
ANIMAL DISEASE OUTBREAK EMERGENCY RESPONSE LOGISTICAL INFRASTRUCTURE PROJECT

CONSOLIDATED FINAL REPORT



CUBIC



NORTH CAROLINA DEPARTMENT
OF AGRICULTURE AND
CONSUMER SERVICES

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Animal Disease Outbreak Emergency Response Logistical Infrastructure Consolidated Report

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EXECUTIVE SUMMARY

The Animal Disease Outbreak Emergency Response Logistical Infrastructure project was conducted through an inter-agency agreement by the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) for United States Department of Homeland (DHS) Security Science and Technology Directorate (S&T) Chemical and Biological Division Agricultural Defense Branch.

The goal of the Logistical Infrastructure project was to identify gaps related to logistical considerations for a foreign animal disease outbreak in the five-state region of the Midwestern U.S. (portions of Texas, Oklahoma, Colorado, New Mexico, and Kansas) and North Carolina. The purpose of this report is to consolidate the findings from the principal performers, North Carolina Department of Agriculture and Consumer Services (NCDA&CS) and West Texas A&M University (WTAMU).

Both NCDA&CS and WTAMU co-led an effort to develop a set of recommendations pertaining to the logistical issues of transporting, permitting movement, and disposing of livestock carcasses during a foreign animal disease outbreak. The performers also focused on the resources currently available to address a large-scale livestock emergency, such as the capacity of landfills, renderers and cold storage warehouses in the five-state area.

Additionally, NCDA&CS and WTAMU partnered with other states and the swine, dairy, and poultry industries to address capability gaps. Partners included University of Minnesota Center for Animal Health and Food Safety, Texas Transportation Institute, Texas Animal Health Commission, California Department of Food and Agriculture, Minnesota Department of Agriculture, Iowa Department of Agriculture and Land Stewardship, and Wisconsin Department of Agriculture, Trade and Consumer Protection.

A series of stakeholder workshops, webinars and conferences were held throughout the program. These events were held to encourage dialogue and obtain input from industry stakeholders including livestock producers, dead-stock haulers, landfill operators, rendering facility operators, academia, and law enforcement.

SIGNIFICANT FINDINGS

The performers found that there is no federal regulation which specifically addresses the movement of mass numbers of infected carcasses in the event of a Foot and Mouth Disease (FMD) outbreak.

Most, if not all, state animal disposal statutes only mention routine animal deaths and do not address the disposal of a large quantity of FMD- infected biomass..

On-site disposal during an FMD outbreak might not be a viable option for feedyards due to the large number of animals involved. Highway transport is often necessary in the event a state's disposal resources are overwhelmed during an animal disease

outbreak, or if weather or environmental conditions prevent carcasses from being disposed of on-site via burial or composting. Highway transport would most likely be the preferred transport option in the event of a disease outbreak causing mass mortalities.

Based on the proposed mitigations in the Risk Assessment, the authors concluded that the likelihood of exposure to FMDv by susceptible populations during the movement of infected carcasses is negligible.

The number of animals that can be disposed of in a landfill or rendering facility in a short period is limited by operational constraints. It is unlikely that landfills would be willing to commit total capacity to carcass management, so even the reported capacity is not available for emergency response to a livestock event.

RECOMMENDATIONS

Given the lack of federal regulations that address transporting bulk infectious materials, it is recommended that USDA coordinate with the U.S. Department of Transportation (USDOT) to specifically identify requirements and methods for transporting bulk infected animal carcasses in the event of an animal disease outbreak. The performers recommend that requirements follow USDA guidelines for transporting bulk infected carcasses, and at a minimum should include a sealed, leak-proof conveyance.

Performers recommend that states develop a plan for transporting infected carcasses for disposal. In addition to transport and disposal, plans should also address sale, stop-movement, quarantine, and the possibility of intrastate movement of infected carcasses from other states.

Performers recommend that states develop interstate and regional agreements with landfill and rendering locations, and neighboring states as part of their emergency plans. These agreements, memorandums of understanding, and jurisdictional agreements should be established prior to a disease outbreak.

Performers recommend that the conveyance used to transport FMD-infected carcasses must be leak-resistant and covered throughout transport. Such as a rendering truck with a sealed tailgate, roll off or dump truck with tarp cover and a Bio-Zip™ or similar bag to contain the carcasses.

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this Logistical Infrastructure Consolidated Report is to consolidate the findings from the High Plains study conducted by West Texas A&M University (WTAMU), and the North Carolina study conducted by the North Carolina Department of Agriculture and Consumer Services (NCDA&CS), and make comprehensive recommendations based on the overall findings for transport parameters, bulk transport regulations, advance general permits, optimal disposal capacity and a risk assessment.

1.2 Background

The Animal Disease Outbreak Emergency Response Logistical Infrastructure project was conducted by the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) for the U.S. Department of Homeland (DHS) Security Science and Technology Directorate (S&T) Chemical and Biological Division Agricultural Defense Branch. DHS is committed to using cutting edge technologies and scientific talent to make America safer. The DHS S&T is tasked with researching and organizing the scientific, engineering and technological resources of the U.S. and leveraging these existing resources into technological tools to help protect the homeland.

As identified in Homeland Security Presidential Directives (HSPDs) on Defense of United States Agriculture and Food (HSPD-9) and Biodefense for the 21st Century (HSPD-10), mechanisms for protection of critical infrastructure are fundamental components as part of any comprehensive strategy for biodefense. Focused development and deployment of technologies to foster proactive protection, response and recovery is necessary to protect against any significant infectious disease threat. In the case of high-consequence livestock pathogens, these tools play a crucial role in the preventative, mitigation and recovery phases of an outbreak.

USDA APHIS is the lead Federal response agency in the event of an animal disease outbreak under Homeland Presidential Directive 9, Emergency Support Function 11. As such, APHIS has identified a number of research priorities related to animal disease emergency response capability gaps. The Animal Disease Outbreak Emergency Response Logistical Infrastructure project was conducted through an interagency agreement between DHS S&T and USDA APHIS. The Logistical Infrastructure project aimed to identify gaps related to logistical needs in case of a disease of large animals in the Midwestern U.S. (portions of Texas, Oklahoma, Colorado, New Mexico, Kansas, and Nebraska). Addressing these gaps will enable APHIS to more effectively respond to a foreign animal disease outbreak in the U.S., should one occur.

WTAMU and the NCDA&S worked in collaboration through a cooperative agreement to perform research in support of the Logistical Infrastructure Project.

The work performed by WTAMU for USDA APHIS was focused on issues related to a potential large animal disease outbreak response in cattle feeding operations in the Midwest. The WTAMU report findings include the following elements;

- *Risk Assessment for the Transmission of Foot and Mouth Disease (FMD) via Movement of Swine and Cattle Carcasses from FMD-infected Premises to a Disposal Site* - University of Minnesota Center for Animal Health and Food Safety (UMN CAHFS) developed a risk assessment addressing the risk of moving cattle and swine carcasses to potentially infect other susceptible livestock species on other premises. The risk assessment is based on current information and describes movement guidelines, the results would be a baseline of which decisions on mitigations of risk could be made. Referred to as "Risk Assessment" in this document.
- *Transportation Planning Issues Associated with Mass Disposal of Large Animal Carcasses* – the Texas A&M Transportation Institute researched the regulatory requirements and transportation issues for disposal of large animal carcasses following a highly infectious animal disease outbreak. Referred to as "Transportation Study" in this document.

The work performed by NCDA&CS focused on issues related to a potential livestock disease outbreak response in the North Carolina swine production region.

A summary of findings and recommendations from this report can be found in Section 8.0. Performer report references are located in Appendix A and the acronyms and glossary is in Appendix B.

2.0 TRANSPORT PARAMETERS

This task involved developing a detailed set of guidelines and best practices for transporting large animal carcasses from a quarantine zone to a disposal site. The following elements were considered:

2.1 Regulations

2.1.1 Requirements

This subtask required the performers to review all applicable local, state and federal regulations and document applicable regulatory requirements.

2.1.2 Activities Performed

The investigators in each study area conducted a review of federal and state transportation regulations concerning the movement of cattle carcasses infected with FMD and an examination of existing emergency transportation protocols for diseased cattle carcasses to determine how/if they can be applied to an animal health emergency response.

The federal regulations that were reviewed included USDA regulations on quarantine, and interstate movement of diseased animals and poultry, as well as Department of Transportation regulations related to the movement of infected materials in commerce.

In addition, state regulations concerning the transportation or movement of diseased livestock carcasses were examined from the states of; Colorado, Kansas, Nebraska, New Mexico, North Carolina, Oklahoma, and Texas.

2.1.3 Findings

2.1.3.1 The performers found that there is no federal regulation which specifically addresses the movement of mass numbers of infected carcasses in the event of an FMD outbreak.

2.1.3.1.1 Title X Subtitle E of the Animal Health Protection Act describes the authority of the Secretary of the U.S. Department of Agriculture and the rules the Secretary can implement during a disease event or to prevent a disease event. It gives the Secretary the authority to prohibit or restrict interstate movement to prevent the spread of disease. It also gives the Secretary the authority to take action in a state if the measures taken by the state are inadequate to control the spread of disease. These rules could impact off-site and intrastate transport of a state's carcass management plan, and could potentially invalidate Interjurisdictional agreements and or memorandums of understanding between states.

- 2.1.3.1.2 9 CFR § 71.2 states that the Secretary of Agriculture will issue a rule governing quarantine and interstate movement of diseased animals that will either “absolutely forbid” the interstate movement of the quarantined animals, or will outline the regulations “under which interstate movements may be made.”
- 2.1.3.1.3 Furthermore, 9 CFR § 71.3 states that animals affected with certain diseases endemic to the United States and certain diseases that are not known to exist in the United States, such as Foot and Mouth Disease (FMD) “shall not be moved interstate.” This statute does not address whether or not the Secretary of Agriculture can enable interstate movement if needed for carcass management during a disease outbreak.
- 2.1.3.1.4 9 CFR § 325.20 restricts the transportation of dead or diseased livestock that died otherwise than by slaughter, unless such livestock and parts are consigned and delivered, without avoidable delay, to registered establishments of animal food manufacturers, renderers, or collection stations
- 2.1.3.2 The performers found that no federal regulations provide specific guidelines for the bulk transport of diseased animal carcasses for carcass management.
 - 2.1.3.2.1 49 CFR § 171.1 (d) (5) addresses US Department of Transportation (USDOT) authorities and requirements to move hazardous materials in commerce. This section indicates certain non-commercial movements of hazardous materials are not subject to the federal Hazardous Materials Regulations (HMR). Specifically it states that “transportation of a hazardous material in a motor vehicle, aircraft or vessel operated by a Federal, state, or local government employee solely for non-commercial Federal, state, or local government purposes” is not subject to the HMR. In addition, 49 CFR § 171.1(d)(6) states that “transportation of a hazardous material by an individual for non-commercial purposes in a private motor vehicle, including a leased or rented motor vehicle” are also exempt from complying with federal HMR. As a result, depending on the transportation options chosen, the operations for handling of the study scenario may not be strictly subject to the federal HMR.
 - 2.1.3.2.2 49 CFR § 172 establishes the requirements for packaging, labeling and placarding of transport vehicles for the shipment and transportation of hazardous materials. This statute applies to transportation by air, highway, rail, or water. CFR 49 § 173.134 (6) (6.2) classifies FMD as an infectious substance (affecting animals

only) and the packaging requirements and quantity limitations identified in 49 CFR § 172 only addresses the shipment of specimens or samples via air and vessel, and not the transportation of bulk materials – such as livestock carcasses.

2.1.3.2.3 49 CFR § 175 describes the requirements for the transportation of hazardous materials aboard aircraft. This statute does not address the requirements for transporting FMD-infected carcasses as cargo.

2.1.3.3 Most, if not all, state animal carcass management statutes are primarily focused upon routine animal deaths of one to a few animals and do not address the management of a large quantity of FMD- infected carcasses.

2.1.3.3.1 The majority of states evaluated by the performers selected rendering as their preferred carcass management method. Rendering facilities in each state have limited capacities that might not meet the carcass management needs during a mass-mortality event, requiring states to consider other options or transport to carcass management facilities out of state.

2.1.3.3.2 Depending on the scale of the animal disease outbreak, on-site carcass management options such as composting and burial might not be sufficient and off-site transportation will be required for carcass management.

2.1.3.3.3 Establishing emergency carcass management plans, rates, and agreements with landfill and rendering locations within the multi-state region is paramount as it will not be done as effectively quickly or on an ad hoc basis.

2.1.3.3.4 The plans and agreements developed by states pre-outbreak might need to be revised based on the dynamics and movement restrictions of a particular disease outbreak.

2.1.3.3.5 During the workshops held during the course of this project, there was much discussion on how collaborative agreements and plans with other states may or may not be recognized during an animal disease outbreak. States have the authority to approve or disapprove movement through their state which could invalidate or impact collaborative agreements with other states.

2.1.3.3.6 The overall preference for workshop participants was that any bulk transport of infected carcasses be under the oversight of USDA, as lead agency responsible for the event.

