

# **NAHEMS GUIDELINES: CONTINUITY OF BUSINESS**

## **FAD PReP**

**Foreign Animal Disease  
Preparedness & Response Plan**



**United States  
Department of  
Agriculture**

United States Department of Agriculture • Animal and Plant Health Inspection Service • Veterinary Services

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The Foreign Animal Disease Preparedness and Response Plan (FAD PReP)/National Animal Health Emergency Management System (NAHEMS) Guidelines provide a framework for use in dealing with an animal health emergency in the United States.

This FAD PReP/NAHEMS Guidelines are under ongoing review. This document was last updated **November 2016**. Please send questions or comments to:

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## **PREFACE**

The Foreign Animal Disease Preparedness and Response Plan (FAD PRoP)/National Animal Health Emergency Management System (NAHEMS) Guidelines provide the foundation for a coordinated national, regional, State, and local response in an emergency, complementing non-Federal preparedness activities. These guidelines may be integrated into preparedness plans of other Federal agencies, State and local agencies, Tribal Nations, and additional groups involved in animal health emergency management.

These Continuity of Business Guidelines—a component of the Animal and Plant Health Inspection Service (APHIS) FAD PRoP/NAHEMS Guidelines series—are designed for use by APHIS Veterinary Services and other official response personnel in an animal health emergency, such as the natural occurrence or intentional introduction of a foreign animal disease (FAD) in the United States. The guide provides the basis for making sound decisions regarding managed movement of non-infected animals and non-contaminated animal products in an FAD incident.

## ADDITIONAL APHIS DOCUMENTS

Several key FAD PReP documents complement the NAHEMS Guidelines: Continuity of Business and provide further details. These documents include the following:

- *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0)
- *Permitted Movement* (FAD PReP Manual 6-0)
- Ready Reference Guide—Quarantine, Movement Control, and Continuity of Business (available for highly pathogenic avian influenza and foot-and-mouth disease)
- FAD PReP/NAHEMS Guidelines:
  - Biosecurity
  - Quarantine and Movement Control
- FAD PReP Standard Operating Procedures
  - 9. Biosecurity

These documents are available at <http://www.aphis.usda.gov/fadprep>.

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## Guidelines: Continuity of Business

### 1. INTRODUCTION

In a foreign animal disease (FAD) outbreak, the three goals of a response are to: (1) detect, control, and contain the FAD in animals as quickly as possible; (2) eradicate the FAD using strategies that seek to stabilize animal agriculture, the food supply, and the economy, and to protect public health and the environment; and (3) provide science- and risk-based approaches and systems to facilitate continuity of business (COB) for non-infected animals and non-contaminated animal products.

Achieving these three goals will allow individual livestock facilities, States, Tribes, regions, and industries to resume normal production as quickly as possible. They will also allow the United States to regain FAD-free status without the response effort causing more disruption and damage than the disease outbreak itself.

An FAD outbreak would have far-reaching effects on the U.S. animal agriculture system; for example, just the loss of international trade after the initial detection of foot-and-mouth disease (FMD) will have a significant economic impact. For perspective, in 2015, the United States exported an estimated \$17.1 billion dollars in beef (\$6.3 billion), pork (\$5.6 billion), and dairy products (\$5.2 billion).<sup>1</sup>

Quarantine and movement control (QMC) activities are essential to rapidly contain an FAD, particularly those that are highly contagious. However, these activities can also cause significant disruptions in typical business operations and result in severely restricted intrastate and interstate commerce. It is difficult to quantify the economic impact of potential disruptions, but current animal agricultural production and marketing systems rely on frequent movement. Just-in-time production in the swine industry and daily movement of milk in the dairy industry means that there would be significant interruptions in these systems if movement had to be stopped for any extended period; severe consequences would result.

This Animal and Plant Health Inspection Service (APHIS) Foreign Animal Disease Preparedness and Response Plan (FAD PRoP)/National Animal Health Emergency Management System (NAHEMS) Guidelines addresses COB as part of an FAD response. The objective of COB planning is to mitigate the economic consequences of QMC during an FAD outbreak. COB employs science- and risk-based approaches to manage the movement of non-infected animals and non-contaminated animal products in order to stabilize animal agriculture, the food supply, and the economy. These approaches ease the effect of QMC while taking measures to ensure the FAD is controlled and contained.

APHIS FAD PRoP identifies COB, also known as managed movement (Box 1), as a critical activity that will be conducted during an FAD response.

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<sup>1</sup> Beef and pork statistics from the U.S. Meat Export Federation, 2016 ([http://www.usmef.org/news-statistics/statistics/?stat\\_year=2015](http://www.usmef.org/news-statistics/statistics/?stat_year=2015)). Dairy statistic from the U.S. Dairy Export Council, 2016 (<http://www.usdec.org/research-and-data/market-information/us-export-data/historical-data>).

### Box 1: Continuity of Business (Managed Movement) in an FAD Outbreak

COB is the managed movement of non-infected animals and non-contaminated animal products from non-infected premises in an FAD outbreak (what is allowed to move in a given incident depends on the disease, outbreak situation, and other factors). All movement is based on science- and risk-based approaches. This helps agriculture and food industries to maintain normal business operations but mitigates the risks of animal and product movements.

These NAHEMS Guidelines provide general information about COB. The following sections discuss

- preparedness and response goals of COB,
- authority and regulatory intervention in FAD response,
- how COB fits into an FAD response,
- creating COB plans and processes, and
- COB in emergency management.

This document provides the business case and imperative for COB as a critical activity during FAD responses. Specific guidance on how non-infected animals and non-contaminated animal products would be managed in a disease outbreak is found in commodity specific documents, collectively known as the Secure Food Supply plans (please see Section 8). Permitting information, including different types of permits, the permitting process, and other important permitting concepts, is provided in *Permitted Movement* (FAD PReP Manual 6-0).

## 2. PREPAREDNESS AND RESPONSE GOALS OF COB IN AN FAD OUTBREAK

APHIS has the following objectives for COB planning for FAD preparedness and response

- *Preparedness*
  - Work with industry stakeholders and experts to prioritize animal or commodity movements that have the potential to be affected by disease or the disease response.
  - Establish a transparent and effective system for risk assessments, surveillance requirements, biosecurity procedures, and permitting processes to promote stakeholder acceptance and compliance with regulatory interventions by State, Federal, and Tribal authorities.
- *Response*
  - Implement an appropriate COB plan for the industries or industry segments affected by the outbreak.
  - Work with industry and Incident Command to facilitate and permit movement of non-infected animals and non-contaminated animal products from non-infected premises throughout the outbreak.
  - Enter permits and movements in the Emergency Management Response System 2.0 (EMRS2) in a timely fashion, in at least 24-hour intervals.

## 3. REGULATORY INTERVENTION IN AN FAD OUTBREAK

In an FAD outbreak, regulatory intervention at the Federal, State, Tribal, local, or industry level may occur. The scope of regulatory intervention will be influenced by the following:

- *Consequences of the outbreak.* The impact of the outbreak and the response effort, in terms of disruption to interstate commerce and international trade; threat to national security, food security, animal health, the environment, and the economy; and regulatory impact.
- *Acceptance.* Acceptance of response policy (social and political) by different stakeholders, from local to international.

- *Scale of the outbreak.* The number of animals infected, species infected, number of premises affected, and susceptible animal population density for infected areas or areas at high-risk of becoming infected with the disease.
- *Rate of outbreak spread.* The rate of spread of infection in terms of number of premises, types of premises, number of animals, and types of animals; rate at which each Infected Premises (IP) leads to infection of one or more additional IP.
- *Veterinary countermeasures available.* The availability and efficacy of veterinary countermeasures, including vaccines.
- *Resources available to implement response strategies.* The capabilities and resources available to eradicate the disease in domestic animals and to control and eradicate the disease in potential wildlife reservoirs.

