulations need to be reviewed.
- A If you have the ability to safely move carcasses across the state, across state lines should be ok (?). We need to strategically look at how we use this tool; it is the most extreme rule. (It is ugly).
- C After a workshop like this, we can go back to our states and say "never- say- never". We have to look at all options.
- Q What level of acceptance or approval is used for these forms?
- A Every state could use a VS 1-27 form but not all agencies are familiar with it. It needs to be presented all levels, if we plan to use it.
- Q Under what/whose authority is the form used? You could use Animal Health Protection Act, or you could also use DOT system (for radiological event). It must be determined beforehand.
- A If answer is 'no' we are not using the VS 1-27, then we need to figure out better ways of doing this.
- C Hazardous waste is transported all-day-long in other industries, we just need to think it out, not an easy way to do it, but we need to think out the technical issues.
- C Five years ago, North Carolina considered looking at how other industries moved hazardous waste.

## Carcass Management Decision Process Discussion, Dr. Jimmy Tickel

### Questions (Q), Answer (A), Comments (C), Discussion Topic (DT)

- DT There is a group above the incident commander who decides policy.**
- C In NC, the state veterinarian is a policy maker; the incident commander puts the policies in play.
- C Structure of command system with policy makers feeding into system (graphic slide)
- C If we can't deal with it in our own state, we do not need to take it over the state line. Planning should be pre-event,

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make scenario numbers realistic, so it makes sense.

- C Politics may affect scenarios; policy makers may appreciate the tools in the tool bag during incidents.
- C Need technical specialists in the room during pre-event planning to determine what actions/policies will work.
- C Understand what you are dealing with and then look through the options to see what works.
- C Create different scenarios and appropriate, realistic plans.
- C Plans need to be specific, not just types of equipment needed, but also the numbers of bags, trucks, etc. that will be needed.
- C Use the tools available before the event. Be familiar with the tools, understand them before the event.
- C Determine who needs to know the plans and revisit the plans regularly, especially after a turnover in key personnel. Make sure they understand the response at all levels of government, and engage all levels during training and preparations.
- C You need to work through the plans, make sure you really understand them.
- C Need to consider moving infected but not infective animals and not just carcasses. Build in protocols to determine with 95% confidence, the animals are not infective. Currently, working with swine industry because there is a lot of movement (from swine houses to slaughter).
- C Every juncture of this the risk assessment needs to be done.
- C If you are in industry you don't necessarily care about ICS. There are management tools in business; there are no operations section chiefs at the feedyards; there is a manager and a number of assistant managers or managers of particular operations, e.g. feed.
- Q What if landfills or renderers say, 'no'?
- A A good question which needs to be discussed/agreed upon at the appropriate levels before an event occurs.
- Q After an event, we will need to clean & disinfect the rendering plant. Are there any plans to address that, to document or state the plant is clean and can restart production?
- A Study findings show there is a potential for aerosolization of pathogens during grinding process. APHIS is searching for a disinfecting agent. The FDA will determine if the plant is 'ok' to resume developing feed. It is a gap and we are a couple of phases away from having recommendations and protocols in place.
- A FMD not a disease of humans – not a human safety issue. Majority of opinions from the meat packers' meeting was that normal disinfection would be appropriate to disinfect the plant and resume operations. The renderers' issue is different than meat packers. Dogs and cats are not infected by FMD, but the virus could get into livestock populations.
- DT A proposed scenario using a blank geographic location map shows an outbreak at X location and the closest landfill is Y in a non-infected state. What are you going to do?**
- A Texas does not have MOUs with other states, but addressing it. In general the MOU is a good idea. In the scenario, we don't know the answer. The infected state would look at the other state and ask, "are we a good neighbor?" Legally, the only way we could sign this MOU with another state is if there is a declaration, which has to go to the governor's

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office through emergency management. Now we have an MOU template, and this discussion about a template among the five states has been valuable.