2.1.4 Recommendations

- 2.1.4.1 Any best practices or plans developed as a result of this project should anticipate and identify a contingency plan for a ruling issued by the Secretary which may or may not allow for the transport of diseased carcasses.
- 2.1.4.2 Given the lack of federal regulations that address transporting bulk infectious materials, it is recommended that USDA coordinate with the USDOT to specifically identify requirements and methods for transporting bulk infected animal carcasses in the event of an animal disease outbreak. The performers recommend that requirements follow USDA guidelines for transporting bulk infected carcasses, and at a minimum should include a sealed, leak-proof conveyance. More detailed recommendations can be found in Section 2.2 of this report.
- 2.1.4.3 Develop a plan for transporting infected carcasses for management. In addition to transport and carcass management, plans should also address sale, stop-movement, quarantine, and the possibility of intrastate movement of infected carcasses from other states.
- 2.1.4.4 Develop interstate and regional agreements with landfill and rendering locations, and neighboring states as part of their emergency plans. These agreements, memorandums of understanding, and jurisdictional agreements should be established prior to a disease outbreak.

2.2 Types of Vehicles

2.2.1 Requirements

This subtask required performers to evaluate pros and cons of vehicle type options such as lined roll-offs and intermodal containers. Other factors for consideration were vehicle capacity, the need for liners and/or covers, and ease of cleaning. Performers were asked to make recommendations for what type of vehicle is best under various circumstances.

2.2.2 Activities Performed

The investigators evaluated the suitability and benefits of different types of vehicles designed for transporting carcasses. Based on this information, they commissioned a Risk Assessment to identify the risk associated with transporting carcasses using different types of conveyances and equipment. Performers in each study area evaluated three types of trucks; rendering truck, roll-off truck, and dump truck. The characteristics, types of conveyance methods, and equipment used to transport the infected carcasses were also provided from expert opinion and verified through site visits.

2.2.3 Findings

- 2.2.3.1 Rendering Truck – Some rendering trucks have hard tops and some render haul vehicles have open / uncovered tops. The risk of FMD infection of susceptible livestock associated with the movement of swine and cattle carcasses from FMD infected premises to a carcass management site during a FMD outbreak in the United States when using a standard rendering truck (sealed tailgate), a tarp cover and Bio-Zip™ bag is negligible. The risk is also negligible when just using a Bio-Zip™ Bag without a tarp covering. Using a standard rendering truck with only a tarp covering has low risk of FMD infection of susceptible livestock, and there is a moderate risk when using an uncovered standard rendering truck.
- 2.2.3.2 Roll-off Truck - The risk of FMD infection of susceptible livestock during transport of FMD carcasses when using a roll-off truck (not sealed or leak-proof) with liner, tarp covering and a Bio-Zip™ bag or just a tarp and Bio-Zip™ bag is negligible. The risk level using just a tarp covering and liner is low to moderate. The risk associated with using a roll-off truck with only a Bio-Zip™ bag is low. Using a roll-off truck with only a liner presents a moderate to high level of risk.
- 2.2.3.3 Dump Truck – The risk of FMD infection of susceptible livestock when transporting carcasses in a dump truck (not sealed or leak-proof) with liner, tarp covering and a Bio-Zip™ bag or just a tarp and Bio-Zip™ bag is negligible. The risk level using just a tarp covering and liner is low to moderate.

The risk associated with using a dump truck with only a Bio-Zip™ bag is low. There is a moderate to high level of risk with transporting infected carcasses in a dump truck with only a liner.

2.2.4 Recommendations

- 2.2.4.1 The performers recommend that strict adherence to specific biosecurity parameters is maintained to reduce the risk of spreading FMD. Specifically, the conveyance must be leak-resistant and covered throughout transport.
- 2.2.4.2 The recommended type of vehicles to transport FMD-infected carcasses are a rendering truck with a sealed tailgate, roll off or dump truck with tarp cover and a Bio-Zip™ or similar bag to contain the carcasses.

2.3 Transport Methods

2.3.1 Highway Transport

2.3.1.1 Requirements

This subtask required the performers to consider the merits and constraints of highway transport, along with recommendations and conditions for use of transport.

2.3.1.2 Activities Performed

The transportation of carcasses during a FMD outbreak or mass mortality event was discussed in great detail during all of the workshops held throughout the project, Highway transport was also addressed in the Risk Assessment and Transportation Study.

2.3.1.3 Findings

- 2.3.1.3.1 On-site carcass management during an FMD outbreak might not be a viable option for feedyards due to the large number of animals involved. Highway transport is often necessary in the event a state's carcass management resources are overwhelmed during an animal disease outbreak, or if weather or environmental conditions prevent carcasses from being disposed of on-site via burial or composting.
- 2.3.1.3.2 Highway transport would most likely be the preferred transport method in the event of a disease outbreak causing mass mortalities;
 - 2.3.1.3.2.1 The livestock industry already utilizes highway transport and specially-equipped for disposing of routine mortalities at rendering facilities and landfills.
 - 2.3.1.3.2.2 Highway transport is widely accepted as the most feasible and biosecure transport method, rendering trucks are leak-resistant and have a sealed tailgate as required by federal law.
 - 2.3.1.3.2.3 The USDA has established guidelines for decontaminating trucks.
 - 2.3.1.3.2.4 Compared to other transport methods, it would take the least amount of resources to adapt existing highway transport regulations to accommodate the requirements of mass livestock management.

2.3.1.4 Recommendations

- 2.3.1.4.1 Use highway transportation as the preferred method of transport because it is already regulated and commonly used for routine carcass management. In addition, transporting by a single method (use of the highway system) decreases handling and the risk of spreading pathogens through trans-loading onto a ship, aircraft or train.

2.3.1.4.2 The USDA in conjunction with USDOT issue clear guidance regarding bulk transport of diseased animal carcasses, see Section 2.1.4.2.

2.3.2 Rail Transport

2.3.2.1 Requirements

This subtask required the performers to consider the merits and constraints of rail transport along with recommendations and conditions for use of transport.

2.3.2.2 Activities Performed

On April 25th, 2012 research team members from the Texas Transportation Institute (TTI) met with officials of the BNSF Railway at the BNSF Railway Headquarters in Fort Worth, Texas to discuss the issues and possibilities surrounding railroad transport of diseased cattle carcasses following an outbreak in a high density feedlot in the High Plains area.

2.3.2.3 Findings

- 2.3.2.3.1 Current viewpoints from the rail industry are that any movement of infected carcasses would negatively affect the industry; therefore, rail companies are not interested in partnering to explore rail transport solutions.
- 2.3.2.3.2 Due to the limited number of rail loading facilities, carcasses must be transported by highway to the rail facility.
- 2.3.2.3.3 Specialized equipment and a properly configured transfer area are required to transfer contents or containers from the truck and load onto the rail cars.
- 2.3.2.3.4 The rail industry is concerned about liability issues associated with inadvertent leachate leakage.
- 2.3.2.3.5 Rail could possibly be more usefully employed in an emergency to move in outside equipment (e.g. trucks, cold storage, mobile incinerators, etc.) or fuel for on-site burning if wood or other fuel for doing so is scarce.
- 2.3.2.3.6 The military has some rail infrastructure and assets such as, equipment, people, resources, and protocols. Use of military rail assets may present less liability than the use of commercial rail.
- 2.3.2.3.7 Federal regulations do not address bulk transport of carcasses for transport via railway.

2.3.2.4 Recommendations

- 2.3.2.4.1 Performers do not suggest rail as a feasible transportation method due to the reluctance from the railroad industry, limited number of rail loading facilities, resources required, and biosecurity concerns.
- 2.3.2.4.2 Performers recommend that rail be considered as a means to bring in equipment during a mass livestock mortality event rather than a means for carcass transport.

2.3.2.4.3 Performers recommend each state investigate use of military rail facilities and personnel if applicable.

2.3.3 Air Transport

2.3.3.1 Requirements

This subtask required the performers to consider the merits and constraints of air transport, along with recommendations and conditions for use of transport.

2.3.3.2 Activities Performed

Performers evaluated air transport as a potential transport method by examining federal regulations and assessing its feasibility for bulk transport of infected carcasses.

2.3.3.3 Findings

- 2.3.3.3.1 The performers found that the regulatory guidance pertaining to air transport limits the quantity of infectious substances affecting animals to medically packaged samples of the FMD virus. None of the federal regulations concerning air transportation specifically authorize or address the transport of large quantities of infected carcasses.
- 2.3.3.3.2 The use of air transport would require the transport of carcasses by highway transport to the airport, and involve the transfer of contents or using containers that can be loaded as cargo.
- 2.3.3.3.3 Unloading and loading of containers would require specialized equipment and personnel.
- 2.3.3.3.4 Due to the size of the aircraft required to transport large containers as cargo, decontamination would be expensive and time consuming.
- 2.3.3.3.5 Air transport is significantly more expensive than highway transport due to the resources and personnel required to maintain and operate the air craft.

2.3.3.4 Recommendations

- 2.3.3.4.1 Performers do not recommend air transport for infected carcasses due to cost, resources and biosecurity concerns.

2.3.4 Ship Transport

2.3.4.1 Requirements

This subtask required the performers to consider the merits and constraints of ship transport, along with recommendations and conditions for use of transport.

2.3.4.2 Activities Performed

Performers evaluated ship transport as a potential transport method by examining federal regulations and assessing its feasibility for bulk transport of infected carcasses.

2.3.4.3 Findings

- 2.3.4.3.1 The performers found that the regulatory guidance pertaining to ocean transport of infectious substances such as the FMD virus limits the size of the vessel and stowage location. However, the regulatory guidance for ocean transport does not specifically authorize or address the transportation of large quantities of infected carcasses on ships.
- 2.3.4.3.2 Ocean transport is not considered a primary transportation method for carcasses due to highway transport being a necessary requirement to move carcasses from a feedyard to a port of embarkation/debarkation.
- 2.3.4.3.3 The majority of feedlots and carcass management facilities are not located near the ocean.
- 2.3.4.3.4 The use of ocean transport would involve the transfer of contents or using containers that can be loaded from the truck onto the ship as cargo.
- 2.3.4.3.5 Due to the size of the vessel required to transport large containers as cargo, decontamination would be expensive and time consuming.

2.3.4.4 Recommendations

- 2.3.4.4.1 Performers do not recommend ship transport for carcasses because of the distance of feedlots from ports, increased decontamination requirements, time constraints and biosecurity concerns.
- 2.3.4.4.2 Performers recommend determining if Federal regulations need to be expanded to address restrictions or guidelines for bulk transportation of infected carcasses via ship in the event this transport method is needed during an animal disease outbreak.

2.4 Decontamination Options

2.4.1 Requirements

This subtask required performers to evaluate decontamination options by conducting a literature review, gap analysis, and identifying recommendations for best practices. Performers were to consider both exterior vehicle decontamination during shipping and final decontamination after outbreak containment.

2.4.2 Activities Performed

Cleaning and decontamination procedures for vehicles were discussed during the Des Moines, IA and Kansas City, MO workshops and were also evaluated during preparation of the Risk Assessment.

2.4.3 Findings

- 2.4.3.1 Decontamination operations would need to take place in a disease event.
- 2.4.3.2 The USDA FAD PReP Guidelines and Standard Operating Procedures (SOP) are already in use by the livestock industry, transport industry, and state and local animal health officials.
- 2.4.3.3 The perception of the cleanliness of livestock and animal processing facilities will affect domestic and international markets.
- 2.4.3.4 The use of decontamination procedures, proper PPE, trained personnel and the need for adequate space for loading and decontamination as described in APHIS and DHS manuals make transport of carcasses a complex, logistical task requiring significant resources and personnel.

2.4.4 Recommendations

- 2.4.4.1 The performers recommend that cleaning and disinfection during an animal disease outbreak should follow USDA FAD PReP Guidelines and SOPs for disinfection of vehicles, equipment, and people.
- 2.4.4.2 Carcasses should be placed in a conveyance suitable for transport over highways. The conveyance should have a leak-resistant tailgate that will prevent liquids from escaping.
- 2.4.4.3 The carcasses should be pretreated with a suitable disinfectant after placement in the conveyance.
- 2.4.4.4 Following pretreatment, a top cover [such as a tarp] should be drawn tightly over the conveyance so there will be no air flow entering the compartment of the carcasses.

- 2.4.4.5 The entire conveyance (which includes trailer and primary mover, if applicable), with top cover in place, should then be moved to a disinfection point and the entire outside of the vehicle and conveyance should be disinfected.
- 2.4.4.6 Decontamination operations should be kept inside control areas to prevent further disease spread.

2.5 Quality Assurance

2.5.1 Requirements

This subtask required performers to evaluate ways to ensure Biosecurity standards are achieved during transport and recommend best practices. Considerations included the feasibility of establishing clean-up standards or performance criteria, and the use of verification procedures such as spot-checking or continuous supervision.

2.5.2 Activities Performed

Participants of the Des Moines, IA workshop addressed quality assurance to mitigate risks associated with disease spread and ensure eradication of the disease during an outbreak.

2.5.3 Findings

None reported.

2.5.4 Recommendations

- 2.5.4.1 Performers recommend signature verification of proper loading and securing of carcasses into an approved transport conveyance for all transport methods (truck, container, trailer, etc.).
- 2.5.4.2 Performers recommend a qualified on-site representative verify (by signature) that all FAD PReP decontamination protocols were followed prior to receiving a transport permit.
- 2.5.4.3 Performers recommend permitting to track all vehicle movements and as a secondary measure to ensure appropriate loading and decontamination procedures are followed.

2.6 Security

2.6.1 Requirements

This subtask required performers to evaluate the need for escorts or other protective measures and recommend and outline best practices.

2.6.2 Activities Performed

Security was debated and discussed at various times throughout the project. During the workshops in Durham, NC and Des Moines, IA the subject was broached with law enforcement, animal health officials, USDOT, and others.