### 3.1 Quarantines and Movement Controls

Quarantines and movement controls are an important regulatory intervention to control and contain an FAD. In an incident, State and/or Federal quarantines may be implemented. Federal quarantines and movement restrictions may be instituted to prevent disease transmission and to control *interstate* and *international* movement of infected animals and contaminated animal products.<sup>2</sup> States implement State quarantines to prevent disease transmission, and may restrict the *intrastate* movement of animals, animal products, equipment, and other items. Typically, a State will quarantine an IP, and the State and/or Unified Incident Command will establish a Control Area—where movement controls are implemented—around that IP. If a Federal quarantine is implemented (Federal quarantines may or may not be established), the Federal quarantine area is commonly the Control Area. For more information on quarantines and movement controls, please see the *NAHEMS Guidelines: Quarantine and Movement Control*.

### 3.2 Regionalization

Depending on the disease and scope of the outbreak, the United States and/or individual States may use regionalization. Disease-free regions or areas can be identified to facilitate interstate and intrastate trade and potentially reopen U.S. international markets. Each trading partner may decide whether or not to regionalize the United States (accepting imports from areas/regions/zones outside of the affected county/State/region) or ban U.S. exports from the entire country. In some cases, agreements are made to this effect with bilateral trading partners in advance of an outbreak.

## 4. AUTHORITIES

The Code of Laws of the United States of America (U.S.C.) and the *Code of Federal Regulations* (CFR) are codified authorities representing different stages of the legislative process. The U.S.C. provides the general and permanent statutes of the United States, which are passed by Congress and signed by the President. Executive branch agencies then interpret the U.S.C., developing detailed regulations in the CFR. The CFR is developed through a public rulemaking process, where the public is allowed to comment. For more information, please see the *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0).

In an FAD incident response, the U.S.C. and CFR provide policy, via statutes and regulations, for the United States Department Agriculture (USDA); interim regulations can be implemented—in the event of an outbreak—to prevent the spread of disease.

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<sup>2</sup> Federal quarantines were not issued in the highly pathogenic avian influenza (HPAI) 2014–2015 outbreak, which was the worst FAD outbreak in U.S. history.

## 4.1 USDA APHIS Authorities for Foreign Animal and Emerging Diseases

An FAD is a terrestrial animal disease or pest, or an aquatic animal disease or pest, not known to exist in the United States or its territories (please see *APHIS FAD Framework: Response Strategies [FAD PReP Manual 2-0]* for more information). An emerging animal disease is any terrestrial animal, aquatic animal, or zoonotic disease not yet known or characterized, or any known or characterized terrestrial animal, aquatic animal disease in the United States or its territories that changes or mutates in pathogenicity, communicability, or zoonotic potential to become a threat to terrestrial animals, aquatic animals, or humans. An FAD or emerging animal disease may involve livestock, poultry, other animals, and/or wildlife.

On July 2, 2014, APHIS published *Veterinary Services (VS) Proposed Framework for Response to Emerging Animal Diseases in the United States* for responding to such incidents. This document is available at [https://www.aphis.usda.gov/animal\\_health/downloads/vs\\_emerging\\_diseases\\_framework.pdf](https://www.aphis.usda.gov/animal_health/downloads/vs_emerging_diseases_framework.pdf). This document complements the National List of Reportable Animal Diseases (NLRAD), which proposes a single, standardized list of reportable animal diseases and who will be responsible for reporting. It is likely this list will be published in a proposed rule, establishing a new part in Title 9 of the CFR. More information on the NLRAD is available here: [https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/program-overview/ct\\_national\\_list\\_reportable\\_animal\\_diseases](https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/program-overview/ct_national_list_reportable_animal_diseases).

In the event of an FAD or emerging animal disease outbreak in domestic livestock that involves wildlife, USDA APHIS will work in close collaboration, communication, and coordination with State, Tribal, and Federal wildlife agencies that have primary jurisdictional authority and subject matter expertise for wildlife.

For information on the procedures for an FAD investigation and specimen submission, including for Foreign Animal Disease Diagnosticians, please see *VS Guidance Document 12001* (previously APHIS Veterinary Services Memorandum 580.4) and the *Foreign Animal Disease Investigation Manual* (FAD PReP Manual 4-0).

### 4.1.1 Animal Health Protection Act

APHIS receives its permanent and general regulatory authority from the Animal Health Protection Act (AHPA), 7 U.S.C. 8301 *et seq.*

The AHPA enables the Secretary of Agriculture to prevent, detect, control, and eradicate diseases and pests of animals, including foreign animal and emerging diseases, in order to protect animal health, the health and welfare of people, economic interests of livestock and related industries, the environment, and interstate and foreign commerce in animals and other articles. The term “animal” means any member of the animal kingdom (except a human), 7 U.S.C. 8301-8302. The Secretary is specifically authorized to carry out operations and measures to detect, control, or eradicate any pest or disease of livestock, which includes poultry, 7 U.S.C. 8308, and to promulgate regulations and issue orders to carry out the AHPA (7 U.S.C. 8315). The Secretary may also prohibit or restrict the importation, entry, or interstate movement of any animal, article, or means of conveyance to prevent the introduction into or dissemination within the United States of any pest or disease of livestock (7 U.S.C. 8303-8305).

### 4.1.2 Code of Federal Regulations

Title 9 of the CFR provides detailed USDA APHIS administrative regulations for the control and eradication of animal diseases, including FADs and emerging animal diseases. Below are several key sections of the CFR to safeguard public health, animal health, animal products, interstate commerce, and

international trade. Please refer to the *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PRoP Manual 1-0) for more information:

- 9 CFR 71.2—Secretary (of Agriculture) to Issue Rule Governing Quarantine and Interstate Movement of Diseased Animals, Including Poultry
- 9 CFR 71.3—Interstate Movement of Diseased Animals and Poultry Generally Prohibited
- 9 CFR 53—Foot-and-Mouth Disease, Pleuropneumonia, Rinderpest, and Certain Other Communicable Diseases of Livestock or Poultry
- 9 CFR 161—Requirements and Standards for Accredited Veterinarians and Suspension or Revocation of Such Accreditation

## **4.2 State Authority in an FAD Outbreak**

FAD response and execution of QMC will involve State, Tribal, and local authorities and resources. Authority granted to the State Animal Health Official (SAHO) varies from State to State. Legal authority is granted via statute by a legislating body, and regulations are promulgated by an executive agency under this statutory authority. Quarantine on a premises—or movement restrictions—within a Control Area may be issued based on an FAD detection or a suspected FAD. These may include quarantines of an individual pen, herd, flock, premises, county, section, or area, depending on the specific State authority. Since statutes and regulations vary by State, it is important to become familiar with and follow the laws and regulations of your State, Tribal Nation, and/or locality. State quarantines are used to stop and control the spread of an infectious or contagious disease within a State.

## **4.3 Extraordinary Emergency**

An FAD outbreak in the United States often results in emergency regulatory intervention by State, Tribal Nations, and Federal authorities via a Unified Incident Command. While typically States control intrastate movements, it is important to recognize that if the U.S. Secretary of Agriculture declares an Extraordinary Emergency, the Federal government is then authorized to control intrastate movement, in addition to interstate movement and international movement. Please note in the highly pathogenic avian influenza (HPAI) outbreak in 2014–2015, the largest animal health incident ever in the United States, there was no Federal emergency declaration of any type.

# **5. CONTINUITY OF BUSINESS AS PART OF AN FAD RESPONSE**

## **5.1 Critical Activities**

During an FAD response, many activities must be conducted simultaneously. Box 2 lists some of the critical activities which occur in an FAD outbreak, including COB. Other activities, such as surveillance, diagnostic testing, QMC, disposal, and vaccination will also help to rapidly and effectively control, contain, and eradicate the disease.