- A** Colorado has done some MOU work with border states, following the Kansas lead.
- A** An MOU is about working across state lines to cooperate effectively to address outbreak. Once an emergency is declared, then we can work across state lines.
- A** Benefit of general MOU covers multiple situations, not only carcass disposal. Need to communicate with livestock associations and producers. What they have to say is important.
- A** An important advantage in having MOUs is it covers many situations and opens up collaboration with highway and state patrols – in-state and between states.
- A** The state emergency planners benefit as well as it fits in with their plans (EMACs). That is how they think and operate.
- C** The decision making group must include the policy makers; otherwise the MOU will initially be handicapped by the decision of the policy group. (Especially if disease is occurring on one side of the state line). Discussions will open up when the disease affects both sides of the state line.
- C** It is no longer a least-cost scenario involving hauling off your garbage. Just because it is closest does not guarantee use of the landfill.
- C** In Texas, the MOU has added value by becoming an awareness tool. We have to engage our lawyers, send it to the emergency management office, which will forward to the governor's office. If we get into a disposal incident and need to take material from other states, we need to get other agencies involved, such as environmental and law enforcement personnel.
- C** MOUs need to be general in nature and avoid being too specific, which can limit actions.
- C** Need to work with partners to learn the documentation process and come up with a standardized system like the 1-27.
- Q** Were there any particular legal issues arising that lawyers are concerned about?
- A** The legal issues, in Texas, currently relate to bureaucratic issues, such as who does what, who has bigger piece, etc.
- Q** Are there any specific technical issues or format?
- A** We believe it was the governor who had questions.
- Q** Are there precedents that are set on the hazmat side that could apply to this?
- A** We like the term, "This is biological waste."
- A** We like "biological material" better. Carcasses Transported for composting does not really constitute waste; it is material being turning into product.
- A** The most important thing is working with your staff on the MOUs.
- A** If you can tell leaders there is an MOU in place it allows them to engage.
- A** Executive orders can be rescinded by succeeding executives – nothing is set in stone. If have MOU, you have a starting point.
- C** Because we have MOUs in place, Colorado allowed state patrol to fly to Kansas to meet to work on the MOU. That

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can't happen unless there is an MOU or one under development.

**Q** What are the essential features of MOU?

**A** There to accomplish a purpose. Maintain control of movement of products

**Q** What really needs to be in an MOU?

**A** While you are putting it together, describe the authority each entity has. The legal department will need reference/supporting documents, to find the different plans. It should be renewed on regular basis, and the liability piece must be addressed by the legal department.

**C** Because you don't know the exact event or incident, the MOU should be a general umbrella, MOU is good idea. Suggest you work into MOU the foot print of industry. May need MOU to deal with pass-through from other states and it should be tailored to the state's particular needs.

**Q** Is there any value to having federal government presented with the template or suggested inclusions states should consider? What is the federal role in this?

**A** Colorado had to work with tribal governments, addressing going through reservations. An MOU is required.

**C** Tribal role raises the issue to another level.

**C** Answer could be an USAHA template, but it may not be the best option.

**Q** USDA has taken fantastic role in working FAD PREP and SOPs to the point where groups want to cooperate. Encourages states to engage industry.

**A** Also beneficial is the USDA stepping back and allowing states to figure out what they are going to do.

**A** With Colorado, the multi-state partnerships have done a lot of work creating templates. We have taken the templates and customized them.

**A** Working to create MOUs with tribal governments and reservations has helped in developing state plans. .

**A** Tribal MOUs are between sovereign nation and sovereign nation, thus federal government may need to establish these MOUs and then states could use them as templates to create their own MOUs.

Facilitated Discussion: Identify Gaps & Path Forward, Dr. Bob DeOtte and Dr. Jimmy Tickel

## Questions (Q), Answer (A), Comments (C), Discussion Topic (T)

**C** Dr. Sampedro has pushed for more risk analysis because not everything is risk based, nor economics based, nor politics based

**Q** Regarding the financial aspects: who pays for the final disposal? Do insurance companies insure for animal disposal and to what extent?

**A** Carcass disposal is not covered by insurance. The owner probably pays.

**Q** The animal transports are wide-open, are we going to change that? Or is that something that will be addressed in the

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## Questions (Q), Answer (A), Comments (C), Discussion Topic (T)

risk analysis?

**A** We don't really understand what the risk is associated with aerosol. Under very stable atmospheric conditions, it is difficult to see an infectious aerosol dose a kilometer down-wind.