2.6.3 Findings

- 2.6.3.1 Physical security may be required at the loading and unloading facilities due to potential protests among residents or activists.
- 2.6.3.2 Security for transport convoys could attract undesired attention from the public and media.
- 2.6.3.3 Security at loading and unloading locations would likely be a decision of the Incident Management Team (IMT) on scene.

2.6.4 Recommendations

- 2.6.4.1 Project performers recommend that security should be incident specific;
 - 2.6.4.1.1 Security at loading and unloading locations should be managed by the IMT on scene.
 - 2.6.4.1.2 Conveyances should be tracked using the appropriate technology (e.g., GPS, signed manifests) suitable for the needs and based on the Incident Commanders directives.
- 2.6.4.2 The performers recommend following Incident Commander's recommended security measures to mitigate risks to security of personnel at all locations; including loading and unloading locations as well as transporting in between those locations.

2.7 Manifesting

2.7.1 Requirements

This subtask required performers to determine class of waste, and suitability of a standard manifest or the need to develop a more specific manifest.

2.7.2 Activities Performed

The use of manifests when transporting hazardous materials was discussed at the workshops in Durham, NC and Kansas City, MO.

2.7.3 Findings

- 2.7.3.1 Both USDOT and EPA require the use of a Uniform Hazardous Waste Manifest when transporting hazardous materials such as FMD.
- 2.7.3.2 The current Manifest system is a paper document with multiple copies; it does not enable the systematic tracking of the movement of carcasses from the original premises to their final location. However, EPA is in the process of implementing an electronic manifest system which will be available in 2018.
- 2.7.3.3 Creating another layer of bureaucracy/an additional manifest requirement could delay the transport and carcass management process.

2.7.4 Recommendations

- 2.7.4.1 The performers recommend that USDA work with USDOT to develop appropriate manifesting requirements for bulk transport of infected carcasses, if any.
- 2.7.4.2 The Performers recommend amending the Veterinary Services (VS) form 1-27; to include the information collected on a manifest, to allow shipment of carcasses and to allow tracking conveyances moving from infected premises to off-site carcass management facilities.
- 2.7.4.3 Performers recommend using the Emergency Management Response System (EMRS) II, a web-based emergency management tool developed by the USDA in partnership with state agencies to track the shipment of infected carcasses with the VS 1-27 form. This system will automatically link to destination point of contact for interstate movement.

2.8 Placarding

2.8.1 Requirements

This subtask required performers to identify applicable signage and verify with USDOT.

2.8.2 Activities Performed

Using placards, to meet USDOT requirements, when transporting hazardous materials was discussed at the workshop in Kansas City, MO. Placarding was also addressed in the Transportation Study.

2.8.3 Findings

- 2.8.3.1 No USDOT regulations address the bulk transportation of infected livestock carcasses, but do require placarding of vehicles transporting infected carcasses because FMD is hazardous to livestock.
- 2.8.3.2 Participants in workshops were afraid that placards would upset the public, especially transporting carcasses outside of an infected state.
- 2.8.3.3 Mass media messaging could be useful resource in addition to placarding, to communicate information about FMD and its risk to humans and animals.
- 2.8.3.4 Placarding is utilized for everyday transportation efforts by first responders and transportation safety officials in identifying hazardous materials being shipped on roadways, airspace, and shipping lanes.
- 2.8.3.5 Mandatory placarding of conveyances transporting bulk infected livestock carcasses could ultimately delay the disposal process.

2.8.4 Recommendations

- 2.8.4.1 The performers recommend that USDA work with USDOT to develop appropriate placarding requirements for bulk transport of infected carcasses, if any.
- 2.8.4.2 The performers recommend that USDA request that USDOT waive placarding requirements in the event of an outbreak since all vehicles will be inspected, permitted, cleaned, disinfected, and tracked during transport, unless the placard provides another benefit beyond those covered by the permit.

2.9 Interjurisdictional Agreements

2.9.1 Requirements

This subtask required performers to review existing movement control regulations in TX, OK, CO, NC, NE, NM, and KS. Performers were also required to discuss interjurisdictional movements with states, prepare draft agreement language, and obtain stakeholder input through workshops. Topics were to include entry/exit requirements, travel routes, prohibitions, and exceptions. A qualitative risk assessment was performed and is discussed in Section 5.0.

2.9.2 Activities Performed

Investigators in both study areas discussed interjurisdictional agreements with nearby states. Discussions included a meeting in Amarillo, TX in which state veterinarians from NM, TX, OK, KS and CO participated. Despite continuing discussions, no Memorandums of Understanding (MOU) or Agreement (MOA) were adopted during the course of the project.

2.9.3 Findings

- 2.9.3.1 Colorado has MOUs with Nebraska and Kansas for intrastate livestock movement during a presumptive positive or confirmed positive foreign animal disease event.
- 2.9.3.2 Use of MOUs or MOAs may or may not be warranted based on how state officials respond during an outbreak.
- 2.9.3.3 A governor's emergency declaration for response in an animal disease outbreak could supersede existing Interjurisdictional agreements or MOUs.
- 2.9.3.4 States may not honor or recognize MOUs once an outbreak occurs due to political pressure or public perception.

2.9.4 Recommendations

- 2.9.4.1 Project performers recommend that individual states and territories decide how and when they enter into interjurisdictional agreements or MOUs, and that they are not developed as part of this project.
- 2.9.4.2 Project performers recommend that states develop incident-specific interjurisdictional agreements or MOUs at the time of the incident rather than as part of this project.

3.0 BULK TRANSPORT REGULATIONS

3.1 Requirements

This task involved working with the USDOT to modify existing infectious material regulations to include bulk transport of infectious material in quantities greater than 175 pounds. Activities were to include reviewing existing applicable regulations, identifying gaps, and negotiating with USDOT to resolve the limitations.

3.2 Activities Performed

The project team reviewed USDOT and USDA APHIS regulations related to bulk infected carcass movement protocols, identified gaps related to bulk transport of infected carcasses and contacted USDOT about options for addressing the gaps.

3.3 Findings

- 3.3.1 The US Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) does not address bulk shipment of infected animal carcasses in excess of 175 pounds per container. Therefore, anything more than 175 pounds is not addressed in the Code of Federal Regulations Part 49 pertaining to hazardous shipments.
- 3.3.2 Officials of the USDOT informed the project team that a special classification could be obtained for shipments of infected carcasses in excess of 175 pounds, but USDA would have to apply for the classification through USDOT's online system.
- 3.3.3 The USDOT regulations require hazardous materials manifests, classification and placarding.
- 3.3.4 Current USDA APHIS regulations only address live animal movement and not bulk carcass transport.

3.4 Recommendations

- 3.4.1 The project team recommends that USDA work with USDOT to establish the requirements related to a special classification that will address placarding, manifesting and classification for infected carcasses.
- 3.4.2 The performers recommend utilizing bulk transport in the event of an outbreak if transport protocols are met and risks mitigated.
- 3.4.3 The performers recommend that USDA consider testing the use of both USDOT and VS 127 protocols in a Full-Scale Exercise(FSE), identify gaps for either/or both of the options and report the recommendations after conducting the FSE.

4.0 ADVANCE GENERAL PERMITS

4.1 Requirements

This task required the performers to identify and contact the appropriate regulatory agencies (federal, state, and/or local) in the region to determine if permits are required or would be advantageous for movement of infectious materials during an outbreak. Performers developed draft general permit language for bulk transport and obtained stakeholder input through workshops.

4.2 Activities Performed

The performers discussed permitting requirements at the Canyon, TX, Des Moines, IA and Kansas City, MO workshops. Performers obtained stakeholder input for permitting language, and developed a modified VS form 1-27 permit for use in the bulk transport of infected carcasses, see Appendix D: Carcass Movement Permit.

4.3 Findings

- 4.3.1 The USDA Veterinary Services (VS) Permit for Movement of Restricted Animals (form 1-27), the current permit utilized for the movement of infected or potentially infected animals is not designed for livestock carcasses because it does not have an option to indicate that the animals have been euthanized nor how they were euthanized.
- 4.3.2 During workshop discussions, performers determined that a permit for the movement of bulk livestock carcasses would be advantageous during an animal disease outbreak.
- 4.3.3 Permitting transport of infected livestock carcasses will enable all movements of carcasses to be tracked, and would help mitigate disease spread by verifying all decontamination activities are conducted.
- 4.3.4 There are jurisdictional challenges of tracking movement between zones.
- 4.3.5 Development and implementation of a new national permit for livestock carcass transport to utilize during an outbreak would entail a large undertaking for development, training, implementation.

4.4 Recommendations

- 4.4.1 Performers recommend that the VS Form 1-27 should be modified to include the shipment of bulk infected carcasses until a new permit can be developed and implemented in a nation-wide system or process.
- 4.4.2 Performers recommend that the VS form 1-27 be tracked in EMRS-II.
- 4.4.3 Performers recommend that the new permit for transporting livestock carcasses should allow for accountability and control without adding undue burden during an animal disease outbreak.

5.0 RISK ASSESSMENT

The goal of the Risk Assessment was to evaluate the magnitude of risk of infecting susceptible livestock species by transporting infected cattle and swine carcasses from FMD infected premises within a control zone to an off-site carcass management facility outside the control zone. The results of the Risk Assessment are intended to provide a baseline for which decisions on mitigations of risk could be made.

5.1 Scope

The Risk Assessment evaluated the likelihood that: swine and cattle carcasses from a FMD-infected premises will contain an infective FMDv dose after completion of euthanasia; that FMDv could be released into the environment from the carcasses through post-mortem leakage of infected body fluids and/or aerosolization of infectious particles from the body fluids; and that susceptible livestock will be infected by FMDv during the transportation of carcasses from the infected premises to a carcass management site.

5.2 Activities Performed

The Risk Assessment authors used the APHIS FAD PReP documents, USDOT regulations and APHIS carcass transportation regulations as a basis for the assumptions used in the assessment and they used the World Organization for Animal Health (OIE) Guidelines for Developing a Quantitative Risk Assessment Model to guide their analysis process. They evaluated technical publications and applicable regulations for risk assessment parameters, and solicited opinions from experts when data was not available. The risk assessment parameters included: FMDv concentration in swine and cattle carcass tissues, FMD virus characteristics, environmental persistence, and transmission mechanisms. They also referred to information on bioaerosol science, FMDv aerosolization, and they consulted with bioaerosol experts.

The risk assessment authors used a stochastic disease spread model to estimate the time for FMD detection. They then assessed scenarios, pathways and depopulation practices based on the current practices and regulations applicable during an animal disease outbreak in the U.S. They considered expert opinions and made site visits to verify the characteristics, types of conveyance methods, and equipment used to transport the infected carcasses.

5.3 Findings

- 5.3.1 The FMD virus could be released into the environment from livestock carcasses through post-mortem leakage of infected body fluids and/or aerosolization of infectious particles from the body fluids.
- 5.3.2 Mitigation measures such as sealed tailgate, tarp cover and the use of Bio-Zip™ or similar bags will minimize the likelihood of leakage and spillage of carcass fluids from the carcass management truck, see Figure 5.3-1.
- 5.3.3 Mitigation measures such as sealed tailgate, tarp cover and the use of Bio-Zip or similar bags will minimize the likelihood of bioaerosols emanating from a trailer and spreading infectious virus through carcass transportation activities.
- 5.3.4 Based on the proposed mitigations in the assessment and the apparent effectiveness on the likelihood of virus to be released by the movement of carcasses, the authors concluded that the likelihood of exposure to FMDv by susceptible populations during the movement of infected carcasses will be negligible.
- 5.3.5 Due to the framework, toolset and scientific data required, completing an animal health risk assessment in a timely manner during an outbreak is impractical.
- 5.3.6 Code of Federal Regulations 49 CFR Part 175 does not address the movement of intact infected carcasses.
- 5.3.7 There are no studies on carcass bioaerosols production in literature and aerosol behavior cannot be modeled mathematically because there is not sufficient information on concentration, distribution, composition and environmental and atmospheric conditions.

