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Managed Movement of Cattle in the U.S. in a Foot and Mouth Disease Outbreak

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Purpose

The overall goal of a Secure Beef Supply (SBS) Plan is to maintain continuity of business (COB) for beef producers, transporters and processors in a Foot and Mouth Disease (FMD) outbreak and to provide a continuous supply of safe and wholesome beef products for consumers. This Working Group's goals are to develop recommendations for managing movement of cattle and supplies in a manner that maintains COB of the beef industry while also reducing the risk of spreading the FMD virus.

The purpose of this document is to provide guidance to those tasked with making decisions regarding movements of animals and supplies in the beef industry during an FMD outbreak. This document will also highlight movement issues that warrant further discussion to facilitate disease outbreak planning and preparation efforts.

Introduction

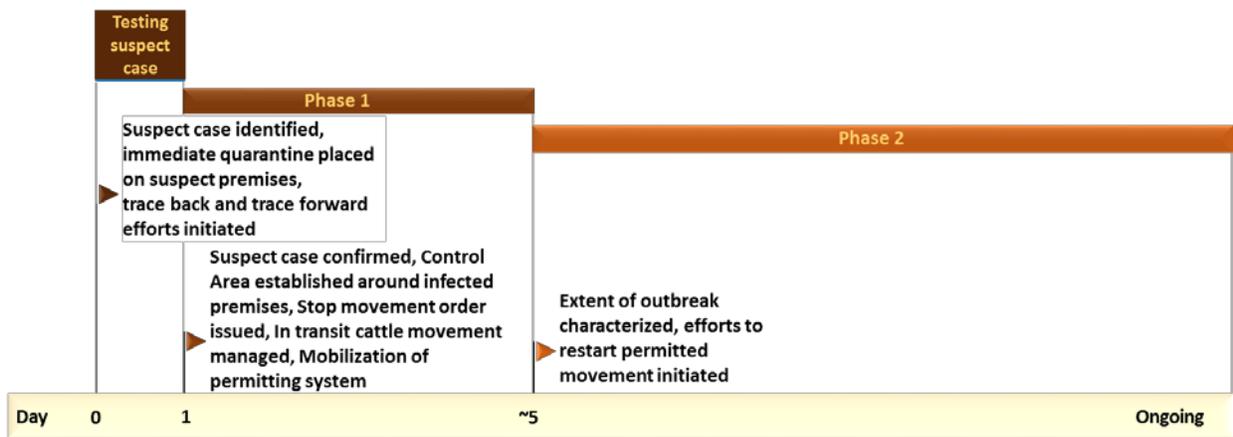
At the beginning of an FMD outbreak, or with a small outbreak, the highest priority is to take all measures possible to prevent disease spread, to stamp out the disease as rapidly as possible and to reestablish the United States as an FMD free country. In an extensive outbreak of FMD, the highest priority is to ensure a secure food supply for the nation and business continuity for food animal producers and associated industries. In an extensive outbreak, it will not be possible to stamp out all infected herds, especially on premises with large numbers of animals. It will be critical to appropriately manage movement of cattle and associated animal products to prevent the virus from spreading to other premises and facilitate recovery and return to FMD-free status.

With a total inventory of 98.4 million cattle (USDA, July 1, 2015), the U.S. has a robust cattle population and significant movements of cattle occur daily. The beef industry in the U.S. has many different types of settings for different production phases (e.g., cow-calf ranches, stockers, backgrounders, feedlots) and the dairy industry also provides a significant number of animals for beef harvest. Extensive movement of animals occurs between these different types of production phases through a variety of marketing channels. At any given time, approximately 13 million head (14%) of the total cattle inventory are being fed in feedlots¹. Approximately 100,000-125,000 head per day complete the finishing phase in feedlots and are transported for processing at a beef packing plant².

Chronological Management of Cattle Movement

Managing the cattle movements in an FMD outbreak could be approached in a way similar to how air traffic was managed immediately after the September 11th terrorist attacks. All airline flights that had not taken off were held on the ground until the authorities could characterize the extent of the assault. Planes in the air were landed as quickly as safety allowed. Once all the planes landed safely, no new flights were initiated while the extent of the problem was assessed. Eventually, new safety protocols were put into place to allow air travel to resume in an orderly way under a heightened degree of security. This situation is similar to the goal of the SBS Plan’s managed movement in an FMD outbreak; instead of planes, authorities will be dealing with truckloads of cattle. Initially, any new “flights” will be “grounded” by a stop movement order issued by the State Animal Health Official. During that same time, there will be a need to “land the planes” by finding an acceptable destination for the trucks with cattle that are already in transit. Once the “planes are landed”, work on characterizing the extent of the outbreak and setting up a system to restart movement of cattle, feed and other livestock under a heightened degree of security can commence. In the following sections, considerations and recommendations for accomplishing these goals are outlined.