**Q** Will there be any indemnity?

**A** Indemnity is negotiable. Traditionally APHIS has paid for the disposal but it falls very short of covering what the producers are losing.

**C** Another example is the Deepwater Horizon Spill disaster where people were compensated for their losses. Therefore, the agricultural community can expect some offsetting of costs.

**A** There are some options out there to get things started, but after that you would have to depend on the federal government

**Q** Are SOPs available which address the gap in cleaning and disinfection of vehicles?

**A** Cleaning and disinfection is very much a part of the disposal processes. An extremely important part of containment. There are gaps and APHIS is working to close those gaps.

**A** A national symposium will work on addressing cleaning and disinfection.

**C** Logistics issues come into play, numbers of trucks to be disinfected, time it takes, where it should be done, how to control disease spread, risk analysis of potential carriers and locations, etc.

**C** Regarding finances, it is usually on a case-by-case basis, and a herd plan or a flock plan with detail is agreed upon - and signed off by state vets, state and owners -ahead of time.

**C** The plan will outline who is responsible for what, who pays, all written down and agreed upon ahead of time.

**C** Regarding disinfection, in the event of wide-spread outbreak, it is recommended states inventory what disinfection materials are on stock and available.

**C** Preliminary work from research on disinfectants is encouraging. Really need to focus on common disinfection agents used on sites to determine their activity. Need to get data on what is already in use.

**Q** Are the disinfectants and protocols being used at packing plants applicable to rendering plants?

**A** We can extrapolate this because they looked at common surfaces. If activity on this surface and they have similar surface will probably work there as well. You must first remove most of the grime and dirt for the disinfection to work.

**Q** Has the weather been taken into account for cleaning and disinfection?

**A** There are climate/weather associated problems and there's no way to effectively clean and disinfect when it is -10 degrees or there's a big storm.

**C** APHIS has been doing work with freezing during cleaning and washing. There are many issues with that. Findings show that spore forming bacteria survive if hit with high pressure. Looking in to see if that is the case for viruses. Working on a non-freezing, portable wash tunnel being funded by DHS, it is in prototype phase. Currently a mixture is used effective at

# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

## Questions (Q), Answer (A), Comments (C), Discussion Topic (T)

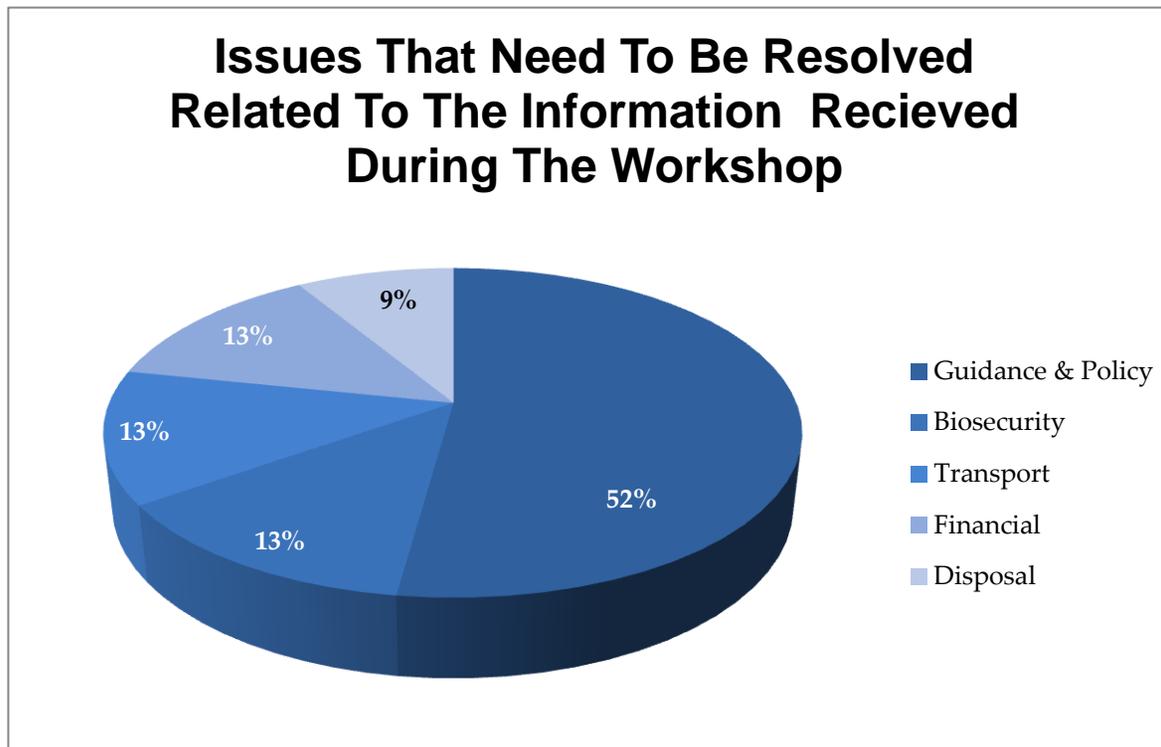
(-25C?) on Exotic Newcastle Disease.