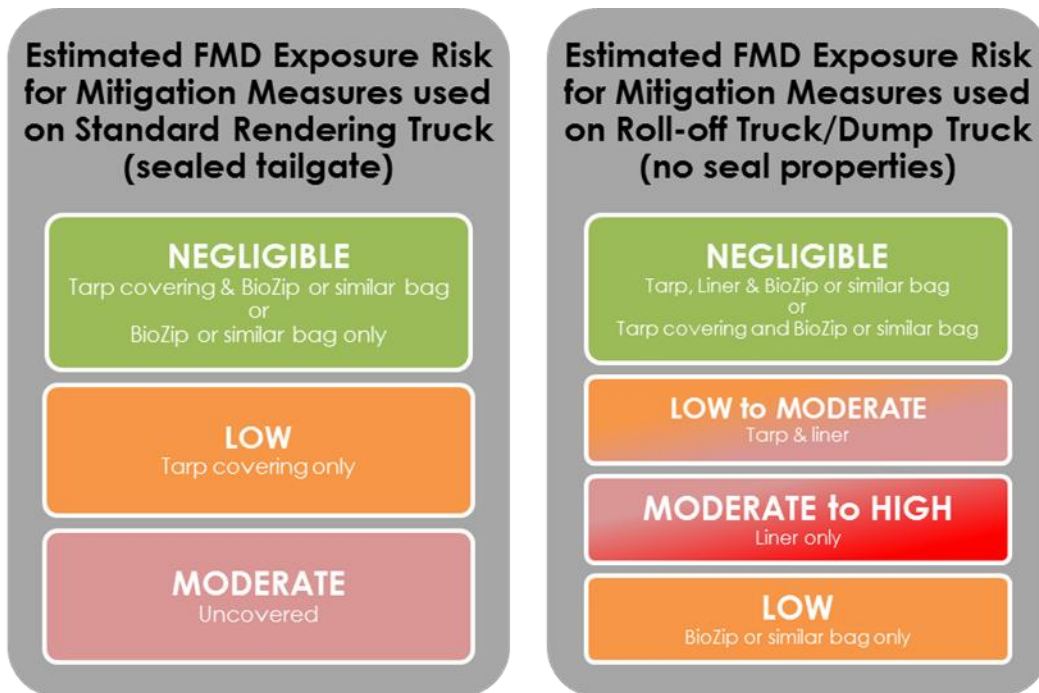


Figure 5.3-1 - Estimated FMD Exposure Risk for Mitigation Measures and Conveyance Types

5.4 Recommendations

- 5.4.1 Authors recommend producers evaluate site-specific risk prior to an outbreak in order to assess the effectiveness of current practices, and preventative measures.
- 5.4.2 Recommend transporting carcasses using Bio-Zip or other similar bag to reduce the risk of leakage and aerosolization in standard rendering trucks and other conveyance types.
- 5.4.3 Risk Assessment authors recommend that Federal Regulations identify how large quantities of infected carcasses will be classified for transport.
- 5.4.4 Risk Assessment authors recommend conducting additional research and targeted experimentation on the aerosolization of FMD virus, such as:
 - 5.4.4.1 Exploring new modeling approaches for identifying the aerosol route of infection or cross contamination between personnel and equipment.
 - 5.4.4.2 Conducting additional research to identify the amount of virus present in naturally infected animals and their tissues.
 - 5.4.4.3 Conducting research to gather data on the infectivity of waste materials (i.e. aerosols, liquids, and solids) generated during depopulation, carcass management, and decontamination operations.

6.0 OPTIMAL CARCASS MANAGEMENT CAPACITY IN STUDY REGIONS

This task involved determining the optimal rendering and landfill capacity to serve routine needs as well as outbreak surge capacity in the target regions, and comparing the optimal capacity with the existing capacity to evaluate the need for additional carcass management options in the region. This task consisted of the following subtasks; estimating current carcass management capacity, estimating current storage capacity, estimating needed capacity based on number of FMD-susceptible animals in the study regions, identifying practical parameters for carcass management and storage, and developing a strategy to achieve needed capacity.

6.1 Current Carcass Management Capacity

6.1.1 Requirements

This subtask required performers to obtain the current maximum rendering and landfill capacity (including operating facilities, closed facilities, and new facilities coming on line) in the study regions. Performers were required to evaluate the distribution of facilities and note if all areas have ready access to carcass management options.

6.1.2 Activities Performed

Performers consulted existing databases to identify carcass management facilities and conducted telephone interviews with rendering and landfill operators to obtain current maximum rendering and landfill capacities in the study areas. Online surveys using Survey Monkey, paper-based personal interviews, and contact with some state regulatory agencies were also used in the beef cattle region.

In the five-state beef cattle area, landfill and rendering capacity and locations were mapped using *Street Atlas USA 2014 Plus*®, while another program was used by the North Carolina performers to map validated landfill and rendering locations and capacities nationally. A Microsoft Access® database was also created for the information related to the five-state beef cattle production area.

6.1.3 Findings

- 6.1.3.1 The number of animals that can be disposed of in a landfill or rendering facility in a short period is limited by operational constraints, such as amount of labor, space, and equipment available to collect, load, transport and unload the material.
- 6.1.3.2 It is unlikely that landfills and renderers would be willing to commit total capacity to carcass management because of routine contracts, so even the

- reported capacity may not be available for emergency response to a livestock incident.
- 6.1.3.3 Some landfill and rendering facility operators contacted expressed reluctance to accept FMDv infected carcasses due to public perception and business continuity concerns.
 - 6.1.3.4 The beef cattle region reported 190 landfills that stated an ability to accept carcasses with a total unconfirmed capacity of 161,000 tons per week.
 - 6.1.3.5 The North Carolina swine production area reported 40 landfills with a total unconfirmed capacity of 144,000 tons per week.
 - 6.1.3.6 The beef cattle region reported 3 rendering plants and 1 processor that stated the ability to accept carcasses for a total confirmed capacity of 3,080 tons per week. Other rendering capacity exists but the companies were unwilling to include their capacities in the published results.
 - 6.1.3.7 The North Carolina swine production area reported 6 rendering plants with a total unconfirmed capacity of 31,500 tons per week.

6.1.4 Recommendations

- 6.1.4.1 States should annually request landfill and rendering capacity data from their Department of Homeland Security (DHS) Protected Critical Infrastructure Program (PCIP) or similar.
- 6.1.4.2 State and industry planners should consult rendering facilities and landfills within their region pre-outbreak to determine if the facilities will accept infected carcasses during an emergency. If so, those facilities can be included in state or local carcass management plans.
- 6.1.4.3 The potential quantity and source of indemnity funds or insurance coverage for producers, if any, should be identified prior to an outbreak.
- 6.1.4.4 States may want to investigate government or independently owned landfills before corporate landfills who may be concerned about brand image.
- 6.1.4.5 States should consider developing livestock carcass management Standard Operating Procedures and MOUs for use with rendering and landfill facility operators.
- 6.1.4.6 Federal and state officials should develop cleaning and disinfection protocols for rendering facilities as well as biosecurity protocols for rendering and landfill operations.
- 6.1.4.7 States should work with landfill and rendering facilities to develop business continuity plans for animal health emergencies.

- 6.1.4.8 Federal and state officials should investigate pre-treatment methods to reduce or eliminate virus prior to transport to off-site carcass management.
- 6.1.4.9 Planners should conduct systems analysis to develop business continuity plans for as many industry sectors as possible.

6.2 Current Storage Capacity

6.2.1 Requirements

This subtask required performers to identify existing refrigerated and other short/medium-term storage capacity for carcasses awaiting management.

6.2.2 Activities Performed

Storage solutions for livestock carcasses were discussed during workshops in Durham, NC and Canyon, TX. The five-state cattle production region cold storage capacity data was obtained by contacting operators and warehouses in that area.

6.2.3 Findings

- 6.2.3.1 North Carolina reported there are not enough storage containers in their study area to store the amount of swine carcasses likely to be generated during a widespread animal disease outbreak.
- 6.2.3.2 Although cold storage of livestock carcasses might be helpful when managing large numbers of carcasses, cold storage warehouses are scarce and they might be difficult to clean and disinfect for returning to normal operations so owners may be reluctant to accept infected carcasses.
- 6.2.3.3 Should an outbreak occur during winter or in colder regions where temperatures are below freezing, carcasses could be stored on-site outdoors while waiting for off-site management.
- 6.2.3.4 In addition to fixed cold storage warehouses, there are also a limited number of mobile refrigeration units available which are used to move edible products for human consumption; however, they would need to be cleaned and disinfected, which may prove logistically challenging.
- 6.2.3.5 Whole livestock carcasses are not easily stacked and the entire capacity of the cold storage container will not be used due to the size and shape of the carcasses.
- 6.2.3.6 Large carcasses are difficult to handle and moving them in and out of a portable or mobile storage unit would be difficult and specialized loading equipment would be necessary.
- 6.2.3.7 The availability of refrigerated trailers and containers a company can lease at one time within 36 hours of notification also varies by company, trailer or container size, and time of year, with more containers available during seasons of low shipping traffic.
- 6.2.3.8 There are 80 Cold Storage Warehouses in the five-state beef production region with a combined total capacity of 220 million cubic feet.

6.2.4 Recommendations

- 6.2.4.1 Calculating volume per head instead of total weight when determining cold storage capacity needed for livestock carcasses, recommend reducing the total number by 15percent for allowance of whole carcasses.
- 6.2.4.2 States and producers should include cold storage operators in catastrophic carcass management plan discussions to identify capacity, if carcasses will be accepted, and the type of storage that will be made available.
- 6.2.4.3 States and producers should establish MOUs with cold storage facilities and operators to developing contingency plans for carcasses awaiting management.
- 6.2.4.4 Additional research is needed to develop cleaning and disinfection protocols for cold storage containers and warehouses.
- 6.2.4.5 States and producers should include specialized equipment for loading/unloading of carcasses in plans that involve cold storage for livestock carcasses.
- 6.2.4.6 State and producer carcass management plans should consider storing carcasses on-site if an animal health emergency occurs when temperatures are below freezing.

6.3 Needed Capacity

6.3.1 Requirements

This subtask required performers to calculate the number and size of livestock likely to require management in their areas during an outbreak.

6.3.2 Activities Performed

USDA livestock census data was used to determine the number and locations of livestock. The five-state beef production area data was loaded into a database and mapped for ease of analysis.

6.3.3 Findings

- 6.3.3.1 Not all states require producers to report capacities, so the exact number of livestock in the five-state cattle producing region is not known.
- 6.3.3.2 The five-state cattle producing area reported 611 beef concentrated animal feeding operation (CAFO)s with a combined capacity of 10.3 million animals, 214 dairy operations with a combined capacity of 1.48 million animals, and 3 other/mixed livestock CAFOs with a combined capacity of 12,200 animals.
- 6.3.3.3 The North Carolina swine producing region reported 8,700,000 head of swine on an unreported number of farms.
- 6.3.3.4 The exact number of carcasses can vary greatly depending on what strategy is used during the outbreak.
- 6.3.3.5 If strategies such as vaccination are used, the numbers of carcasses may be reduced.
- 6.3.3.6 There could be additional carcasses that would result from slaughter due to animal welfare considerations, which is difficult to estimate.

6.3.4 Recommendations

- 6.3.4.1 States should obtain annually updated data from their appropriate state or federal agencies because the livestock census is only performed every 5 years.
- 6.3.4.2 Governments and industry should continue to develop business continuity plans for livestock producers.
- 6.3.4.3 Neighboring states should collaborate to develop a regional carcass management plan to identify solutions for gaining additional carcass management capacity.

6.4 Practical Parameters for Carcass Management, Storage

6.4.1 Requirements

This subtask required the performers to identify practical parameters for carcass management including decayed versus refrigerated carcasses and determine if there are any parameters under which rendering or landfiling cannot occur, increasing need for storage capacity.

6.4.2 Activities Performed

Performers collected data by reviewing state carcass management regulations, and discussing parameters for carcass management and storage at the Durham, NC and Canyon, TX workshops.

6.4.3 Findings

- 6.4.3.1 Landfills that will accept infected livestock carcasses may have restrictions on the volume and type of livestock mortalities accepted; require special carcass preparation, handling and shipping procedures; and require additional fees.
- 6.4.3.2 Stop-movement orders would have to be modified to allow transport of livestock carcasses to offsite rendering and landfiling facilities.
- 6.4.3.3 Rendering and landfiling cannot occur if a state's regulations expressly prohibit landfiling or rendering of livestock carcasses, or require infected carcasses to be disposed of in a specific manner.

6.4.4 Recommendations

- 6.4.4.1 State carcass management plans should identify any specific resources that may be required for storage and carcass management (such as refrigerated storage units, ramps, loading docks, pallets, fork-lifts, grinders, Bio-Zip or similar bags, etc.)
- 6.4.4.2 States should update carcass management plans and remove restrictions upon landfill and rendering disposal.
- 6.4.4.3 States should evaluate available storage solutions in the event livestock carcasses cannot be disposed of in a timely manner.
- 6.4.4.4 Response teams should transport livestock carcasses with leak-resistant and/or lined conveyances to minimize leakage during transport.

6.5 Strategy to Achieve Needed Capacity

6.5.1 Requirements

For this subtask, the performers were required to compare the available carcass management capacity and compare it with the needed capacity in the event of an outbreak. If the available capacity was inadequate, the performers were to develop a recommended strategy for achieving the needed capacity.

6.5.2 Activities Performed

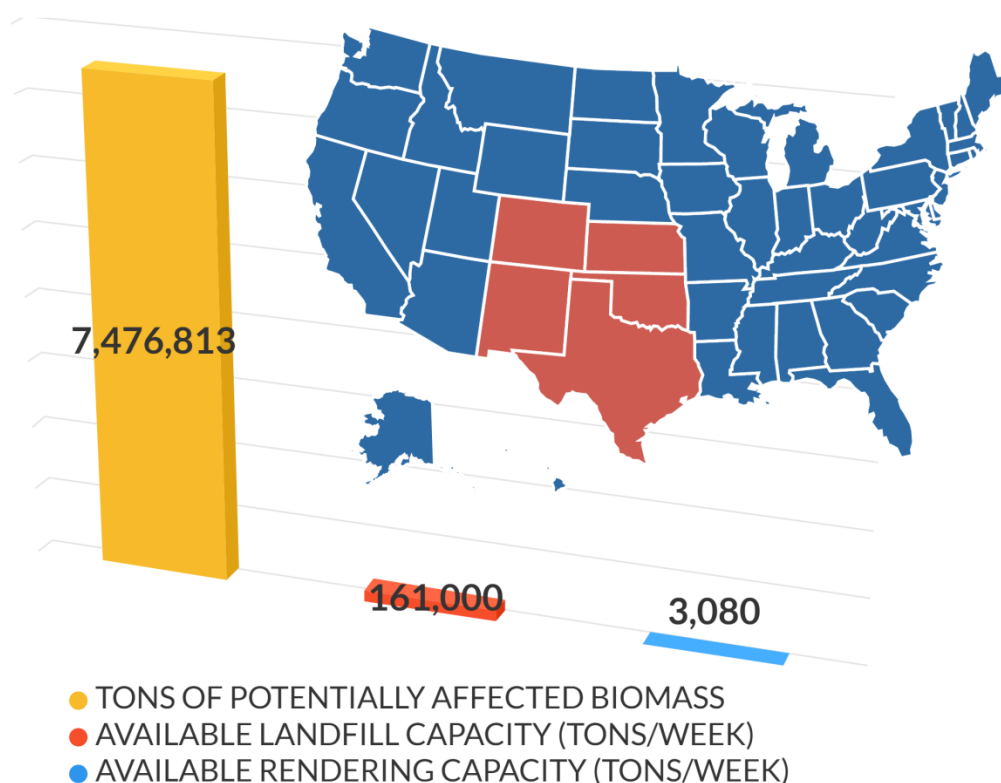
The performers collected the data and used various mapping, database, and calculation programs to help analyze it. In the beef cattle region, landfills and rendering facilities were contacted to determine if they were able to expand their capacities.