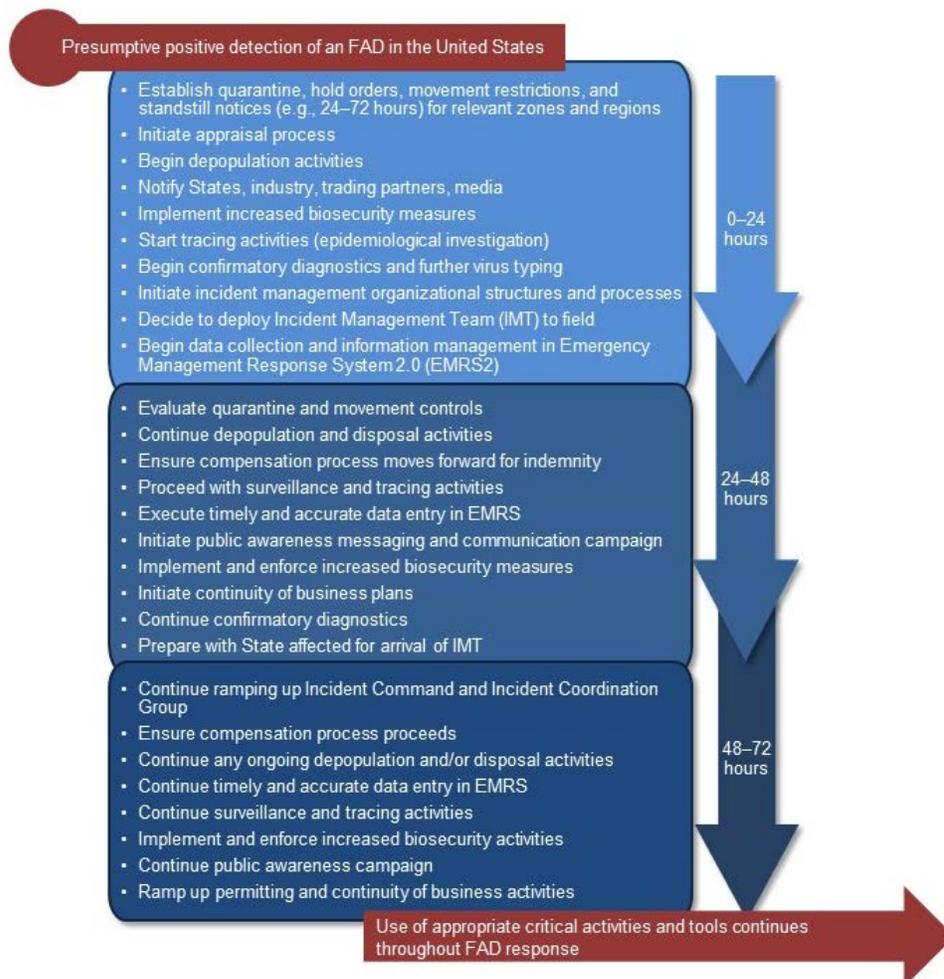
## Box 2: Critical Activities and Tools for an FAD Response

### Critical Activities and Tools for Containment, Control, and Eradication

- Public awareness campaign
- Swift imposition of effective QMC
- Rapid diagnosis and reporting
- Epidemiological investigation and tracing
- Increased surveillance
- COB measures for non-infected animals and non-contaminated animal products
- Biosecurity measures
- Cleaning and disinfection measures
- Effective and appropriate disposal procedures
- Mass depopulation and euthanasia (as response strategy indicates)
- Emergency vaccination (as the response strategy indicates)

Figure 1 shows the critical activities that will take place within the first 72 hours of an outbreak. These critical tasks are fundamental to the rapid control and containment of the disease.

**Figure 1. Critical Activities in the First 72 Hours of an FAD Outbreak**



## 5.2 Understanding the Difference between COB and QMC

The purpose of QMC is to contain any FAD and keep the disease agent from affecting non-infected livestock and poultry populations (e.g., herds, flocks, or other groups of animals) to stop disease transmission. Ultimately, containing the FAD leads to control and eradication. QMC stops or severely limits the movement of animals, products, fomites, vehicles and equipment. Whether a premises is inside a Control Area or outside a Control Area, QMC can affect the ability of a producer or processor to continue key operations during an outbreak. Business processes, including the production and distribution of high-quality food products, may be disrupted.

COB, on the other hand, manages the movement of non-infected animals and non-contaminated animal products in a regulatory Control Area and facilitates movement into, within, and out of the Control Area. This managed movement involves the development and implementation of science- and risk-based systems and protocols to help agriculture and food industries maintain essential business functions, or return to business during an FAD response, while the risk of disease spread and threat to public health, as applicable, is effectively managed. Limiting the impact of an FAD outbreak on producers not directly affected by the outbreak is a critical function of COB during an outbreak response. The ultimate goal of COB is to minimize unintended negative effects of the disease and disease response on the affected industries and consumers while still achieving the goals of a disease response.

Box 3 explains how QMC and COB (managed movement) are integrated in an FAD outbreak; Figure 2 provides an illustration of how the activity may change as the outbreak progresses. QMC and COB both help to achieve the goals of an FAD response.

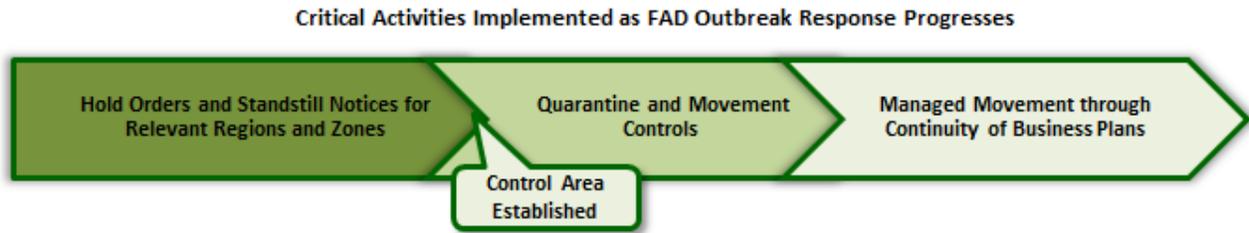
### Box 3: Quarantines, Movement Controls, and Continuity of Business (Managed Movement)

#### How does COB Work with QMC?

Quarantines, movement controls, and COB have the same ultimate goal: to prevent the transmission of the FAD to non-infected premises, particularly those outside the Control Area. While quarantines and movement controls are highly effective at limiting the spread of disease, they also impede typical business operations—this is when COB plans enter into response efforts to effectively manage movement.

- **Quarantines and movement controls** are applied to premises in the regulatory Control Area to ensure infected animals, fomites, and products do not leave premises. Quarantines are applied to Infected, Contact, and Suspect Premises. Movement controls are applied to At-Risk and Monitored Premises. Consideration will be given to critical movements (i.e., feed trucks).
- **COB or managed movement** is intended to manage movement for the non-infected premises (At-Risk and Monitored Premises) in a regulatory Control Area, and to facilitate movement within and out of the Control Area.