- Q** What about using citric acid?
- A** Citric acid works on porous and non-porous surfaces. Findings were low percent of citric acid 1-2% were effective on viruses. Recommendations issued that it was an effective way to get rid of FMD. Is environmentally mild.
- A** By developing measures including biosecurity, we can overcome the issue of vehicle decontamination when temperature is below a certain level.
- C** Another gap is use of an official FMD test. Chute-side diagnostic is still in development. Confirmation must still come from Plum Island
- Q** Although, there are some developments. How do we handle the false positive problem?
- A** Texas sends about 60-80 samples to Plum Island annually – they are false positive and we have had no problems.
- A** If you have clinical signs you will do more than one thing. The risk analysis is a gap – it is a science technology gap and an education gap, what the American public understands.
- Q** Is Plum Island the only one with a confirmatory test for FMD?
- A** Even with positives from (NAHLN labs) there still must be a verification test from Plum Island.
- Q** It is also a volume issue, not a case issue; once Plum Island has confirmed a positive diagnosis, then NAHLN can test the samples. Actually NAHLN labs certified for FMD can now receive split samples, but must wait for the announcement from Plum Island for the first case.
- C** Biggest gap is FMD vaccine, there is not a lot of vaccine and we will need a lot of vaccine and in a hurry. There is a way to get a lot of vaccine, it will take a lot of money, but not compared to the cost of an outbreak. We need to get Congress to do something.
- C** There is ongoing research using vaccination in sub-clinically infected herds.
- C** Another gap is funding. Whether at state or federal level, our leaders need to understand agriculture is important and some funding needs to be put into place to support the industry
- Q** How do we move forward from here?
- C** We need to find ways to chip away at this.
- Q** North Carolina has an exercise planned. Are there other exercises planned?
- C** RRAP developed biosecurity plans for Texas dairies, feedyards, sale barns, etc. FEMA is supporting an exercise April 2016 to test the products developed under RRAP

# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

## ANNEX C: KEY THEMES BASED ON QUESTIONNAIRE RESPONSES

Question 1: Have You Identified Any Issues You Think Need To Be Resolved Related To The Information You Have Received During The Workshop?



# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

## Actual Participant Responses to Question 1

Theme	Issues
Guidance and Policy	<ul style="list-style-type: none"> <li>• Tackling waste hauling permitting to address bio-waste versus bio-hazardous waste</li> <li>• Mitigating risk associated with one state accepting another state's contaminated carcasses</li> <li>• Training for USDA personnel to properly appraise stock for indemnification</li> <li>• Identifying best choices for carcass management at the various stages of the outbreak</li> <li>• Working with packers, to keep commerce going</li> <li>• Providing options when renderers and landfill operators decline to accept animal carcasses</li> <li>• Identifying responsible parties for depopulating large operations that fall on state lines.</li> <li>• Identifying who sets movement restrictions and who decides movement through Native American lands and territories.</li> <li>• Sharing information developed by the states / groups</li> <li>• Providing USDA materials on carcass management to landfill owners and renderers</li> <li>• Using a mini PDA (in lieu of VS Form 1-27) to scan animals; loading info to a spreadsheet, and then downloading to EMRS at the ICP</li> <li>• Using a mobile app for EMRS 2 for accessibility during field efforts</li> </ul>
Biosecurity	<ul style="list-style-type: none"> <li>• Training haulers in procedures in case of an accident</li> <li>• Enhancing 'slaughter plant' biosecurity, for controlled slaughter of animals received from positive herds</li> <li>• Using leak proof transport</li> <li>• Noting that roll off containers may not be suitable for transportation; many have tears and bent metal, that will rip liners; tailgates are not sealable</li> </ul>
Transport	<ul style="list-style-type: none"> <li>• Coordination of routes with DOT personnel</li> <li>• Coordination of route calculations with local DoT personnel</li> <li>• Clarifying the transport/ shipping regulations to move hazardous waste</li> </ul>