6.5.3 Findings

- 6.5.3.1 It would take 46 weeks to manage all FMD susceptible animal carcasses in five-state beef cattle producing region if all reported landfill and rendering capacity is available; most likely only a fraction of that would be available, see Figure 6.5-1.
- 6.5.3.2 It would take seven weeks to manage all FMD susceptible swine carcasses in the North Carolina swine producing area if all reported landfill and rendering capacity is available; most likely only a fraction of that would be available, see Figure 6.5-2.
- 6.5.3.3 Several landfills and rendering facilities did not respond to the project survey, therefore exact capacities are not known.
- 6.5.3.4 In the five-state beef cattle region, 96 municipal solid waste (MSW) landfills and 20 small arid exempt (SAE) landfills that accept livestock carcasses have the ability to expand their operation.
- 6.5.3.5 Permitting can be a barrier to expanding MSW and SAE landfills.

HOW MANY WEEKS NEEDED TO MANAGE CARCASSES ?

IN THE FIVE-STATE CATTLE PRODUCING REGION

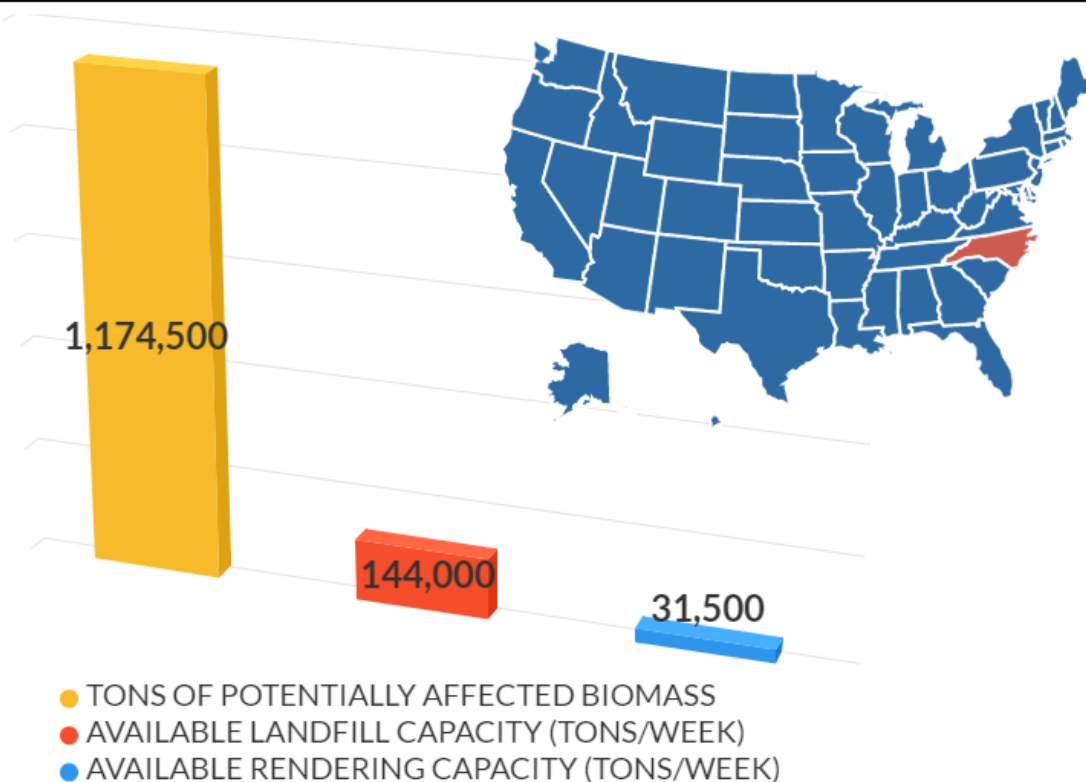


46 WEEKS TO MANAGE
CARCASSES
*In the five-state cattle producing
region*

Figure 6.5 -1 - Five-State Cattle Producing Region Carcass Management Capacity

HOW MANY WEEKS NEEDED TO MANAGE CARCASSES ?

IN THE NORTH CAROLINA SWINE PRODUCING REGION



07 WEEKS TO MANAGE
CARCASSES
*In the North Carolina swine
producing region*

Figure 6.5-2 - North Carolina Swine Producing Region Carcass Management Capacity

6.5.4 Recommendations

- 6.5.4.1 States should verify landfill and rendering capacities periodically in order to get a more accurate idea of carcass management capacities in their state and region.
- 6.5.4.2 States should develop a regional carcass management plan to address a multi-state outbreak or natural disaster requiring mass carcass management.
- 6.5.4.3 State and Federal responders should utilize existing tools (Matrix, Decision Loop, Checklist, WebSoil Survey, and Disposal Calculator) to identify carcass management options in the event of a mass livestock emergency.
- 6.5.4.4 Stakeholders should establish one or more working groups to further study strategies to achieve needed surge capacity.
- 6.5.4.5 States should analyze the possibility of designing, permitting, and/or building landfills exclusively for livestock that would remain dormant until needed.
- 6.5.4.6 Decision makers should explore alternatives to depopulation and carcass management, including; vaccination, segmented harvest in which non-infected animals from an infected premise are taken to harvest possibly prior to reaching full harvest weight. Lighter weight animals may be vaccinated with intent to harvest at maturity. Further risk analysis for all these alternatives should be pursued.

7.0 WORKSHOPS

This task required performers to hold one or more workshops with stakeholders to discuss proposed strategies, and to hold periodic conference calls among team members. Workshop topics, discussion, and outcomes were documented in reports electronically distributed to all participants. A total of five workshops were conducted throughout the duration of the five year Logistical Infrastructure project, including a national-level workshop to that was held in Kansas City, MO on March 18-19, 2015.

7.1 Logistical Considerations for Livestock Carcass Disposal Workshop

7.1.1 Activities Performed

The Logistical Considerations for Livestock Carcass Disposal Workshop was held in Canyon, TX on November 15, 2012. The purpose of the Workshop was to bring together Agricultural Waste Disposal Subject Matter Experts (SMEs) from Texas, Colorado, Oklahoma, Kansas and New Mexico to review the gaps and the latest best practices associated with the movement of Foot and Mouth Disease (FMD) infected carcasses. There were over sixty people in attendance representing state, local, regional and federal, agricultural and emergency management officials, the cattle and dairy industries, and the private sector.

The Logistical Considerations for Livestock Carcass Disposal Workshop participants discussed the biosecurity risks of transportation associated with the transport of FMD carcasses, and the permitting process (including any issues) needed to facilitate movement. Discussion also involved the options for carcass management; current capacity of renderers and landfills, identified ways to increase capacity, and develop possible incentives for these industries to accept FMD carcasses.

7.1.2 Findings

- 7.1.2.1 The majority of participants reported being unprepared for an FMD outbreak.
 - 7.1.2.1.1 69 percent of participant's agencies or organizations have not met with landfill or waste management facilities in order to prepare them for an outbreak.
 - 7.1.2.1.2 73 percent of participants did not know the landfill capacity for carcass management within 150 miles of dairies or feedyards.
- 7.1.2.2 During the California Exotic Newcastle outbreak, permits for transport were waived under the governor's declaration.
 - 7.1.2.2.1 Because permits were waived, people overloaded the weight limits on trailers, causing them to break down in transit.

- 7.1.2.2.2 Response efforts were slowed because law enforcement had to conduct weight checks on trucks en route to carcass management sites to ensure public safety.
- 7.1.2.3 Participants agreed that landfill was the best off-site carcass management option due to capacity and willingness to accept FMD infected carcasses.
 - 7.1.2.3.1 Landfill use for mass carcass management could result in an unprecedented amount of leachate.
 - 7.1.2.3.2 Stamping out could outpace landfill capacity.
- 7.1.2.4 Rendering facilities expressed reluctance to accept FMD infected carcasses due to business continuity, air quality standards, disinfection, and public perception concerns.
- 7.1.2.5 Participants thought enormous resources would be required for transporting off-site, including labor hours.

7.1.3 Recommendations

- 7.1.3.1 States and industry should coordinate on developing plans ahead of an outbreak.
- 7.1.3.2 Vaccination should be explored as a primary option to mitigate depopulation, transport and carcass management issues during an outbreak.
- 7.1.3.3 A dialogue needs to be started with renderers, landfill facilities and National Guard in order to identify and address capability gaps.
- 7.1.3.4 Need to determine and establish adequate decontamination process for cleaning rendering facilities and equipment used during an outbreak before it occurs.
- 7.1.3.5 Feedyards should investigate regulatory pre-approval for on-site carcass management areas.
- 7.1.3.6 USDA should evaluate indemnification, compensation, and condemnation guidelines to ensure they are as fair and equitable as possible.

7.2 Rendering and Landfill Capacity Workshop

7.2.1 Activities Performed

A Rendering and Landfill Capacity Workshop was held in Durham, NC on December 4, 2012. The workshop included representatives from twelve states and included veterinarians, environmental professionals, state regulatory officials, engineers and experts from the rendering and landfill industries. States represented included Tennessee, Florida, Virginia, West Virginia, South Carolina, Alabama, Kentucky, Georgia, Louisiana, and Mississippi. The workshop included a discussion of carcass management options, capacity planning sessions, and presentations by representatives from the solid waste disposal and rendering industries. The capacity planning sessions showcased developmental tools that could potentially be used in pre-event planning as well as during an actual event.

7.2.2 Findings

- 7.2.2.1 There is no guarantee that rendering plant owners or operators will accept infected livestock carcasses.
- 7.2.2.2 Most rendering facilities operate five or six days a week and many facilities are able to increase their overall capacity up to a certain percentage.
- 7.2.2.3 Disposing of disease-free livestock carcasses resulting from a mass-mortality natural disaster presents fewer obstacles than disposing of infected carcasses after a FMD outbreak.
- 7.2.2.4 Infected carcasses could potentially be rendered prior to delivery at a landfill to decrease the overall biomass and inactivate the FMD virus.
- 7.2.2.5 Livestock carcasses could potentially be pretreated with a virucidal agent prior to disposal at a landfill.
- 7.2.2.6 Decomposed livestock carcasses may require processing with absorbent material prior to landfill disposal, resulting in additional cost.

7.2.3 Recommendations

- 7.2.3.1 States need to develop Standard Operating Procedures for rendering and landfill carcass management.
- 7.2.3.2 States need to cooperatively develop Memorandums of Understanding with landfill and rendering operators for the use of their facilities for livestock carcass management in FMD outbreaks and natural disasters.
- 7.2.3.3 Rendering facility and landfill locations and capacities should be incorporated into state plans and updated periodically.

- 7.2.3.4 Cleaning and disinfection protocols for rendering facilities and landfills are needed.
- 7.2.3.5 Landfill and rendering facility business continuity plans need to be developed for animal health emergencies.
- 7.2.3.6 Carcass pre-treatment methods to reduce or eliminate virus prior to transport should be investigated.

7.3 Transporting Infected Carcasses Workshop

7.3.1 Activities Performed

The Transporting Infected Carcasses Workshop was held in Des Moines, IA on April 9-10, 2013. Attendees represented states that are robust in the swine and dairy industries; Iowa, Wisconsin, Minnesota, California, and North Carolina. A primary objective for the workshop was to develop a forum to discuss 'national best practices' for transporting FMD infected carcasses to allow greater use of off-site options such as rendering and landfill facilities, while understanding that there are livestock production areas where on-site burial may not be an option.

The workshop specifically focused on developing transportation protocols for infected carcasses, should a Foot-and-Mouth Disease (FMD) outbreak occur.

7.3.2 Findings

- 7.3.2.1 Current USDOT regulations do not adequately address bulk transport of infected carcasses.
- 7.3.2.2 Transporting infected livestock carcasses from affected areas to areas outside of the outbreak could cause jurisdictional challenges.
- 7.3.2.3 There is no guidance regarding the material classification of bulk infected livestock carcasses.
- 7.3.2.4 If infected livestock carcasses are classified as hazardous material, none of the carcass haulers would have the necessary credentials to transport material classified as infectious.
- 7.3.2.5 Permitting could be used to establish and maintain accountability during transport.