**Figure 2. Progression of Activities during an FAD Outbreak**

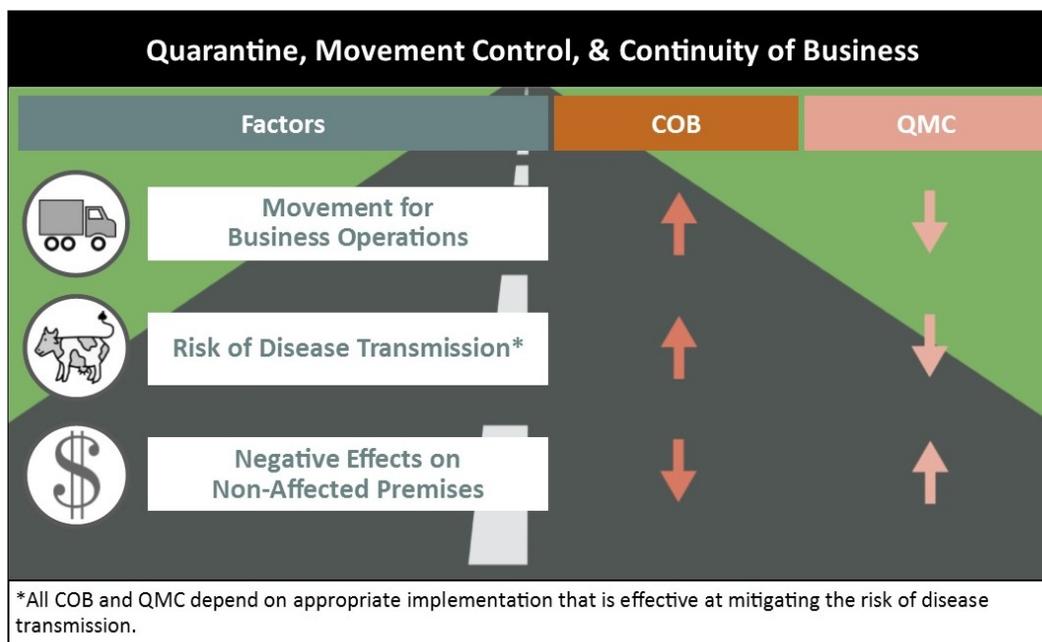


Transitioning between these phases requires effective preparedness planning ahead of an event between all relevant partners.

### 5.3 Competing Priorities and Interests

COB is not a standalone activity in an FAD outbreak. To be successful, COB must be integrated with other elements of an incident response. There are many activities that compete for limited resources in an event; a major challenge in preparing for and responding to FAD outbreaks is successfully managing these interests during the response. A priority of preparedness planning should be to discuss, mitigate, and work to resolve competing priorities prior to an incident. This can be accomplished by identifying required resources, establishing mutually accepted response goals and objectives, and increasing the awareness of these competing priorities. As each different animal agriculture sectors develop their disease specific COB plans, it is critical that incident goals, guidelines, strategies, and procedures are coordinated with Federal, State, Tribal, and local planning efforts.

**Figure 3. Relationship between QMC and COB**



## 6. COB PLANS FOR MANAGED MOVEMENT: CREATING THE PLANS AND PROCESSES

### 6.1 Key Elements

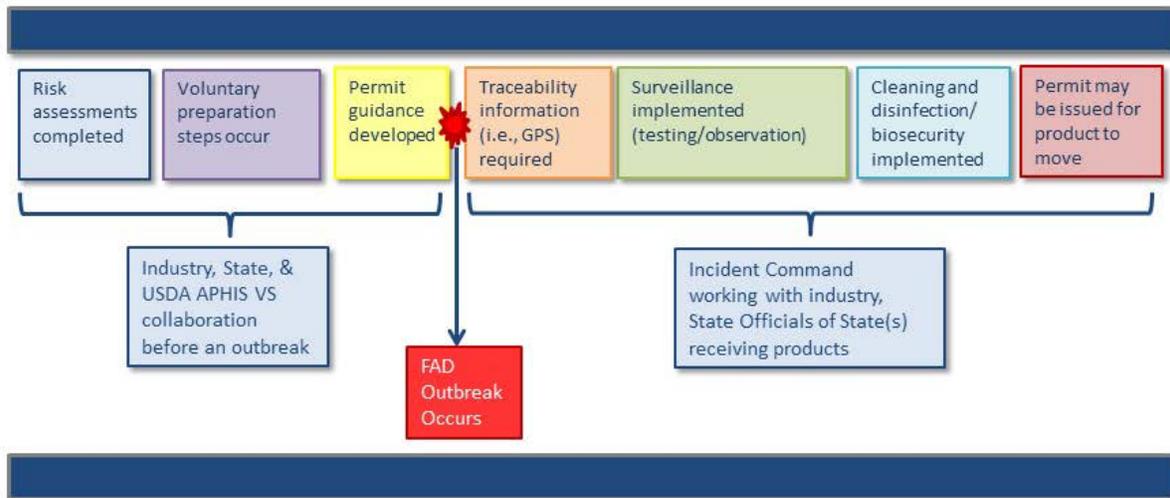
To effectively manage movement of non-infected animals and non-contaminated animal products from a regulatory Control Area, there are several common elements which are needed in a COB plan or procedure. Please note that every COB plan will be unique, depending on the disease agent, industry, and/or commodity in question. However, commonalities include the following:

- *Risk assessments:* Proactive risk assessments help determine the transmission risk of product movement, particularly from an infected but undetected premises, herd, or flock.
- *Surveillance requirements:* Sampling frequency, population to be sampled, and duration of sampling required for movement.
- *Biosecurity guidance:* Appropriate precautions, personal protective equipment, and specific steps for various fomites and equipment before, during, and after movement of animals or commodities.
- *Cleaning and disinfection (virus elimination) procedures:* Cleaning requirements for various fomites and equipment, including information on appropriate disinfectants.
- *Epidemiological and premises information:* Information on movement to and from premises, as well as number of animals, species, their age, and the geographic location of the premises.
- *Permitting guidance:* Transparent, explicit, succinct guidance for Incident Command on movement requirements for various commodities, including options if applicable.
- *Information management:* Effective, scalable, and flexible information systems that facilitate situational awareness and data sharing among all partners in a COB plan.

To move non-infected animals and non-contaminated animal products in a disease outbreak from a regulatory Control Area, specific biosecurity guidelines, repeated diagnostic tests, and other measures may be required. These measures provide a high degree of confidence that movement will not increase the risk of disease transmission, to protect animal health, public health, and the food supply. These biosecurity, cleaning and disinfection, surveillance, and diagnostic requirements will be based on the best available science and proactive risk assessments. This will help to assure consumers, producers, responders, and other stakeholders that virus is not being transmitted between premises.

All parties involved in COB must realize and accept the responsibilities associated with movement during an outbreak. There is a risk—however slight—from a COB movement, even though the benefit of continuing business far outweighs this risk. By participating in COB plans and procedures, producers are agreeing to abide by any policies and procedures for such movement and cooperate with the State and/or Unified Incident Command regarding meeting the requirements for COB movements. Figure 3 illustrates how COB plans work.

**Figure 4. How Continuity of Business Works**



GPS = global positioning system

## 6.2 Collaboration in Plan-Making

COB is a complex and multidisciplinary effort. It requires successful collaboration and cooperation between regulators, academia, and the private sector to create plans and processes for facilitating the movement of animals and commodities from non-infected premises. Because of competing interests and different priorities for limited resources, collaboration is critical for successful COB planning. For example, the regulatory objective of containing and eradicating the outbreak as quickly as possible may be in direct conflict with producers with non-infected premises who want to move products to further processing or market. Working together in an iterative and cooperative process increases the likelihood that COB plans will be successful in an outbreak. Box 4 discusses this collaboration.

### Box 4: Continuity of Business as a Collaborative Partnership

COB planning requires the active collaboration, communication, and coordination of public officials, private sector, and academia/extension experts. Prior to an outbreak, these groups work together to develop the processes by which non-infected premises can move non-infected animals or uncontaminated animal products. Collaboratively, proactive risk assessments are used to develop the requirements for movement of commodities out of a regulatory Control Area. These requirements can include biosecurity measures, cleaning and disinfection procedures, and surveillance sampling prior to movement. With the backing of regulators, the support of the private sector, and the expertise of academia, the development of COB plans is a critical activity in effective FAD preparedness and response.

## 6.3 Challenges in Continuity of Business Planning

There are a number of challenges that may be faced in developing and executing COB plans in addition to addressing competing priorities for resources in the response effort. Table 1 highlights some of the other challenges which may arise during COB plan preparation and implementation.