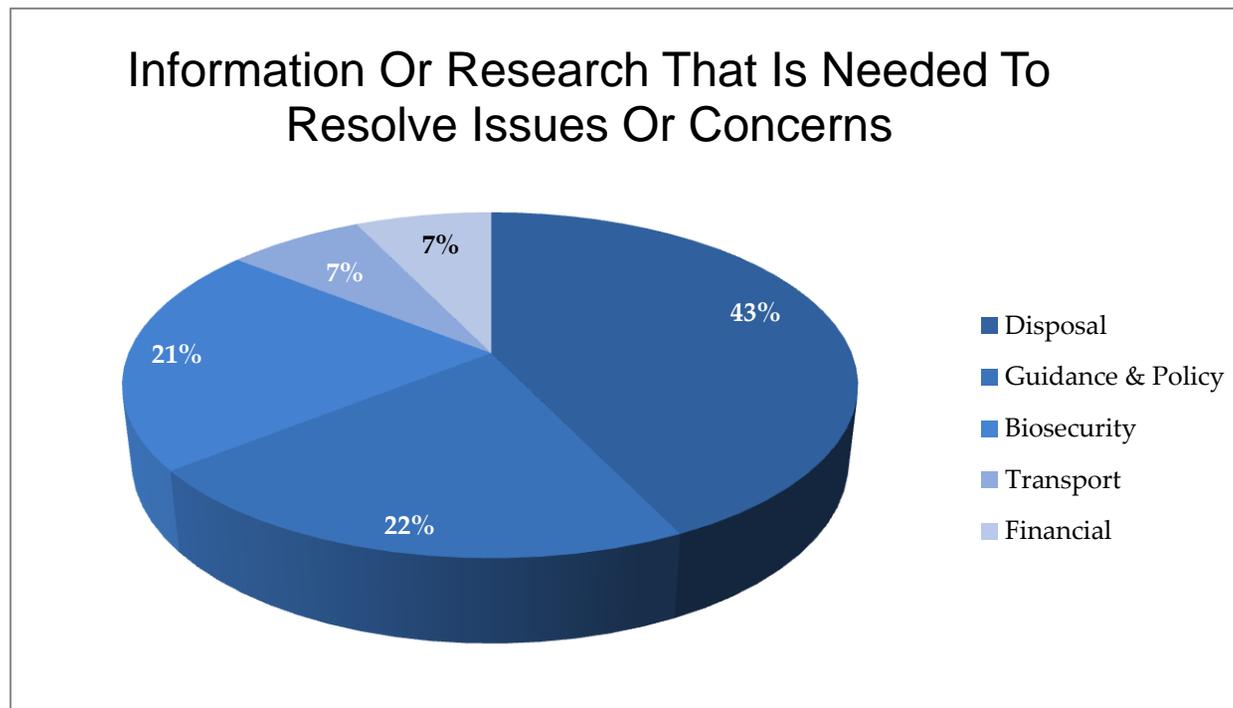
# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