Figure 1. Timeline of Early Events in a Foot and Mouth Disease Outbreak



Constructed from information contained in the Foot and Mouth Disease Response Plan, The Red Book, 2014 and the FAD PRoP Strategy Document: Classification of Phases and Types of a Foot and Mouth Disease Outbreak and Response

The management of cattle movements in an FMD outbreak will be divided into two chronological periods separated by a period of non-movement to establish appropriate movement permitting systems (See Figure 1). Early in Phase 1, the goal will be to halt cattle movements in an orderly way within the Control Area and determine an acceptable destination for cattle already in transit (from within the Control Area) when the FMD outbreak is confirmed. During the remainder of Phase 1, the extent of the outbreak will be assessed to guide response and intervention plans. Once the initial extent of the outbreak is defined and movement permitting systems are established, the goal of Phase 2 will be to restart movements and maintain continuity of business for premises with no evidence of infection, while reducing the risk of spreading the virus.

The response approach to an FMD outbreak in the U.S. will depend greatly on the extent of the outbreak, making blanket recommendations for managing movement difficult and potentially inappropriate. This document is intended to highlight issues that each state should consider when drafting emergency preparedness plans. More information on phases (a temporal state in FMD outbreak response) and types (a categorical measure of outbreak magnitude) of an FMD outbreak can be found in the document *Classification of Phases and Types of a Foot-and-Mouth Disease Outbreak and Response* at the following URL: <http://www.cfsph.iastate.edu/pdf/phases-and-types-of-an-fmd-outbreak>.

Beginning of an FMD outbreak

The primary goal of managed movement during Phase 1 of an FMD outbreak will be to “land” cattle that are in transit from a premises within a Control Area at a destination in a manner that does not increase the risk of spreading the virus.

Once the first case of FMD is confirmed, a Control Area will be established around the infected premises¹ (see Red Book Figure 4-2, Section 4.3.1.3). Movement from the infected premises will be stopped while test results are pending as described in the FMD Red Book. Movement into and out of the Control Area will be stopped until a permitting system is established to control the risk of disease spread. Additionally, trace back and trace forward activities will identify premises (inside or outside the Control Area) that have had direct or indirect contact with the infected premises to determine their risk of infection and conduct testing. It is reasonable to assume that at the beginning (first day) of the outbreak, there will be cattle in transit that originated from inside the Control Area or from a contact premises. It is also reasonable to assume that there may be additional infected premises that have not been identified at the time the first case is diagnosed.

It is likely that state-specific movement restrictions extending beyond the Control Area will be issued during Phase 1 of an outbreak and will remain in effect until contact premises are evaluated and the extent of the outbreak can be reasonably characterized (goal of within 96 hours of first diagnosis). The authority to issue stop movement orders lies with each State Animal Health Official (SAHO). The individual states also have the authority to determine what sort of animal movement will be allowed to enter as well as move within their state. A survey distributed by the United States Animal Health Association in 2015 to all SAHOs indicated that 23 of the 27 (85%) respondents would immediately establish checkpoints at their state’s borders to stop livestock movement and evaluate the source risk of the shipment. They would then determine whether to allow the shipment to continue to its destination or return to its origin. If the shipment is not able to continue to its destination nor return to its origin, a few states (3/27) indicated they have made preparations to establish temporary quarantine sites within their states. The border checkpoints and temporary quarantine sites are meant to be short term management strategies. They are only intended to exist until shipments originating from a Control Area or contact premises that are already in transit reach a destination. Once the shipments from these areas that were in transit when the stop movement order was issued have reached a destination, no new movements from within the Control Area will be allowed during Phase 1.

¹ An Infected Premises (IP), as defined by the USDA, is a “premises where a presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, case definition, and international standards.”

It is advisable for all states to establish approved routes prior to an outbreak that would allow livestock movements through their state during an outbreak without increasing the risk of exposure to susceptible animals within that state.

After the first case of FMD in the U.S. is confirmed, it will be imperative to quickly alert transporters with loads of cattle in transit. Reliance on existing communication systems will be needed for effective and rapid notification of transportation companies and their drivers. Getting information to law enforcement officials, departments of transportation (digital signs), and the media should also be utilized. Consistent messages on state, federal, and industry web sites as well as state call centers will be helpful for dissemination of a unified message. The URL for the websites and the number for the call centers should be disseminated through all avenues of communication.

Concerns exist regarding the willingness of feedlots to accept shipments of cattle in Phase 1 of an FMD outbreak. Cattle movements originating from inside a Control Area and those whose origins cannot be rapidly verified are of particular concern. For auction market cattle of unknown origin, the market should be contacted to help determine origin. If feedlots will not accept movements of high risk cattle, the cattle should be returned to their movement origin if possible. If this course of action is taken, issues may arise with truckers and animals surpassing their lawful time limits for being on the road without rest or offloading. More work needs to be done to develop options for shipments of cattle that are not accepted at the feedlot for which they were originally destined. If shipments cannot return to their origin, diversion quarantine sites will be required for the cattle. Having truckloads of cattle stranded on the road without an offloading destination is unacceptable.