7.3.3 Recommendations

- 7.3.3.1 Implement biosecurity and safety protocols at points of origin, destination, and all points in between for movement of infected livestock carcasses during an animal disease outbreak.
- 7.3.3.2 Evaluate pre-treatment of carcasses with a disinfectant prior to shipment, such as a liquid spray or foam providing an additional layer of protection.
- 7.3.3.3 Consider avoiding vehicle convoys during movement of infected livestock carcasses, as this could delay movement at the origination as well as at the destination.
- 7.3.3.4 Utilize a tracking device on each vehicle (such as a GPS) transporting infected livestock carcasses to help monitor and maintain control of all movements.

- 7.3.3.5 Conveyances transporting infected livestock carcasses must be leak-resistant to prevent liquids from leaking out of the conveyance during transport.
- 7.3.3.6 Conveyances transporting infected livestock carcasses must be covered to prevent air from flowing over the top of the carcasses; the cover must be drawn tight and fastened securely to avoid shifting during transport.
- 7.3.3.7 Openings on conveyances transporting infected livestock carcasses should be secured with a primary closure and a secondary mechanism for additional security.
- 7.3.3.8 Conveyances transporting infected livestock carcasses should use liners as an additional precaution.
- 7.3.3.9 Both USDOT and USDA should collaborate to clarify material classification and permitting for bulk transport of livestock carcasses.
- 7.3.3.10 Permitting should be used to facilitate transport of carcasses inside an infected area through a non-infected area or to a disposal facility outside of an infected area.
- 7.3.3.11 Any new permitting system implemented for infected livestock carcass transport should add minimal burden.
- 7.3.3.12 Any new permitting system or classification for bulk transport of livestock carcasses should be done in advance of an animal health emergency.

7.4 North Carolina Carcass Management & Disposal Workshop

7.4.1 Activities Performed

The North Carolina Carcass Management and Disposal Workshop was held in Durham, NC on May 20, 2014. The purpose of the workshop was to bring together Agricultural and Waste Disposal Subject Matter Experts from North Carolina to consider the various carcass management and disposal tools available during a catastrophic event, such as FMD. Those in attendance were federal, state, regional, and local, agricultural and emergency management officials, as well as members of the swine industry.

The Durham workshop intended to discuss and test new carcass management tools and increase awareness of carcass management options.

7.4.2 Findings

- 7.4.2.1 The USDA WebSoil Survey Online Tool produces a suitability map for catastrophic livestock burial.
- 7.4.2.2 The USDA-APHIS Carcass Management Matrix illustrates the most favorable to least favorable carcass management choices for large animals, based on 15 criteria.
- 7.4.2.3 The USDA-APHIS Decision Loop provides a tool for rapid decision making starting with the most favorable to least favorable option based on the matrix.
- 7.4.2.4 The USDA-APHIS Carcass Management Checklist includes criteria to consider when making the decision for each carcass management option.
- 7.4.2.5 The NCDA&CS Disposal Calculator features a national database of landfills, and renderers, it includes conveyances and calculates capacity needed to transport and dispose of different animal types.
- 7.4.2.6 The transportable gasifier has low air emissions and is energy efficient, but it is difficult to transport and has limited throughput and capacity.
- 7.4.2.7 The automated non-freezing portable vehicle wash tunnel can decontaminate a vehicle in minutes at a cost of \$150,000 per unit.
- 7.4.2.8 Most NC soils may not be suitable for burial but the option requires further soil and hydrology studies.
- 7.4.2.9 On-site burial requires the property owner to disclose burial and could have a long-term cleanup liability.
- 7.4.2.10 Stop movement order prevents farms from obtaining feed and marketing livestock, resulting in overcrowding and starvation.

7.4.3 Recommendations

- 7.4.3.1 Further soil and hydrology studies are needed to determine on-site burial suitability in North Carolina.
- 7.4.3.2 Need to address biosecurity issues associated with landfill disposal.
- 7.4.3.3 Need to develop on-site burial protocols.
- 7.4.3.4 Need to perform additional research on unlined burial and leachate management.
- 7.4.3.5 Consider a managed movement program in lieu of stop movement to minimize welfare slaughter activity.
- 7.4.3.6 Recommend building map overlays for each state displaying farms and adjacent landfills, rendering plants and burial options.

7.5 National Workshop on Carcass Management Logistics

7.5.1 Activities Performed

The National Workshop on Carcass Management Logistics was held in Kansas City, MO on March 18-19, 2015. The workshop was attended by over 70 professionals representing federal, state, tribal, and local agencies, academia, and industry to discuss the logistical challenges associated with animal carcass management. Representatives from West Texas A&M University, NCDA&CS, and the University of Minnesota presented their research findings on this subject.

7.5.2 Findings

- 7.5.2.1 The current number of swine in Wisconsin, Iowa, California, Minnesota and North Carolina exceeds carcass management capacities.
- 7.5.2.2 The DOT regulations for infectious materials do not address the bulk transport of potentially infected carcasses.
- 7.5.2.3 Current regulations (USDOT and EPA) require the use of a Uniform Hazardous Waste Manifest, a paper document that is unfamiliar to animal health responders.
- 7.5.2.4 EMRS-II, a web-based emergency management tool developed by the USDA could be used to track resources and personnel, generate the 1-27 Form, and automatically link to destination point of contact for interstate movement.
- 7.5.2.5 The VS Form 1-27 could be used as an alternative to a USDOT Uniform Hazardous Waste Manifest to manage the transport of carcasses.
- 7.5.2.6 Cattle haulers do not regularly deal with animals or carcasses that have been infected with Foreign Animal Disease (FAD).
- 7.5.2.7 Many states have outdated regulations or plans.
- 7.5.2.8 Due to the large numbers of livestock on feedyards, stamping out is likely not possible.
- 7.5.2.9 Feral swine populations present biosecurity issues during an FMD outbreak.

7.5.3 Recommendations

- 7.5.3.1 Need clear guidance from USDOT regarding the bulk transport of infected carcasses; do not recommend classifying carcasses as hazardous waste.
- 7.5.3.2 Recommend finding an alternative to the Uniform Hazardous Waste Manifest, such as modifying the VS-127 for bulk carcass transport, or developing a new permit for national use.

- 7.5.3.3 Update USDA indemnification guidance for depopulation required during an FMD or other animal disease outbreak.
- 7.5.3.4 Recommend states develop MOU's to facilitate depopulation and carcass management.
- 7.5.3.5 States need to update their response plans and regulations for FMD outbreak.
- 7.5.3.6 Recommend working with manufacturers to procure Bio-Zip or other similar bag so they are available for use in an animal health emergency.

8.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

Transport Parameters – Regulations

FINDINGS

- ◆ There is no federal regulation which specifically addresses the movement of mass numbers of infected carcasses in the event of an FMD outbreak.
- ◆ No federal regulations provide specific guidelines for the bulk transport of diseased animal carcasses for disposal.

Transport Parameters – Regulations

RECOMMENDATIONS

- ◆ Plans should anticipate and identify a contingency plan for a ruling issued by the Secretary which may or may not allow for the transport of diseased carcasses.
- ◆ It is recommended that USDA coordinate with the USDOT to specifically identify requirements and methods for transporting bulk infected animal carcasses in the event of an animal disease outbreak. The performers recommend that the requirements follow USDA guidelines for transporting bulk infected carcasses, and at a minimum should include a sealed, leak-proof conveyance.
- ◆ States should develop a plan for transport of bulk infected carcasses for disposal. In addition to transport and disposal, plans should also address sale, stop-movement, quarantine, and the possibility of intrastate movement of infected carcasses from other states.
- ◆ The performers recommend that states develop interstate and regional agreements with landfills, renderers, and neighboring states as part of their emergency plans. These agreements, memorandums of understanding, and jurisdictional agreements should be established prior to a disease outbreak.

Transport Parameters – Types of Vehicles

FINDINGS

- ◆ The level of risk of FMD infection of susceptible livestock when transporting carcasses in a Rendering Truck (sealed tailgate) with a tarp cover and a Bio-Zip™ or similar bag is negligible.
- ◆ The level of risk of FMD infection of susceptible livestock when transporting carcasses in a Roll-Off Truck (not sealed or leak-resistant) with a liner, tarp covering and Bio-Zip™ or similar bag is negligible.
- ◆ Level of risk of FMD infection of susceptible livestock when transporting carcasses in a Dump Truck (not sealed or leak-proof) using a liner, tarp covering and Bio-Zip™ or similar bag is negligible.

Transport Parameters – Types of Vehicles

RECOMMENDATIONS

- ◆ The recommended type of vehicles to transport FMD-infected carcasses are a rendering truck with a sealed tailgate, roll off or dump truck with tarp cover and a Bio-Zip™ or similar bag to contain the carcasses.

Transport Parameters – Transport Methods

FINDINGS

- ◆ Highway transport would most likely be the preferred transport method in the event of a disease outbreak causing mass mortalities.
- ◆ Due to the limited number of rail loading facilities, carcasses must be transported by highway to the rail facility.
- ◆ Air transport is significantly more expensive than highway transport due to the resources and personnel required to maintain and operate the air craft.
- ◆ The regulatory guidance for ocean transport does not specifically authorize or address the transportation of large quantities of infected carcasses on ships.

Transport Parameters – Transport Methods

RECOMMENDATIONS

- ◆ Use highway transportation as the preferred method of transport because it is already regulated and commonly used for routine carcass management. In addition, transporting by a single method (highway) decreases handling and the risk of spreading pathogens through trans-loading onto a ship, aircraft or train.
- ◆ Performers do not recommend rail as a feasible transportation method due to the reluctance from the railroad industry, limited number of rail loading facilities, additional resources required for loading and unloading, and biosecurity concerns.
- ◆ Performers do not recommend air transport for infected carcasses due to cost, resources and biosecurity concerns.
- ◆ Performers do not recommend ship transport for carcasses because of the distance of feedlots from ports, increased decontamination requirements, time constraints and biosecurity concerns.

Transport Parameters – Decontamination Options

FINDINGS

- ◆ USDA FAD PReP guidelines and SOPs are already in use by the livestock industry, transport industry, and state and local animal health officials.
- ◆ The perception of the cleanliness of livestock and animal processing facilities will affect domestic and international markets.
- ◆ The use of decontamination procedures, proper PPE, trained personnel and the need for adequate space for loading and decontamination as described in APHIS and DHS manuals make transport of carcasses a complex, logistical task requiring significant resources and personnel.

Transport Parameters – Decontamination Options

RECOMMENDATIONS

- ◆ The performers recommend that cleaning and disinfection during an animal disease outbreak should follow USDA FAD PReP Guidelines and SOPs for disinfection of vehicles, equipment, and people.
- ◆ Carcasses should be placed in a conveyance suitable for transport over interstate highways. The conveyance should have a leak-resistant tailgate that will prevent liquids from escaping.
- ◆ The carcasses should be pretreated with a suitable disinfectant after placement in the conveyance.
- ◆ The entire conveyance (which includes trailer and primary mover, if applicable), with top cover in place, should then be moved to a disinfection point and the entire outside of the vehicle and conveyance should be disinfected.

Transport Parameters – Quality Assurance

FINDINGS

- ◆ None reported.

Transport Parameters – Quality Assurance

RECOMMENDATIONS

- ◆ Performers recommend signature verification of proper loading and securing of carcasses into an approved transport conveyance for all transport methods (truck, container, trailer, etc.)
- ◆ Performers recommend a qualified on-site representative verify (by signature) that all FAD PReP decontamination protocols were followed prior to receiving a transport permit.
- ◆ Performers recommend permitting to track all vehicle movements and as a secondary measure to ensure appropriate loading and decontamination procedures are followed.

Transport Parameters – Security

FINDINGS

- ◆ Physical security may be required at the loading and unloading facilities due to potential protests among residents or activists.
- ◆ Security for transport convoys could attract undesired attention from the public and media.
- ◆ Security at loading and unloading locations would likely be a decision of the Incident Management Team (IMT) on scene.

Transport Parameters – Security

RECOMMENDATIONS

- ◆ The performers recommend following Incident Commander's recommended security measures to mitigate risks to security of personnel at all locations; including loading and unloading locations as well as transporting in between those locations.

Transport Parameters – Manifesting

FINDINGS

- ◆ USDOT and EPA require the use of a Uniform Hazardous Waste Manifest when transporting hazardous materials.
- ◆ The current Manifest system is a paper document with multiple copies; it does not enable the systemic tracking of the movement of carcasses from the original premises to their final location.

Transport Parameters – Manifesting

RECOMMENDATIONS

- ◆ The Performers recommend amending the Veterinary Services (VS) form 1-27; to include the information collected on a manifest, to allow shipment of carcasses and to allow tracking conveyances moving from infected premises to off-site disposal facilities.
- ◆ Performers recommend using EMRS-II, a web-based emergency management tool developed by the USDA in partnership with state agencies to track the shipment of infected carcasses with the VS 1-27 form. This system will automatically link to destination point of contact for interstate movement.

Transport Parameters – Placarding

FINDINGS

- ◆ USDOT regulations do not address the bulk transportation of infected livestock carcasses, but do require placarding of vehicles transporting infected carcasses because FMD is hazardous to livestock.
- ◆ Placarding is utilized for everyday transportation efforts by first responders and transportation safety officials in identifying hazardous materials being shipped on roadways, airspace, and shipping lanes.
- ◆ Mandatory placarding of conveyances transporting bulk infected livestock carcasses could ultimately delay the disposal process.

Transport Parameters – Placarding

RECOMMENDATIONS

- ◆ The performers recommend that USDA work with USDOT to develop appropriate placarding requirements for bulk transport of carcasses of infected livestock, if any.
- ◆ The performers recommend that USDA request that USDOT waive placarding requirements in the event of an outbreak since all vehicles will be inspected, permitted, cleaned, disinfected, and tracked during transport, unless the placard provides another benefit beyond those covered by the permit.