Theme	Issues
Financial	<ul style="list-style-type: none"> <li>• What is the monetary compensation, if a state allows diseased animals / or carcasses to be transported across its highways and the disease spreads?</li> <li>• Address ownership of the animals as they move to slaughter or disposal</li> <li>• Need to ask industry, who needs to own the animals upon leaving the farms. Will industry accept risk?</li> </ul>
Disposal	<ul style="list-style-type: none"> <li>• Need to bring in composting experts (e.g., Cornell, Iowa State, University of Missouri)</li> <li>• How many teams and for what period of time are they needed to dispose of animal populations?</li> </ul>
Other*	<ul style="list-style-type: none"> <li>• Public perception of FMD as a human pathology because of association of FMD with pediatric foot and mouth disease. Need to change name back to Hoof and Mouth Disease</li> <li>• Need to finalize the North Carolina calculator now</li> <li>• Set the threshold numbers to determine stamping-out and add information to the 'Red Book'</li> <li>• Ensure attendees have access to the tools presented</li> <li>• Would like to see true buy-in of using alternatives to stamping out</li> </ul>

*\* The Other category consists of comments that were captured from participants in the survey, but will not be reviewed further in the context of this topic.*

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Question 2: Is There Any Information Or Research You Believe Is Needed To Resolve Issues Or Concerns You May Have?



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## Actual Participant Responses to Question 2

Theme	Information or Research	
Disposal	<ul style="list-style-type: none"> <li>• Need to address environmental factors such as weather and how they affect disease transmission, decontamination, etc.</li> <li>• Consider the possibility of mobile rendering stations</li> <li>• Review lessons learned from countries that have dealt with FMD</li> <li>• Evaluate ocean disposal for coastal states</li> <li>• Recognize the importance of slitting the bio-bags prior to burial</li> <li>• Evaluate the 'kill method' and its effect on virus concentration; identify the preferred method for cattle or swine</li> <li>• Identify the environmental effects of mass animal disposal</li> <li>• Determine containment materials (e.g., plastic) needed</li> <li>• What is the ratio of MSW to animal carcasses in landfills</li> <li>• Determine the national capacity options- by states- for renderings, slaughter, carbon composition, trucks, and landfills</li> <li>• Consider use of a mobile slaughter system at the feedyards; then consider transport to freezers to await disposal options</li> <li>• Testing the bio-bags with large animal carcasses and a variety of conveyances</li> </ul>	
	<ul style="list-style-type: none"> <li>• Change classification of carcasses from hazardous waste</li> <li>• Obtaining a legal opinion regarding indemnification and ownership</li> <li>• Looking at making the live animals (secure beef) to slaughter channels- leverage the normal movements- not a food safety risk</li> <li>• Integrating more classification options for transfer/transport of carcasses-other than hazardous waste. Infectious? Bio Waste? Medical waste?</li> <li>• Identifying government entity responsible for the classification of the carcasses. Federal? State?</li> <li>• Dynamics /timing of models need to be expanded / improved</li> </ul>	
	Guidance and Policy	<ul style="list-style-type: none"> <li>• Determine the number of wash stations needed based on number of vehicles, trips, etc.</li> <li>• Potential contamination during transportation</li> <li>• Investigate or research the possibility of aerosolization of FMD during transport</li> <li>• More research needed to better understand needed medical management of an infected herd. What are the best actions for recovery, limiting virus shed, for segmenting feedyard, and for reducing the carcass load</li> </ul>
		Biosecurity