Similar concerns exist regarding the willingness of packing plants to accept shipments of cattle from a Control Area during Phase 1 of an FMD outbreak. If the packing plant has received any cattle movements from the infected premises or premises inside the Control Area in the previous 28 days, there will be no reason for them not to continue accepting cattle from inside the Control Area as the plant will likely already be designated as a contact premises (Table 5-1 Summary of Premises, Red Book). In this case, the packing plant would immediately need to implement cleaning and disinfection biosecurity measures for all livestock truck traffic exiting the premises as well as appropriate biosecurity measures for employees entering and leaving the premises.

FMD is not a public health or food safety concern; therefore, it is critical that packing plants continue to process cattle in order to maintain continuity of business. The meat from cattle that pass USDA Food Safety Inspection Service (FSIS) inspection is considered safe and wholesome for human consumption, even if the product originated from FMD infected but undetected cattle. Methods for inactivating the virus on/in other products, including hides, are described in The Red Book (Section 5.10.5 OIE Treatment Guidelines for FMD). Further work is needed to determine packers' current capabilities to implement virus inactivation protocols.

If a packing plant is located inside a Control Area, shipments of cattle from outside the Control Area may be allowed to enter the Control Area during Phase 1 for the packing plants to maintain continuity of business. However, all livestock truck traffic at the plant will need to adhere to established biosecurity protocols upon leaving the plant and/or Control Area. Work needs to continue to make this biosecurity requirement feasible. Additionally, regular shipments of meat products from packing plants will need to occur so that inventory space is not overloaded and plants may continue to process cattle. Further work needs to be done to assess and mitigate the risk of virus transmission to other susceptible

species posed by uncooked meat product from cattle that were sub-clinically infected. The trucks carrying meat product shipments will also need to undergo cleaning and disinfection upon leaving the plant and/or Control Area if they share traffic routes with trucks delivering live animals. Emergency cleaning and disinfection protocols will be difficult for packing plants to fully implement under current capabilities. Preparation efforts need to continue to ensure packing plants can remain in operation at an appropriate speed of commerce during an outbreak and still adhere to biosecurity protocols to prevent further disease transmission. Ideally, business plans and contracts should allow for plants within the Control Area to preferentially process cattle from within the Control Area.

Restarting movement

Once the extent of the outbreak can be reasonably estimated, the response will shift to Phase 2 (See Figure 1). The highest priority goals would be to prevent the spread of FMD virus, restart movement from areas still under a state stop movement order but outside of a Control Area, and to begin permitted movement from within designated Control Areas. The scale of the outbreak, choice of response strategy (e.g., stamping out vs. vaccination), and type of production premises affected (e.g., feedlot vs. cow-calf vs. dairy, etc.) will impact movement needs. Other sectors of the beef industry that do not maintain cattle herds, but have contact with cattle (such as cattle and feed transport) will also be impacted by movement interruptions and permitting requirements. In addition, service providers will be impacted.

Production Sites

Outside a Control Area

If a production site is outside a Control Area, cattle movements from that site will either be to another premises outside of a Control Area(s) or to a premises inside a Control Area.

- Cattle, with no evidence of infection, should be allowed to move to other premises outside of Control Areas if the movements can be completed without passing through a Control Area. Enhanced biosecurity practices are encouraged for all premises and movements.
- Cattle movements to premises that are inside a Control Area should be limited to finished cattle moving directly to slaughter. In a large ongoing outbreak, limited shipments of cattle may need to move into a Control Area in order for different production phases of the industry to maintain continuity of business. All cattle movements from outside a Control Area to inside a Control Area should be accompanied by a permit. Vaccination may be required before cattle will be permitted to move into a Control Area for a different stage of production.

Production sites outside of a Control Area will have traffic entering their premises to deliver commodities and goods, pick up finished cattle for slaughter, remove animals to be rendered and other waste products, and provide nutrition and veterinary services, as well as for other purposes. Production sites should verify vehicles have not come from inside or passed through a Control Area without undergoing appropriate cleaning and disinfection procedures before allowing entry across the Line of Separation (See the SBS Biosecurity Performance Standards.) onto the site. Enhanced biosecurity for all traffic entering a production site is encouraged for all.

Inside a Control Area

If a production site is inside a Control Area, cattle movements from that site will either be to another premises inside of a Control Area or to a premises outside of a Control Area.