**Table 1. Potential Challenges in Continuity of Business Planning**

<p><i>Sector diversity:</i> <b>Even within sectors of animal industry, production practices are very diverse, and it may be difficult to acquire consensus on specific criteria for movement.</b> It is important to recognize the different needs and priorities of all those involved in COB planning for a successful plan.</p>
<p><i>Keeping the momentum going:</i> The individuals involved in COB planning are typically very busy, with many other commitments. It can be difficult to consistently meet and discuss planning developments. In many cases, clearly identified leaders, transparent objectives for different members, good communication, and clear value for all parties can help keep the planning process going.</p>
<p><i>Delegating tasks:</i> To overcome the tactical and strategic challenges in developing a COB plan, it is crucial that those involved have clearly assigned responsibilities to the group and are accountable to deadlines; whether doing risk assessments or the actual writing of the plans, delegating and covering responsibilities outside of COB planning meetings enables systematic collaboration and input from subject matter experts during group discussion.</p>
<p><i>Lack of resources:</i> This can be a problem for developing, communicating, as well as exercising COB plans. Effective use of resources and buy-in from diverse stakeholder groups within the industry can help to ensure COB planning continues, and that resources and personnel are available for development and communication.</p>

## 7. CONTINUITY OF BUSINESS: THE BIGGER PICTURE

As presented in Box 1, COB is the managed movement of non-infected animals and non-contaminated animal products in an FAD outbreak. COB planning helps to reduce losses, facilitate food security, and allow agriculture and food industries to continue business operations by minimizing the impacts of quarantines on non-infected premises within regulatory Control Areas.

Specifically, COB planning helps to protect

- animal health, by preventing the transmission of an FAD from an infected to a naïve animal subpopulation;
- food security, by ensuring movement of unaffected animals and animal products; and
- public health, by mitigating zoonotic threats in animal populations and the food supply.

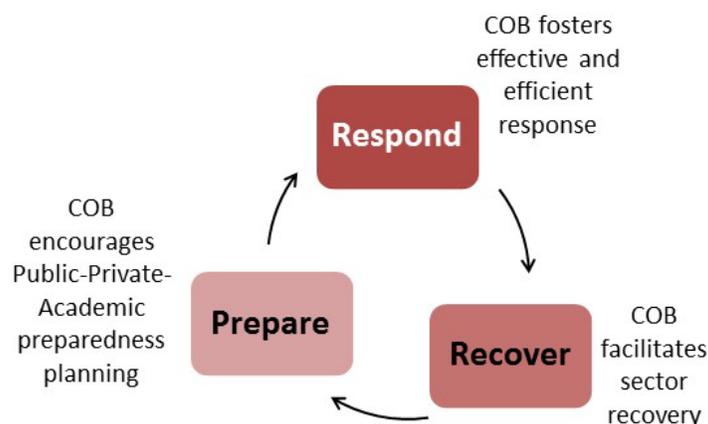
COB also provides a number of tangible benefits, as follows:

- Continued supply of animal and animal products.
- Reduced production disruption and lessened negative economic impacts on rural communities.
- Sustained food safety and security in the event of an FAD outbreak.
- Increased biosecurity protects animal health by excluding pathogens from healthy populations.
- Improved understanding of the needs of industry, regulators, and consumers when dealing with an FAD response.

In addition to these benefits, COB fits into the emergency management framework of preparing, responding, recovering, and mitigating animal health threats. In particular, COB work does the following (illustrated in Figure 4):

- *Prepare:* COB discussions and awareness help to prepare for FAD outbreaks by bringing together public, private, and academic collaborators who may notice other gaps in response planning while walking through the detailed scenarios of COB planning.
- *Respond:* COB planning helps in response to an outbreak by providing specific, science- and risk-based requirements and instructions for the movement of animals and animal products.
- *Recover:* COB plans also help recovery from an FAD outbreak by facilitating sector recovery through the managed movement of animals and animal products from non-infected premises.

**Figure 5. Continuity of Business Planning in Emergency Management**



COB planning for managed movement of animals and animal products from non-infected premises is a discrete part of larger all-hazards preparedness and continuity of operations planning, specifically for an FAD incident. For more information on the broader environment of business preparedness and continuity planning in the emergency management community, please refer to the following links:

- Federal Emergency Management Agency (FEMA), [www.ready.gov](http://www.ready.gov)
- FEMA Business Recovery, <https://www.ready.gov/business>.

## **8. CONTINUITY OF BUSINESS PLANNING EFFORTS (SECURE FOOD SUPPLY PROJECTS)**

Currently, there are a number of successful efforts underway where the government, private sector, and academia are collaborating to improve COB planning. These Secure Food Supply projects are developing commodity specific COB plans. Support for these plans is critical for their successful continuation. The goals of the Secure Food Supply projects, summarized in Table 2, are to do the following in an FAD outbreak:

- Avoid interruptions in animals and animal product movement to commercial processing from premises with no evidence of FAD infection;
- Provide a continuous supply of wholesome food to consumers; and
- Maintain business continuity for producers, transporters, and food processors through response planning.

Current public-private-academic collaborations and Secure Food Supply projects include the following:

- Secure Poultry Supply Plan: <http://www.securepoultrysupply.com>
  - Secure Egg Supply (SES) Plan: <http://secureeggssupply.com/>
  - Secure Broiler Supply (SBS): <http://www.securebroilersupply.com>
  - Secure Turkey Supply (STS): <http://www.secureturkeysupply.com/>
- Secure Milk Supply (SMS) Plan: <http://www.securemilksupply.org/>
  - National Working Groups:
    - Biosecurity
    - Movement Plans
    - Risk Assessment.
  - State/Regional SMS Projects: <http://securemilksupply.org/state-regional.php>
    - Colorado SMS
    - California SMS

- Mid-Atlantic SMS (Delaware, Maryland, North Carolina, New Jersey, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia)
- New England SMS (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)
- Oregon, Washington SMS
- Wisconsin SMS.
- Secure Pork Supply (SPS): <http://securepork.org/>.

Key academic contributors to COB projects include the

- Center for Food Security and Public Health (CFSPH), Iowa State University;
- Center for Animal Health and Food Safety (CAHFS), University of Minnesota;
- University of California, Davis, Department of Veterinary Medicine and Epidemiology; and
- Institute for Infectious Animal Diseases (IIAD), Texas A&M University (formerly the FAZD Center).