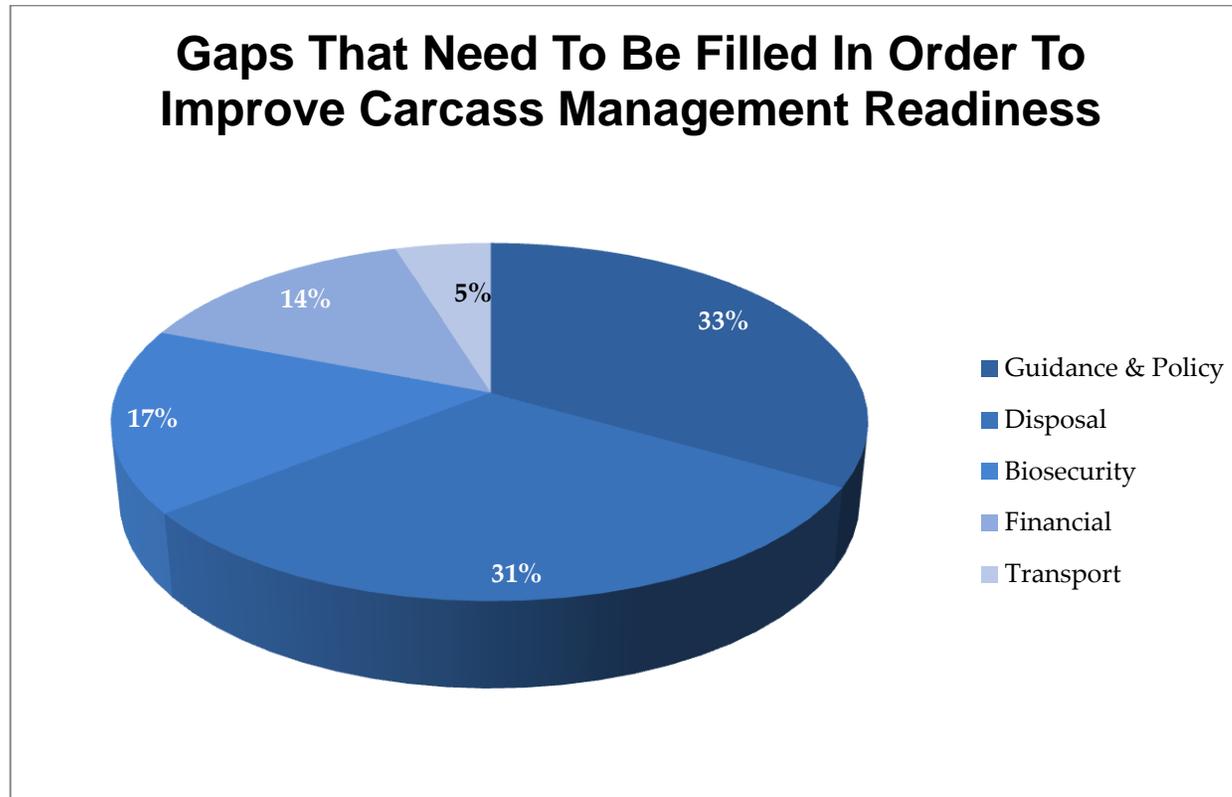
# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

Theme	Information or Research
Transport	<ul style="list-style-type: none"> <li>for transport</li> <li>• Need confirmation that movement of diseased animals or carcasses will not spread the disease</li> <li>• Risk assessment data do not take into account seasonal, geographical, environmental, or weather aspects</li> <li>• Research needed to determine proper C&amp;D of rendering plants, if used to dispose of contaminated carcasses</li> <li>• Develop a live animal movement vehicle, with liner and seal</li> <li>• Consider employing medical waste haulers to move animal carcasses</li> </ul>
Financial	<ul style="list-style-type: none"> <li>• Determining who is ultimately responsible for animal welfare</li> <li>• Need financial / economic analysis for all aspects of details/decisions in the carcass management process</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Provide the presentations (and link to resources) to the workshop attendees</li> <li>• USDA needs to better communicate research requirements and opportunities to academia</li> </ul>

*\*The Other category is comments that were captured from participants in the survey, but will not be reviewed further in the context of this topic.*

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Question 3: Do You See Any Gaps That Need To Be Filled In Order To Improve Carcass Management Readiness?



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## Actual Participant Responses to Question 3