Transport Parameters – Interjurisdictional Agreements

FINDINGS

- ◆ Colorado has MOUs with Nebraska and Kansas for intrastate livestock movement during a presumptive positive or confirmed positive foreign animal disease event.
- ◆ MOUs or MOAs may or may not be warranted based on how state officials respond during an outbreak.
- ◆ A governor's emergency declaration for response in an animal disease outbreak could supersede existing Interjurisdictional agreements or MOUs.
- ◆ States may not honor or recognize MOUs once an outbreak occurs due to political pressure or public perception.

Transport Parameters – Interjurisdictional Agreements

RECOMMENDATIONS

- ◆ Project performers recommend that individual states and territories decide how and when they enter into interjurisdictional agreements or MOUs, and that they not be developed as part of this project.
- ◆ Project performers recommend that states develop incident-specific interjurisdictional agreements or MOUs at the time of the incident rather than as part of this project.

Bulk Transport Regulations

FINDINGS

- ◆ The US Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) does not address bulk shipment of infected animal carcasses in excess of 175 pounds per container. Therefore, anything more than 175 pounds is not addressed in the Code of Federal Regulations Part 49 pertaining to hazardous shipments.
- ◆ USDOT informed the project team that a special classification could be obtained for shipments of infected carcasses in excess of 175 pounds, but USDA would have to apply for the classification through USDOT's online system.
- ◆ USDOT regulations require hazardous materials manifests, classification and placarding.
- ◆ USDA APHIS regulations only address live animal movement and not bulk carcass transport.

Bulk Transport Regulations

RECOMMENDATIONS

- ◆ The project team recommends that USDA work with USDOT to establish the requirements related to a special classification that will address placarding, manifesting and classification for infected carcasses.
- ◆ The performers recommend utilizing bulk transport in the event of an outbreak if transport protocols are met and risks mitigated.
- ◆ The performers recommend that USDA consider testing the use of both USDOT and VS 127 protocols in a Full-Scale Exercise(FSE), identify gaps for either/or both of the options and report the recommendations after conducting the FSE.

Advance General Permits

FINDINGS

- ◆ The USDA Veterinary Services (VS) Permit for Movement of Restricted Animals (form 1-27), the current permit utilized for the movement of infected or potentially infected animals is not designed for livestock carcasses because it does not have an option to indicate that the animals have been euthanized nor how they were euthanized.
- ◆ Permitting transport of infected livestock carcasses will enable all movements of carcasses to be tracked, and would help mitigate disease spread by verifying all decontamination activities are conducted.
- ◆ There are jurisdictional challenges of tracking movement between zones.
- ◆ Development and implementation of a new national permit for livestock carcass transport to utilize during an outbreak would entail a large undertaking for development, training, implementation.

Advance General Permits

RECOMMENDATIONS

- ◆ Performers recommend that the VS Form 1-27 should be modified to include the shipment of bulk infected carcasses until a new permit can be developed and implemented in a nation-wide system or process.
- ◆ Performers recommend that the VS form 1-27 be tracked in EMRS-II.
- ◆ Performers recommend that the new permit for transporting livestock carcasses should allow for accountability and control without adding undue burden during an animal disease outbreak.

Risk Assessment

FINDINGS

- ◆ Mitigation measures such as sealed tailgate, tarp cover and the use of Bio-Zip™ or similar bags will minimize the likelihood of leakage and spillage of carcass fluids from the carcass management truck.
- ◆ Mitigation measures such as sealed tailgate, tarp cover and the use of Bio-Zip or similar bags will minimize the likelihood of bioaerosols emanating from a trailer and spreading infectious virus through carcass transportation activities.
- ◆ Based on the proposed mitigations in the assessment and the apparent effectiveness on the likelihood of virus to be released by the movement of carcasses, the authors concluded that the likelihood of exposure to FMDv by susceptible populations during the movement of infected carcasses will be negligible.

Risk Assessment

RECOMMENDATIONS

- ◆ Recommend transporting carcasses using Bio-Zip or other similar bag to reduce the risk of leakage and aerosolization in standard rendering trucks and other conveyance types.
- ◆ Risk Assessment authors recommend that Federal Regulations identify how large quantities of infected carcasses will be classified for transport.
- ◆ Risk Assessment authors recommend conducting additional research and targeted experimentation on the aerosolization of FMD virus.

Current Disposal Capacity

FINDINGS

- ◆ The number of animals that can be disposed of in a landfill or rendering facility in a short period is limited by operational constraints, such as amount of labor, space, and equipment available to collect, load, transport and unload the material.
- ◆ It is unlikely that landfills and renderers would be willing to commit total capacity to carcass management because of routine contracts, so even the reported capacity may not be available for emergency response to a livestock incident.
- ◆ Landfill and rendering facility operators contacted expressed reluctance to accept FMDv infected carcasses due to public perception and business continuity concerns.
- ◆ The beef cattle region reported 190 landfills that stated an ability to accept carcasses with a total unconfirmed capacity of 161,000 tons per week.
- ◆ The North Carolina swine production area reported 40 landfills with a total unconfirmed capacity of 144,000 tons per week.
- ◆ The beef cattle region reported 3 rendering plants and 1 processor that stated the ability to accept carcasses for a total confirmed capacity of 3,080 tons per week.
- ◆ The North Carolina swine production area reported 6 rendering plants with a total unconfirmed capacity of 31,500 tons per week.

Current Disposal Capacity

RECOMMENDATIONS

- ◆ State and industry planners should consult rendering facilities and landfills within their region pre-outbreak to determine if the facilities will accept infected carcasses during an emergency. If so, those facilities can be included in state or local carcass management plans.
- ◆ Federal and state officials should develop cleaning and disinfection protocols for rendering facilities as well as biosecurity protocols for rendering and landfill operations.

Current Storage Capacity

FINDINGS

- ◆ North Carolina reported there are not enough storage containers in their study area to store the amount of swine carcasses likely to be generated during a widespread animal disease outbreak.
- ◆ Whole livestock carcasses are not easily stacked and the entire capacity of the cold storage container will not be used due to the size and shape of the carcasses.
- ◆ Large carcasses are difficult to handle and moving them in and out of a portable or mobile storage unit would be difficult and specialized loading equipment would be necessary.
- ◆ There are 80 Cold Storage Warehouses in the five-state beef production region with a combined total capacity of 220 million cubic feet.

Current Storage Capacity

RECOMMENDATIONS

- ◆ Performers recommend calculating volume per head instead of total weight when determining cold storage capacity needed for livestock carcasses; recommend reducing the total number by 15% for allowance of whole carcasses.
- ◆ States and producers should include cold storage operators in catastrophic carcass management plan discussions to identify capacity, if carcasses will be accepted, and the type of storage that will be made available.
- ◆ State and producer carcass management plans should consider storing carcasses on-site if an animal health emergency occurs when temperatures are below freezing.

Needed Capacity

FINDINGS

- ◆ Not all states require producers to report capacities, so the exact number of livestock in the five-state cattle producing region is not known.
- ◆ The five-state cattle producing area reported 611 beef CAFOs with a combined capacity of 10.3 million animals, 214 dairy operations with a combined capacity of 1.48 million animals, and 3 other/mixed livestock CAFOs with a combined capacity of 12,200 animals.
- ◆ The North Carolina swine producing region reported 8,700,000 head of swine on an unreported number of farms.
- ◆ If strategies such as vaccination are used, the numbers of carcasses may be reduced.

Needed Capacity

RECOMMENDATIONS

- ◆ States should obtain annually updated data from their appropriate state or federal agencies because the livestock census is only performed every 5 years.
- ◆ Governments and industry should continue to develop business continuity plans for livestock producers.
- ◆ Neighboring states should collaborate to develop a regional carcass management plan to identify solutions for gaining additional carcass management capacity.

Practical Parameters for Disposal, Storage

FINDINGS

- ◆ Landfills that will accept infected livestock carcasses may have restrictions on the volume and type of livestock mortalities accepted; require special carcass preparation, handling and shipping procedures; and require additional fees.
- ◆ Stop-movement orders would have to be modified to allow transport of livestock carcasses to offsite rendering and landfiling facilities.
- ◆ Rendering and landfiling cannot occur if a state's regulations expressly prohibit landfiling or rendering of livestock carcasses, or require infected carcasses to be disposed of in a specific manner.

Practical Parameters for Disposal, Storage

RECOMMENDATIONS

- ◆ State carcass management plans should identify any specific resources that may be required for storage and carcass management (such as refrigerated storage units, ramps, loading docks, pallets, fork-lifts, grinders, Bio-Zip or similar bags, etc.)
- ◆ States should update carcass management plans and remove restrictions upon landfill and rendering disposal.
- ◆ States should evaluate available storage solutions in the event livestock carcasses cannot be disposed of in a timely manner.

Strategy to Achieve Needed Capacity

FINDINGS

- ◆ It would take 46 weeks to manage all FMD susceptible animal carcasses in five-state beef cattle producing region if all reported landfill and rendering capacity is available; most likely only a fraction of that would be available.
- ◆ It would take 7 weeks to manage all FMD susceptible swine carcasses in the North Carolina swine producing area if all reported landfill and rendering capacity is available; most likely only a fraction of that would be available.
- ◆ Several landfills and rendering facilities did not respond to the project survey, therefore exact capacities are not known.
- ◆ In the five-state beef cattle region, 96 MSW landfills and 20 SAE landfills that accept livestock carcasses have the ability to expand their operation.

Strategy to Achieve Needed Capacity

RECOMMENDATIONS

- ◆ States should verify landfill and rendering capacities periodically in order to get a more accurate idea of carcass management capacities in their state and region.
- ◆ States should develop a regional carcass management plan to address a multi-state outbreak or natural disaster requiring mass carcass management.
- ◆ State and Federal responders should utilize existing tools (Matrix, Decision Loop, Checklist, WebSoil Survey, and Disposal Calculator) to identify carcass management options in the event of a mass livestock emergency.
- ◆ Decision makers should explore alternatives to depopulation and carcass management, including; vaccination, segmented harvest in which non-infected animals from an infected premise are taken to harvest possibly prior to reaching full harvest weight. Lighter weight animals may be vaccinated with intent to harvest at maturity. Further risk analysis for all these alternatives should be pursued.

Logistical Considerations for Livestock Carcass Disposal Workshop

FINDINGS

- ◆ The majority of workshop participants reported being unprepared for an FMD outbreak.
- ◆ Participants agreed that landfill was the best off-site carcass management option due to capacity and willingness to accept FMD infected carcasses.
- ◆ Stamping out could outpace landfill capacity.
- ◆ Rendering facilities expressed reluctance to accept FMD infected carcasses due to business continuity, air quality standards, disinfection, and public perception concerns.

Logistical Considerations for Livestock Carcass Disposal Workshop

RECOMMENDATIONS

- ◆ States and industry should coordinate on developing plans ahead of an outbreak.
- ◆ Vaccination should be explored as a primary option to mitigate depopulation, transport and carcass management issues during an outbreak.
- ◆ Need to determine and establish adequate decontamination process for cleaning rendering facilities and equipment used during an outbreak before it occurs.
- ◆ Feedyards should investigate regulatory pre-approval for on-site carcass management areas.
- ◆ A dialogue needs to be started with renderers, landfill facilities and National Guard in order to identify and address capability gaps.
- ◆ USDA should evaluate indemnification, compensation, and condemnation guidelines to ensure they are as fair and equitable as possible.

Rendering and Landfill Capacity Workshop

FINDINGS

- ◆ There is no guarantee that rendering plant owners or operators will accept infected livestock carcasses.
- ◆ Most rendering facilities operate five or six days a week and many facilities are able to increase their overall capacity up to a certain percentage.
- ◆ Disposing of disease-free livestock carcasses resulting from a mass-mortality natural disaster presents fewer obstacles than disposing of infected carcasses after a FMD outbreak.
- ◆ Livestock carcasses could potentially be pretreated with a virucidal agent prior to disposal at a landfill.
- ◆ Decomposed livestock carcasses may require processing with absorbent material prior to landfill disposal, resulting in additional cost.

Rendering and Landfill Capacity Workshop

RECOMMENDATIONS

- ◆ States need to develop Standard Operating Procedures for rendering and landfill carcass management.
- ◆ States need to cooperatively develop Memorandums of Understanding with landfill and rendering operators for the use of their facilities for livestock carcass management in FMD outbreaks and natural disasters.
- ◆ Rendering facility and landfill locations and capacities should be incorporated into state plans and updated periodically.
- ◆ Cleaning and disinfection protocols for rendering facilities and landfills are needed.
- ◆ Carcass pre-treatment methods to reduce or eliminate virus prior to transport should be investigated.

Transporting Infected Carcasses Workshop

FINDINGS

- ◆ Current USDOT regulations do not adequately address bulk transport of infected carcasses.
- ◆ Transporting infected livestock carcasses from affected areas to areas outside of the outbreak could cause jurisdictional challenges.
- ◆ If infected livestock carcasses are classified as hazardous material, none of the carcass haulers would have the necessary credentials to transport material classified as infectious.
- ◆ Permitting could be used to establish and maintain accountability during transport.

Transporting Infected Carcasses Workshop

RECOMMENDATIONS

- ◆ Implement biosecurity and safety protocols at points of origin, destination, and all points in between for movement of infected livestock carcasses during an animal disease outbreak.
- ◆ Evaluate pre-treatment of carcasses with a disinfectant prior to shipment, such as a liquid spray or foam providing an additional layer of protection.
- ◆ Conveyances transporting infected livestock carcasses must be leak-resistant to prevent liquids from leaking out of the conveyance during transport.
- ◆ USDOT and USDA should collaborate to clarify material classification and permitting for bulk transport of livestock carcasses.