**Table 2. Summary of Secure Food Supply Projects**

Commodity Plan (targeted FAD)		Members (in alphabetical order)	Progress	More Information
Secure Poultry Supply (HPAI)	Secure Egg Supply	<ul style="list-style-type: none"> <li>• Association of Veterinarians in Egg Production</li> <li>• Egg sector veterinarians and officials</li> <li>• IIAD</li> <li>• Iowa State University (CFSPH)</li> <li>• SAHOs</li> <li>• United Egg Producers</li> <li>• University of Minnesota (CAHFS)</li> <li>• USDA, APHIS VS</li> </ul>	<p>The following have been created:</p> <ul style="list-style-type: none"> <li>• proactive risk assessments,</li> <li>• permit guidance and sample permits,</li> <li>• surveillance guidelines,</li> <li>• cleaning and disinfection guidelines,</li> <li>• epidemiological questionnaire,</li> <li>• biosecurity checklist,</li> <li>• website to facilitate data collection, and</li> <li>• informational videos.</li> </ul> <p>At this time, the focus is on simplifying existing guidance and creating a unified Secure Poultry Supply Plan with harmonized recommendations across different industries.</p>	<ul style="list-style-type: none"> <li>• The SES website: <a href="http://www.secureeggssupply.com">www.secureeggssupply.com</a></li> </ul>
	Secure Broiler Supply	<ul style="list-style-type: none"> <li>• Association of Veterinarians in Broiler Production</li> <li>• Industry</li> <li>• SAHOs</li> <li>• University of Minnesota</li> <li>• USDA-APHIS VS</li> </ul>		<ul style="list-style-type: none"> <li>• The SBS website: <a href="http://www.securebroilersupply.com">www.securebroilersupply.com</a></li> </ul>
	Secure Turkey Supply	<ul style="list-style-type: none"> <li>• Association of Veterinarians in Turkey Production</li> <li>• Industry</li> <li>• Iowa State University (CFSPH)</li> <li>• National Turkey Federation</li> <li>• SAHOs</li> <li>• University of Minnesota (CAHFS)</li> <li>• USDA, APHIS VS</li> </ul>		<ul style="list-style-type: none"> <li>• The STS website: <a href="http://www.secureturkeysupply.com">www.secureturkeysupply.com</a></li> </ul>
Secure Milk Supply (FMD)	National	<ul style="list-style-type: none"> <li>• IIAD</li> <li>• Industry</li> <li>• Iowa State University (CFSPH)</li> <li>• SAHOs</li> <li>• University of California, Davis</li> <li>• University of Minnesota (CAHFS)</li> <li>• USDA, APHIS VS</li> </ul>	<ul style="list-style-type: none"> <li>• National working groups                             <ul style="list-style-type: none"> <li>– Biosecurity</li> <li>– Movement plans</li> <li>– Risk assessment</li> </ul> </li> <li>• Proactive risk assessments</li> <li>• Biosecurity performance standards</li> <li>• Development of tools to facilitate movement and permitting decisions</li> <li>• Materials to support milk movement</li> </ul>	<ul style="list-style-type: none"> <li>• The SMS website: <a href="http://www.securemilksupply.org">www.securemilksupply.org</a></li> </ul>
	Regional	<ul style="list-style-type: none"> <li>• California</li> <li>• Colorado</li> <li>• Mid Atlantic—DE, MD, NC, NJ, PA, SC, TN, VA, WV</li> <li>• New England—CT, MA, ME, NH, RI, VT</li> <li>• Oregon, Washington</li> <li>• Wisconsin</li> </ul>		<ul style="list-style-type: none"> <li>• This page contains contact information to each regional SMS Group: <a href="http://securemilksupply.org/state-regional.php">http://securemilksupply.org/state-regional.php</a></li> </ul>
Secure Pork Supply (FMD, CSF, ASF, and swine vesicular disease)		<ul style="list-style-type: none"> <li>• American Association of Swine Veterinarians</li> <li>• IIAD</li> <li>• Industry</li> <li>• Iowa State University (CFSPH)</li> <li>• National Pork Board</li> <li>• National Pork Producers Council</li> <li>• SAHOs</li> <li>• University of Minnesota (CAHFS)</li> <li>• USDA, APHIS VS</li> </ul>	<ul style="list-style-type: none"> <li>• Proactive risk assessments</li> <li>• Biosecurity performance standards, guidelines, and illustrations</li> <li>• Active observational surveillance information</li> <li>• Factors to consider in implementing controlled movement of swine</li> </ul>	<ul style="list-style-type: none"> <li>• The SPS website: <a href="http://www.securepork.org">www.securepork.org</a></li> </ul>

Note: ASF = African swine fever, CSF = classical swine fever.

Secure Food Supply documents, plans, and other guidance information are considered as “DRAFTS,” materials are updated as required/appropriate, guidance may evolve in an outbreak situation.

## Glossary

### **Continuity of Business**

The managed movement of non-infected animals and non-contaminated animal products in an FAD outbreak to facilitate agriculture and food industries in maintaining normal business operations while also mitigating the risk of disease spread.

### **Movement Control**

Activities used to control the movement of animals, animal products, and fomites in an area subject to certain criteria.

### **Permitting**

System that approves and documents necessary movements into, within, and out of a regulatory Control Area without creating an unacceptable risk of disease spread.

### **Quarantine**

Imposed restrictions on entering or leaving a premises, area, or region where disease exists or is suspected.

## Abbreviations

**AHPA**

Animal Health Protection Act

**APHIS**

Animal and Plant Health Inspection Service

**ASF**

African swine fever

**CAHFS**

Center for Animal Health and Food Safety  
(University of Minnesota)

**CFR**

Code of Federal Regulations

**CFSPH**

Center for Food Security and Public Health  
(Iowa State University)

**COB**

continuity of business

**CSF**

classical swine fever

**EMRS2**

Emergency Management Response System 2.0

**FAD PReP**

Foreign Animal Disease Preparedness and  
Response Plan

**FAD**

foreign animal disease

**FEMA**

Federal Emergency Management Agency

**FMD**

foot-and-mouth disease

**HPAI**

highly pathogenic avian influenza

**IIAD**

Institute for Infectious Animal Diseases

**IMT**

Incident Management Team

**IP**

Infected Premises

**NAHEMS**

National Animal Health Emergency  
Management System

**NLRAD**

National List of Reportable Animal Diseases

**QMC**

quarantine and movement control

**SAHO**

State Animal Health Official

**SBS**

Secure Broiler Supply

**SES**

Secure Egg Supply

**SMS**

Secure Milk Supply

**SPS**

Secure Pork Supply

**STS**

Secure Turkey Supply

**TDD**

telecommunications device for the deaf

**U.S.C.**

United States Code

**USDA**

United States Department of Agriculture

**VS**

Veterinary Services

## APPENDIX A: THE IMPERATIVE FOR FOREIGN ANIMAL DISEASE PREPAREDNESS AND RESPONSE

### Why Foreign Animal Diseases Matter

Preparing for and responding to foreign animal diseases (FADs)—such as highly pathogenic avian influenza (HPAI) and foot-and-mouth disease (FMD)—are critical actions to safeguard the nation’s animal health, food system, public health, environment, and economy. FAD PRoP, or the *Foreign Animal Disease Preparedness and Response Plan*, prepares for such events and provides guidance for activities during a response.

The 2014–2015 HPAI outbreak in the United States cost \$850 million, just for indemnity payments and response activities on premises. Studies have estimated a likely national welfare loss between \$2.3–69 billion<sup>1</sup> for an FMD outbreak in California, depending on delay in diagnosing the disease.<sup>2</sup> The economic impact of an FAD outbreak results from lost international trade and disrupted interstate trade, as well as from costs directly associated with the eradication effort, such as depopulation, indemnity, disposal, and virus elimination. In addition, there are direct and indirect costs related to foregone production, unemployment, and losses in related businesses. The social and psychological impact on owners and growers can be significant. Diseases with zoonotic potential, such as HPAI and Nipah/Hendra, may also pose a threat to public health.



### Challenges of Responding to an FAD Event

Responding to an FAD event—large or small—is complex and difficult, challenging all stakeholders involved. Response activities require significant prior preparation. There are imminent and problematic disruptions to interstate commerce and international trade.

A response effort must have the capability to be rapidly scaled up or down according to the needs of the specific incident. This involves many personnel, resources, and possibly veterinary countermeasures. Not all emergency responders have specific food and agriculture skills required in areas such as biosecurity, QMC, epidemiological investigation, diagnostic testing, depopulation, disposal, and possibly emergency vaccination.

Establishing widely communicated and understood response goals and guidelines, as accomplished by the FAD PRoP materials, helps to broaden awareness of common objectives as well as potential problems.

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<sup>1</sup> Carpenter T.E., O'Brien J.M., Hagerman A.D., & McCarl B.A. 2011. "Epidemic and economic impacts of delayed detection of foot-and-mouth disease: a case study of a simulated outbreak in California. *J Vet Diagn Invest.* 23:26–33.

<sup>2</sup> Estimates based on models may vary: Ekboir (1999) estimated a loss of between \$8.5 and \$13.5 billion for an FMD outbreak in California. Ekboir J.M. 1999. "Potential Impact of Foot-and-Mouth Disease in California: the Role and Contribution of Animal Health Surveillance and Monitoring Services." *Agricultural Issues Center.* University of California, Davis.

## Lessons Learned from Past FAD Outbreaks

The foundation of FAD PReP is the lessons learned from past FAD incidents. FAD PReP is based on the following:

- Providing processes for emergency planning that respect local knowledge.
- Integrating State-Federal-Tribal-industry planning processes.
- Ensuring that there are clearly defined, obtainable, and unified goals for response.
- Having a Unified Incident Command with a proper delegation of authority that is able to act with speed and certainty.
- Employing science- and risk-based management approaches to FAD response.
- Ensuring that all guidelines, strategies, and procedures are communicated effectively to responders and stakeholders.
- Identifying trained personnel and resources that are required for an effective incident response.
- Working to resolve competing interests prior to an outbreak and addressing them quickly during an outbreak.
- Achieving rapid FAD detection and tracing.