- Any premises inside a Control Area that wishes to move cattle should provide documentation demonstrating a lack of evidence of infection (as described in the SBS Active Observational Surveillance materials) and meet Biosecurity Performance Standards (BPS) in order to request a movement permit.
- Any cattle movement from inside a Control Area, regardless of its destination, should be accompanied by a valid movement permit.
- Finished cattle from premises that meet the above criteria may be allowed to move directly to slaughter. If the cattle need to travel to a packing plant outside of the Control Area for processing, the driver should follow a pre-determined route to minimize risk of exposing susceptible animals to the virus.

Traffic will need to move into production sites that are inside of Control Areas. The size of the outbreak and choice of response strategy will determine what kind of movements will need to enter the Control Area. Traffic that crosses onto a livestock premises within a Control Area should be accompanied by a valid movement permit and undergo appropriate cleaning and disinfection procedures as described in the Biosecurity Performance Standards.

- For an infected premises, vehicles, equipment, and personnel needed to implement a response strategy and care for the cattle will need to enter the Control Area and premises.
- If stamping out is not being implemented, traffic to deliver feed and supplies will need to enter the infected premises.
- For premises with no evidence of infection inside the Control Area, feed and supply deliveries as well as other traffic will need to enter. Biosecurity measures need to be implemented on the uninfected premises to minimize virus entry.

Transporters

Outside a Control Area

- Transporters operating outside of a control area should be mindful of where Control Areas exist and alter routes to avoid entering or passing through Control Areas. Transporters may need to modify their normal routines to accommodate increased biosecurity requirements implemented by livestock premises working to protect their herds. Recommended biosecurity procedures for transporters can be found in the SBS Biosecurity Working Group materials.

Inside a Control Area

- Any traffic entering a premises with susceptible animals within a Control Area should be accompanied by a valid movement permit.
- Any traffic that has entered a Control Area should be assumed to have come in contact with contaminated roadways. At a minimum, the tires, wheels, and undercarriage of the vehicle should undergo cleaning and disinfection procedures before crossing a Line of Separation (LOS)

to enter any premises with susceptible species as described in the Biosecurity Performance Standards.

- Any trucks that are transporting cattle from a Control Area to slaughter plants also in a Control Area, should undergo cleaning and disinfection procedures for the trailer interior and exterior as well as the outside of the tractor following cattle delivery as outlined in the Biosecurity Performance Standards.

Processors

Outside a Control Area

- If a packing plant outside of a Control Area has received or is receiving cattle from inside one or more Control Areas, the receiving plant and any roadways that the shipments from the Control Area have traveled on should be considered to potentially be contaminated. Traffic that has entered the premises of one of these packing plants should undergo cleaning and disinfection procedures as described in the Biosecurity Performance Standards and required by Incident Command, especially before traversing a LOS at an uninfected premises. While cleaning and disinfection is important for disease control, protocols and resources to accomplish this need further development.
- If a packing plant outside of a Control Area has not received or is not receiving shipments of cattle from inside any Control Area, traffic should continue normally while keeping in mind that the status of premises, the status of shipments, and areas designated as Control Areas may change rapidly. Therefore, the packing plants should be prepared to implement cleaning and disinfection procedures as required by Incident Command in a prompt manner. These packing plants should work with transport companies to assure shipments are not traveling through Control Areas en route to the plant.

Inside a Control Area

- If a packing plant is located inside a Control Area, cattle movements should continue to the plant in order for the plant to maintain continuity of business and to get apparently healthy cattle processed as quickly as possible. This will decrease the number of naïve susceptible animals at risk of contracting FMD. If possible, packing plants within the Control Area should harvest cattle from within the Control Area.
- Cattle movement to the plant should be accompanied by a valid movement permit.
- Ideally, all trucks delivering cattle should undergo cleaning and disinfection procedures as required by Incident Command regardless of the origin of the cattle shipment. Availability of resources and weather conditions will greatly impact the logistics of implementing cleaning and disinfection procedures. Further work needs to be done to increase the capabilities of processors to meet cleaning and disinfection requirements.
- Ideally, all trucks transporting meat products from the plants should undergo cleaning and disinfection procedures for the tires, wheels, and undercarriage upon leaving the plant and/or Control Area if they share traffic routes with trucks delivering live animals. Availability of resources and weather conditions will greatly impact the logistics of implementing cleaning and disinfection procedures. Further work needs to be done to increase the capabilities of processors to meet cleaning and disinfection requirements.

- Packing plants should explore options for transporting employees to and from the plant in a manner that minimizes potential cross-contamination of personal vehicles and carrying virus on employees apparel and footwear, but also does not monopolize cleaning and disinfection resources.

Questions and Comments:

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Sources

¹ Semi-annual Cattle Inventory Summary, Ron Plain, University of Missouri,
<http://agebb.missouri.edu/mkt/bull12c.htm>

²Expert estimate reported by Lisa Pederson from the Cattle Transportation Symposium in Fort Collins, CO, 2015