North Carolina Carcass Management & Disposal Workshop

FINDINGS

- ◆ NC soils may not be suitable for burial but the option requires further soil and hydrology studies.
- ◆ On-site burial requires the property owner to disclose burial and could have a long-term cleanup liability.
- ◆ A stop movement order prevents farms from obtaining feed and marketing livestock, resulting in animal welfare issues such as overcrowding and starvation.

North Carolina Carcass Management & Disposal Workshop

RECOMMENDATIONS

- ◆ Further soil and hydrology studies are needed to determine on-site burial suitability in North Carolina.
- ◆ Need to develop on-site burial protocols.
- ◆ Consider a managed movement program in lieu of stop movement to minimize welfare slaughter activity.
- ◆ Recommend building map overlays for each state displaying farms and adjacent landfills, rendering plants and burial options.

National Workshop on Carcass Management Logistics

FINDINGS

- ◆ The current number of swine in Wisconsin, Iowa, California, Minnesota and North Carolina exceeds carcass management capacities.
- ◆ The USDOT regulations for infectious materials do not address the bulk transport of potentially infected carcasses.
- ◆ Current regulations (USDOT and EPA) require the use of a Uniform Hazardous Waste Manifest, a paper document that is unfamiliar to animal health responders.
- ◆ Many states have outdated regulations or livestock carcass management plans.

National Workshop on Carcass Management Logistics

RECOMMENDATIONS

- ◆ Need clear guidance from USDOT regarding the bulk transport of infected carcasses; do not recommend classifying carcasses as hazardous waste.
- ◆ Recommend finding an alternative to the Uniform Hazardous Waste Manifest, such as modifying the VS-127 for bulk carcass transport, or developing a new permit for national use.
- ◆ Recommend states develop MOU's to facilitate depopulation and carcass management.
- ◆ States need to update their response plans and regulations for FMD outbreak.

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APPENDIX B: ACRONYMS AND GLOSSARY

3D	Depopulation, Disposal, and Decontamination
AAR	After Action Report
AC	Area Command
APHIS	Animal and Plant Health Inspection Service
AVIC	Area Veterinarian in Charge
BNSF	Burlington Northern and Santa Fe
BNSF RR	Burlington Northern and Santa Fe Railroad
BSE	Bovine spongiform encephalopathy
CAFO	Concentrated Animal Feeding Operation
CBR	Chemical, Biological, Radiological
CDA	Colorado Department of Agriculture
CDC	Centers for Disease Control
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CO	Colorado
DHS	U.S. Department of Homeland Security
DOI	Department of Interior
USDOT	U.S. Department of Transportation
EMRS II	Emergency Management Response System II
EPA	U.S. Environmental Protection Agency
FAD	Foreign Animal Disease
FADD	Foreign Animal Disease Diagnostician
FADDL	Foreign Animal Disease Diagnostic Laboratory
FEMA	Federal Emergency Management Agency
FMCSA	Federal Motor Carriers Safety Administration
FMD	Foot and Mouth Disease
FMDv	Foot and Mouth Disease virus
FSIS	Food Safety Inspection Service
FSIS	Food Safety and Inspection Service
g	gram

GIS	Geographical Information System
hd	head
HHS	Department of Health and Human Services
HMWMD	Hazardous Materials and Waste Management Division
ICS	Incident Command System
KDA	Kansas Department of Agriculture
KDHE	Kansas Department of Health and Environment
KS	Kansas
MOU	Memorandum of Understanding
MS	Microsoft
MSW	Municipal Solid Waste
MSW	Municipal Solid Waste
NAHEMS	National Animal Health Emergency Management System
NASS	National Agricultural Statistics Service
NBP	National Best Practices
NCBA	National Cattlemen's Beef Association
NCDA&CS	North Carolina Department of Agriculture and Consumer Services
NM	New Mexico
OIE	World Organization for Animal Health, Office International des Epizooties
OK	Oklahoma
PCII	Protected Critical Infrastructure Information Program
PFU	Plaque-Forming Unit
PO	Post Office
PPE	Personal Protective Equipment
PRPC	Panhandle Regional Planning Commission
RR	Rural Route
RRAP	Regional Resiliency Assessment Program
S&T	Science & Technology
SME	Subject Matter Expert
SNL	Sandia National Laboratory

SOP	Standard Operating Procedure
SPRS	Surveillance, Preparedness and Response Services
SPSS	Statistical Package for the Social Sciences
TAHC	Texas Animal Health Commission
TCEQ	Texas Commission on Environmental Quality
TCFA	Texas Cattle Feeders Association
TX	Texas
TXDOT	Texas Department of Transportation
UASI	Urban Area Security Initiative
UC	Unified Command
UK	United Kingdom
US	United States of America
USDA	United States Department of Agriculture
USDA APHIS VS	United States Department of Agriculture Animal and Plant Health Inspection Service – Veterinary Services
USDA FAD PreP	United States Department of Agriculture Foreign Animal Disease Preparedness and Response Plan
USPS	United States Postal Services
VS	Veterinary Services
WTAMU	West Texas A&M University
yd	yard
µm	Micrometer

Animal Product	Blood or any of its components, bones, bristles, feathers, flesh, offal, skins, and any by product containing any of those components that originated from an animal or bird.
Bio-Zip™	Bio-containment bags which are constructed of a thermally-bonded layering of polypropylene and featuring an industrial zippering system, The Bio-Zip™ Sealable Liners fit securely inside industrial roll-off containers, trailers or truck racks from 10 to 40 cubic yards in total volume. They are used to manage large volume biological and organic waste streams and the associated odor, leakage, disease and environmental contamination issues.
Carcass	The body of an animal that has died or been killed, and is not being slaughtered for human or animal consumption.
Decomposition	The process by which organic substances are broken down into simpler forms of matter.
Dump Truck	A standard dump truck is equipped with an open-box bed, which is hinged at the rear and equipped with hydraulic pistons to lift the front, allowing the material in the bed to be deposited on the ground behind the truck at the site of delivery. The truck does not have a sealed tailgate.
Hazardous Material	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 of 49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in part 173 of subchapter C of this chapter.
Infected	Includes all stages of disease (L+I+C): latent (L), pre-clinically infected (I) and clinically infected (C).
Infected premises	Premises where a presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, case definition, and

international standards

Leachate	Liquid that is produced by the decomposition of livestock carcasses and seeps from the carcasses.
Leakage	The body fluids that have the potential to leak from the intact carcass post-mortem. These include feces, urine, stomach/rumen contents, blood, saliva, and milk spillage.
Leak-Proof Liner	A temporary durable sheet lining (made of plastic, vinyl, etc.) placed in the container of the truck and used to protect the bed and sidewalls of the cargo space of truck trailers.
Premises	A location where livestock are raised, housed, or pass through during commerce.
Rendering truck	Tractor-trailer truck with detachable trailer box and a leak-proof tailgate specifically designed for rendering. Trailer specifications can vary in length from 26 to 40 feet (most common are 28, 32 and 40 feet) with standard width of 8 feet and height of 12 feet.
Roll-Off Truck	Tractor-trailer truck with detachable box trailer which is able to be removed from the trailer component. They are characterized by a rectangular footprint, utilizing wheels to facilitate rolling the trailer in place. The open top container is designed to be transported by special roll-off trucks. As the roll-off truck raises its hydraulically operated bed, the roll-off container rolls off of the bed. A cable is used to slowly lower the container. These can operate on a winch system or a hook-lift system.
Saprophytic decomposition/putrefaction	One of the stages of decomposition, produced mainly by the action of bacterial enzymes, mostly anaerobic organisms derived from the gastrointestinal tract, causing hemolysis, disintegration of tissue, and gas formation in blood vessels and tissue spaces.
Spillage	Seeping of carcass fluids from the carcass to the truck and then to the environment.
Stamping out	Depopulation of clinically affected and all presumed exposed susceptible animals.

Survey Monkey

Is an online survey company that provides free, customizable surveys, as well as a suite of paid back-end programs that include data analysis, sample selection, bias elimination, and data representation tools.

Susceptible

Healthy animal likely to be exposed to the virus.

Tarp

A sheet of material, such as waterproofed canvas, vinyl coated polyester mesh, etc. which is used to cover the open trailer to protect contents from visibility or ejection of material.

Truck

A vehicle or conveyance used for the transportation of carcasses.

APPENDIX C: CARCASS MOVEMENT PERMIT TEMPLATE

See next page

[INSERT STATE] CARCASS MOVEMENT PERMIT

1. Date: _____ Time: _____ AM ☐ PM ☐ Interstate movement ☐ Intrastate Movement ☐
2. Vehicle/: _____ / _____ / _____ / _____ / _____ / _____
Trailer (make & model) (tag #) (state) (make & model) (tag #) (state)
3. Vehicle USDOT #: _____ Driver's license#: _____ State: _____
4. Driver: _____
(name, phone, street address, city, state, clear physical directions if no physical address)
5. Animal health/shipping document, issuing state and associated document number: _____

6. Load contents Carcasses: ☐ Infected ☐ Non-Infected
7. Origin premises ID#: _____ Destination premises ID#: _____
8. Origin: _____
(name, phone, street address, city, state, clear physical directions if no physical address)
9. Destination: _____
(name, phone, street address, city, state, clear physical directions if no physical address)

10. Has the container undergone inspection for

Leakproof ☐ Air Tight ☐ Identification ☐ Inspector: _____

Signature: _____

Undergone Decon at Point of Orgination? Yes ☐ No ☐

11. Waivers for transport: _____

12. Route to destination: _____

13. _____
Signature of driver Printed name of driver

By signing this document the driver acknowledges and agrees to abide by the requirements of this permit.

Disobeying requirements of this movement permit may result in a fine and/or imprisonment.

For questions regarding this permit, please contact [INSERT STATE CONTACT AND PHONE #]

Movement Control Order Version: _____

Permit Number: [pre-printed &

sequential]

14. _____

Signature of issuer

Printed name of issuer

Distribution: White to issuer

Blue to state

Yellow to transporter

Green to _____

EMERGENCY MOVEMENT PERMIT

----INSTRUCTIONS----

1. Date and arrival time at checkpoint, check AM or PM. List the highway, mile marker and the checkpoint name.
2. Enter the vehicle make and model, its license tag number and the state of licensure; then enter the same series of information for the trailer, if the vehicle is towing a trailer.
3. Enter the vehicle's USDOT number, the driver's license number and state. Companies that operate commercial vehicles transporting passengers or hauling cargo in interstate commerce must be registered with the Federal Motor Carrier Association and must have a USDOT Number. The following states require all registrants of commercial motor vehicles, even intrastate and non-Motor Carrier registrants, to obtain a USDOT Number: Alabama, Alaska, Arizona, Colorado, Connecticut, Florida, Georgia, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, New York, Nebraska, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Washington, West Virginia, Wisconsin, and Wyoming.
4. Provide contact information for the vehicle driver (name, phone, street address, city, state, clear physical directions if no physical address).
5. List the names of all animal health papers and/or shipping documents examined. Provide the name of the issuing state and any document number associated with each document reviewed.
6. Enter a description of the contents of the vehicle and/or trailer, applicable to the movement control order (e.g., animals [number and kind], feed type [hay, grain, silage, etc.], and/or equipment [livestock panels, squeeze chute, skid steer loader], etc.).
7. List the premises identification number for either the origin of the load, the destination of the load, or both if available. If there are multiple origins or destinations, list the applicable number for each.
8. List information regarding the point of origin of the load. The "point of origin" means the place where the contents of the vehicle and/or trailer were loaded. The listed information should include a contact name for the point of origin, a contact phone number, and the physical address of the location; if an address is not known, provide a written description of the location.
9. List information regarding the final destination of the load. The listed information should include a contact name for the destination, a contact phone number, and the physical address of the location; if an address is not known, provide a written description of the location.
10. Provide contact information for the owner of the load, relative to items covered by the movement control order (name, phone, street address, city, state, clear physical directions if no physical address).
11. Must be answered "Yes" or "No." If "Yes," the load must be diverted to the temporary holding area/diversion site for the checkpoint. Answer "Yes" or "No" for "proceed to an offload site." List the name or other identification for the offload site. The driver may require an escort to the holding area/diversion site.
12. Indicate if the load should return to its point of origin or if it can proceed to its intended destination. This decision will be based on the criteria specified in the movement control order. The appropriate check-box must be "checked" for each question. At the end of the screening process, list the checkpoint departure time in the box to the left of Question 12.

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13. List a description of the planned route of travel, either the return to the point of origin, or to the original destination. Drivers who must return to their points of origin should be encouraged to return over the same route that brought them to the checkpoint.
14. Have the driver sign the permit and emphasize that by signing the permit the driver understands the conditions under which the permit was issued, the requirements of the permit and the possible penalties for violating the permit.
15. Print and sign your name, as issuing agent.

**IF YOU, THE ISSUER, HAVE ANY QUESTIONS REGARDING INTERPRETATION
OR THE APPLICATION OF THE CONDITIONS OF THE MOVEMENT CONTROL
ORDER, CONTACT THE STATE ANIMAL HEALTH OFFICIAL FOR
CLARIFICATION OR GUIDANCE.**

Distribution: White to issuer
to _____

Blue to state

Yellow to transporter

Green