## FAD PReP Mission and Goals

The mission of FAD PReP is to raise awareness, expectations, and develop capabilities surrounding FAD preparedness and response. The goal of FAD PReP is to integrate, synchronize, and deconflict preparedness and response capabilities as much as possible before an outbreak by providing goals, guidelines, strategies, and procedures that are clear, comprehensive, easily readable, easily updated, and that comply with the National Incident Management System.

In the event of an FAD outbreak, the three key response goals are to: (1) *detect, control, and contain the FAD in animals as quickly as possible*; (2) *eradicate the FAD using strategies that seek to stabilize animal agriculture, the food supply, the economy, and to protect public health and the environment*; and (3) *provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products*. Achieving these three goals will allow individual livestock facilities, States, Tribes, regions, and industries to resume normal production as quickly as possible. They will also allow the United States to regain FAD-free status without the response effort causing more disruption and damage than the disease outbreak itself.

## FAD PReP Documents and Materials

FAD PReP is not just one, standalone FAD plan. Instead, it is a comprehensive U.S. preparedness and response strategy for FAD threats, both zoonotic and non-zoonotic. This section provides examples of the different types of FAD PReP documents available.

- Strategic Plans—Concept of Operations
  - *Animal and Plant Health Inspection Service (APHIS) Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0): This document provides an overall concept of operations for FAD preparedness and response for APHIS, explaining the framework of existing approaches, systems, and relationships.
  - *APHIS Foreign Animal Disease Framework: Response Strategies* (FAD PReP Manual 2-0): This document provides significant detail on response strategies that will be conducted in an FAD outbreak.
  - *Incident Coordination Group Plan* (FAD PReP Manual 3-0): This document explains how APHIS headquarters will organize in the event of an animal health emergency.
  - *FAD Investigation Manual* (FAD PReP Manual 4-0): This field-ready manual provides detailed information on completing an FAD investigation from start to finish.

- *A Partial List of FAD Stakeholders* (FAD PReP Manual 5-0): This guide identifies key stakeholders with whom the National Preparedness and Incident Coordination (NPIC) Center collaborates.
- National Animal Health Emergency Management System Guidelines
  - These documents describe many of the critical preparedness and response activities, and can be considered as a competent veterinary authority for responders, planners, and policy-makers.
- Industry Manuals
  - These manuals describe the complexity of industry to emergency planners and responders and provide industry a window into emergency response.
- Disease Response Plans
  - Response plans are intended to provide disease-specific information about response strategies. They offer guidance to all stakeholders on capabilities and critical activities that would be required to respond to an FAD outbreak.
- Standard Operating Procedures (SOPs) for Critical Activities
  - For planners and responders, these SOPs provide details for conducting critical activities such as disposal, depopulation, cleaning and disinfection, and biosecurity that are essential to effective preparedness and response to an FAD outbreak. These SOPs provide operational details that are not discussed in depth in strategy documents or disease-specific response plans.
- Continuity of Business Plans (commodity specific plans developed by public-private-academic partnerships)
  - Known as the Secure Food Supply Plans, these materials use science- and risk-based information to facilitate market continuity for specific products in an outbreak.
- APHIS Emergency Management
  - APHIS Directives and Veterinary Services Memorandums provide important emergency management policy. These documents provide guidance on topics ranging from emergency mobilization, to FAD investigations, to protecting personnel from HPAI.

These documents are available publicly at <http://www.aphis.usda.gov/fadprep>.

## **APPENDIX B: FOOT-AND-MOUTH DISEASE RESPONSE QUARANTINE, MOVEMENT CONTROL, AND CONTINUITY OF BUSINESS READY REFERENCE**

This appendix contains the Foot-and-Mouth Disease Response Ready Reference Guide for Quarantine, Movement Control, and Continuity of Business. It is available at: <http://www.aphis.usda.gov/fadprep>.

In an FMD outbreak, quarantine, movement control, and continuity of business (managed movement) help to achieve the goals of an FMD response. In particular, these critical activities work to control and contain FMD, striving to eradicate the virus while providing science- and risk-based approaches to facilitate the movement of non-infected animals and non-contaminated animal products to stabilize animal agriculture, the food supply, the economy, and protect public health.

### Quarantine and Movement Control in an FMD Outbreak

In an FMD outbreak, quarantine and movement control are critical activities for an effective FMD response effort. By restricting the movement of infected animals, animal products, and contaminated fomites, quarantine and movement control play a significant role in stopping the spread of FMD. Quarantines will be implemented for Infected, Suspect, and Contact Premises. Movement controls will be implemented for At-Risk and Monitored Premises within a Control Area (CA).

### Continuity of Business (Managed Movement) in an FMD Outbreak

This helps to facilitate agriculture and food industries in maintaining business operations, while also mitigating the risk of disease spread. Continuity of business planning can

- ◆ protect animal health by preventing the transmission of FMD from an infected to a naïve animal subpopulation,
- ◆ protect food security by facilitating the movement of food products to processing, and
- ◆ help to mitigate the impact of quarantines on non-infected premises in regulatory CAs.

### How Does Continuity of Business Work with Quarantine and Movement Control?

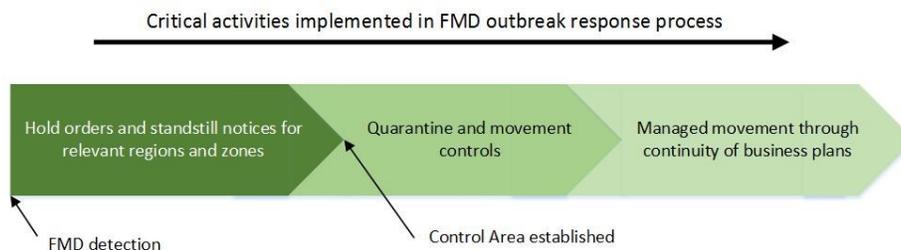
Quarantine, movement control, and continuity of business have the same ultimate goal: to prevent the transmission of FMD to non-infected premises, particularly those outside the CA. While quarantine and movement restrictions are highly effective at limiting the spread of disease, they also impede typical business operations—this is when continuity of business plans enter into response efforts to effectively manage movement.

- ◆ **Quarantines and movement controls** are applied to premises in a regulatory CA to ensure infected animals and contaminated fomites and products do not leave premises. Quarantines are applied to Infected, Contact, and Suspect Premises. Movement controls are applied to At-Risk and Monitored Premises. Consideration will be given to critical movements (i.e., feed trucks).
- ◆ **Continuity of business or managed movement** is intended to manage movement for non-infected premises (At-Risk and Monitored Premises).

### Implementation of Quarantine, Movement Control, and Continuity of Business in an FMD Outbreak

Immediately after FMD detection, a regulatory CA, comprised of an Infected and Buffer Zone, will be designated. Quarantines will be implemented for Infected, Contact, and Suspect Premises in this regulatory CA. Continuity of business plans—ideally developed in advance—will be implemented to facilitate the managed movement of commodities and animals from At-Risk and Monitored Premises existing within this regulatory CA, helping these industries continue business operations. At all times, consideration will be given to critical movements, like feed trucks.

In an FMD outbreak, a Unified Command would be established to manage the incident. The animal health emergency response plan of every State and Tribal Nation should describe the implementation of quarantine and movement controls, including a permit system. USDA may also impose a Federal quarantine for the management of interstate commerce from infected States.



**In an FMD outbreak, there will be competing priorities for resources in order to conduct the critical activities required to control, contain, and eradicate FMD. Planning is vitally important to ensure that limited resources are used effectively and efficiently.**

### FMD-Specific Challenges

The FMD virus is highly contagious and can spread easily through fomite movement. In addition, an outbreak of FMD would have significant economic implications in terms of interstate trade and international commerce. The capabilities required to respond to an FMD outbreak are extensive. Any response effort, whether the outbreak is large or small, will require significant operational capabilities.