Theme	Gaps
Guidance and Policy	<ul style="list-style-type: none"> <li>• Streamlining EMRS website and making it available on tablets and smartphones for field units</li> <li>• Guidelines for the decontamination/cleaning for rendering plants</li> <li>• Mechanism to share information between states on a national level (MOUs, SOPs, other resources)</li> <li>• Improving partnerships with DOTs, and State Police</li> <li>• Available vaccine to coincide with depopulation efforts with large herds</li> <li>• Additional work to identify the psycho-social effects of a large scale depopulation</li> <li>• How to handle hazardous biomass (e.g., radiation, similar to the Fukushima Daiichi nuclear disaster)</li> <li>• Models of MOAs and MOUs, for accepting animals (both dead or alive)</li> <li>• MOUs between APHIS &amp; tribes for movement of animals</li> <li>• Are there truck washing SOPs, list of equipment and capacities, including number of personnel required for truck washing?</li> <li>• Any MOU drafted by the state animal health agencies must coordinate with the other 10-20 agencies in the state</li> <li>• Local, state, territorial, and tribal governments are encouraged to prepare by developing Animal Carcass Management Plans- as addendum or annex. See FEMA policy 9580.206</li> <li>• Identify the trigger point at which 'stamping out' becomes 'vaccinate to kill' and identify how the shift occurs</li> <li>• USDA needs to train more appraisers -so that producers have their value of indemnity quickly, in order to begin depopulation / disposal w/in the first 24 hours</li> </ul>
Disposal	<ul style="list-style-type: none"> <li>• Need dynamic modeling capability during outbreaks- to determine optimal /best option for disposal</li> <li>• What is the current process for handling deep pits for swine manure?</li> <li>• What is the availability of Bio-Zip bags and associated costs?</li> <li>• Need more information on composting</li> <li>• Is lactic acid fermentation a solution for large scale disposal? See Kansas State study, Aug 04</li> <li>• Inclusion of the disposal industry (i.e., landfill operators) to gain their perspective and input for response to a disposal event</li> <li>• Develop plans for organizing composting efforts</li> <li>• Strategically place tools needed for mass carcass disposal</li> <li>• Can a national database be built of available composters?</li> </ul>

# NATIONAL WORKSHOP ON CARCASS MANAGEMENT LOGISTICS

Theme	Gaps
Financial	<ul style="list-style-type: none"> <li>• Investigate possibility of mobile rendering facilities, available at strategic locations</li> <li>• For coast states, is ocean disposal a possibility</li> <li>• Review overall multistage disposal issues</li> <li>• Communication with privately owned landfills and renderers – to prepare statements of work contracts to allow disposal of carcasses in a large event</li> <li>• Funding sources made available</li> <li>• Determining who pays for disposal? Are large producers required to have insurance coverage for carcass disposal?</li> <li>• Define ownership of the carcasses. After the owner is indemnified, then who owns the livestock?</li> <li>• Who pays for handling and disposal costs at the landfill?</li> <li>• Determine ownership of animal carcasses in a FAD response.</li> <li>• Determine funding sources for FAD planning and prevention</li> </ul>
	<ul style="list-style-type: none"> <li>• How to manage carcasses with a zoonotic disease</li> <li>• Enhanced surveillance</li> <li>• Way to move live animals without potentially spreading the disease</li> <li>• Landfill and transport workers concerns with zoonotic disease</li> <li>• Zoonotic disease (w/carcass disposal) and exposure of drivers or other personnel</li> <li>• Pork producers have taken the lead on transportation biosecurity (Trucker QA Program). Great source for trucker biosecurity information &amp; knowledge.</li> <li>• Need additional risk analysis studies, similar to UMN work; need to partner with other groups to get science or data from countries experiencing outbreaks.</li> </ul>
Transport	<ul style="list-style-type: none"> <li>• Decontamination of vehicles, lining and other leakage protection, regulations, etc.</li> <li>• Engage DOT and Highway Patrol groups in these discussions, to identify bottle necks in transport of carcasses. Must include C&amp;D, availability of personnel and supplies/equipment</li> </ul>
Other	<ul style="list-style-type: none"> <li>• -OIE rules need to change, otherwise the US will continue 'stamping out' policy to regain FMD free status</li> <li>• -When will the map &amp; calculator become available for use?</li> <li>• -USA needs to become a model international trading partner (e.g., with countries using vaccination) in the event the US experiences FMD and resorts to vaccination</li> </ul>

*\* The Other category is comments that were captured from participants in the survey, but will not be reviewed further in the context of this topic.*

## ANNEX D: POST WORKSHOP SURVEY RESULTS

An online questionnaire targeting the workshop objectives was administered by West Texas A&M University using Survey Monkey™. The questionnaire was sent to 75 participants and 51 participants responded to the questionnaire for a response rate of 68%.

A comprehensive analysis of the results is available. Please contact Dr. Bob DeOtte for more information.

**West Texas A&M University**

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