### Critical Activities and Tools

In addition to quarantine and movement control and continuity of business, other critical activities will be implemented in an FMD outbreak to contain, control, and eradicate the virus. These include

- ◆ a public awareness campaign,
- ◆ epidemiological investigation and tracing,
- ◆ rapid diagnosis and reporting,
- ◆ increased surveillance,
- ◆ biosecurity measures,
- ◆ cleaning and disinfection,
- ◆ appropriate disposal procedures,
- ◆ mass depopulation and euthanasia (as response strategy indicates), and
- ◆ emergency vaccination (as response strategy indicates).

## Continuity of Business Is a Public, Private, Academic Partnership

Continuity of business planning requires the active collaboration, communication, and coordination of public officials, private industry, and academia/extension experts. Prior to an outbreak, these groups work together to develop the processes by which non-infected premises can move non-infected animals and non-contaminated animal products. Collaboratively, proactive risk assessments will be used to develop the requirements for movement of commodities out of a regulatory CA. These requirements can include biosecurity measures, cleaning and disinfection procedures, and surveillance sampling prior to movement. With the backing of regulators, the support of industry, and the expertise of academia, the development of continuity of business plans is a critical activity in effective FMD preparedness and response.

## Preparedness and Response Goals for Continuity of Business

- ◆ Provide science- and risk-based approaches and systems for the continuity of business involving non-infected animals and non-contaminated animal products.
- ◆ Establish a transparent and effective system for risk assessments, surveillance requirements, biosecurity procedures, and a permit process in order to promote stakeholder acceptance and compliance with regulatory interventions by State, Federal, and Tribal authorities.
- ◆ Work with industry and Incident Command to facilitate and permit movement of non-infected animals and non-infected animal products throughout the outbreak. Enter permits and movements in EMRS 2.0 in a timely fashion (at least 24-hour intervals).
- ◆ Perform proactive risk analysis or risk assessments for the movement of animals and/or animal commodities that are potentially disrupted or affected by a disease response.
- ◆ Establish capabilities to prove disease-freedom and flock or herd health production parameters for interstate trade.
- ◆ Implement continuity of business plans (the Secure Food Supply Plans) when a CA is established.

## What Are the Current Continuity of Business Planning Initiatives for FMD?

There are a number of successful efforts underway where the government, private sector, and academia are collaborating to improve continuity of business planning for an FMD outbreak. Current planning initiatives include the:



**Secure Milk Supply:** In progress. Goal of planning is to avoid and mitigate interruptions in raw milk movement from dairy farms to processing during an FMD outbreak.

**Secure Pork Supply:** In progress. Goal of planning is to avoid and mitigate interruptions in the movement of pork and pork products during an FMD, classical swine fever, African swine fever, or swine vesicular disease outbreak.

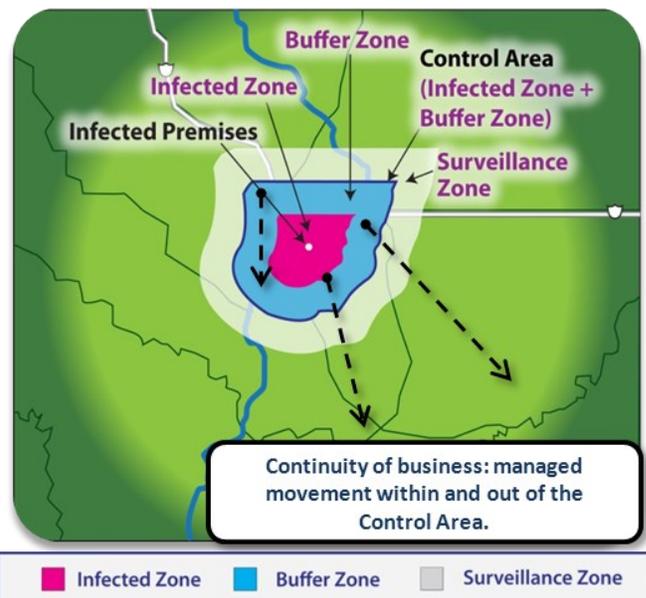
**Secure Beef Supply:** In progress. Goal of planning is to avoid and mitigate interruptions in the movement of beef and beef products during an FMD outbreak.

Please see the Overview of the Secure Food Supply Plans Ready Reference Guide for more information on these and other projects.

### What Are Key Elements of Continuity of Business Plans for Managed Movement?

Continuity of business plans will vary, depending on the industry and specific commodity of interest. However, a number of common elements will appear, some of which are listed here:

- ◆ **Risk assessments:** Proactive risk assessments can help determine the disease transmission risk of specific product movements.
- ◆ **Surveillance requirements:** How frequently samples will be collected, from what populations, and for how long.
- ◆ **Biosecurity guidelines:** Appropriate precautions, personal protective equipment, and specific steps for various fomites and equipment.
- ◆ **Cleaning and disinfection procedures:** Cleaning requirements for various fomites and equipment, including information on appropriate disinfectants.
- ◆ **Epidemiological information:** Information on routine and non-routine movements to and from premises, as well as information on the number of animals, species, and age of animals.
- ◆ **Permitting guidance:** Transparent, explicit guidance for Incident Command regarding movement requirements for various commodities.

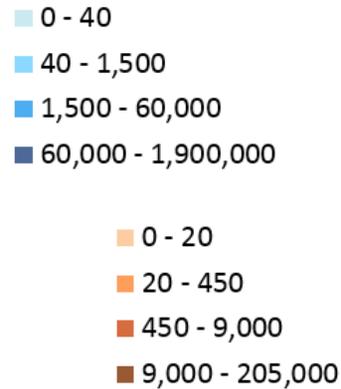
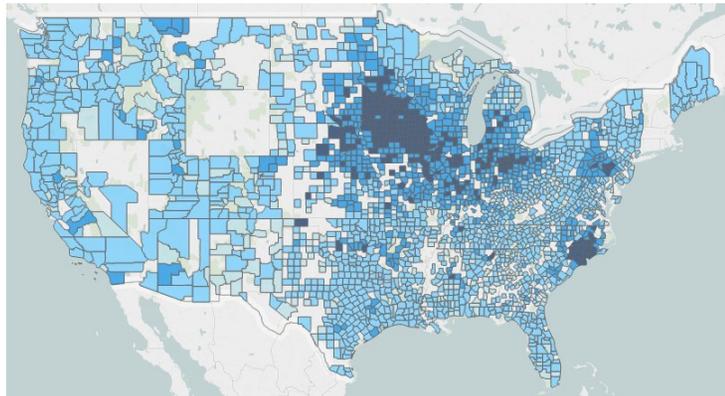




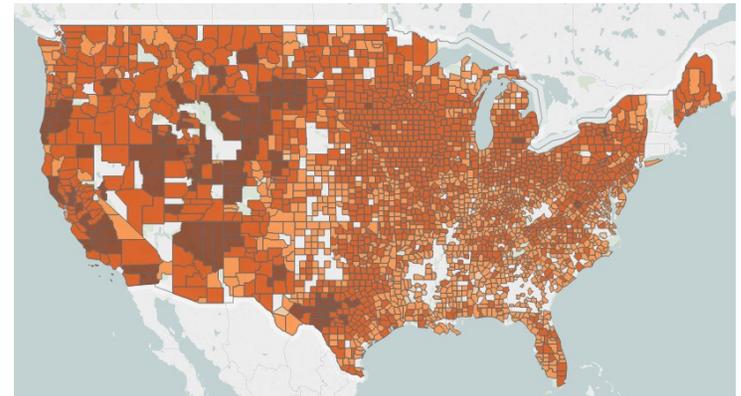
Overview

The previous page highlights the importance of quarantine and movement control measures and continuity of business (managed movement) plans in the event of an FMD outbreak to contain, control, and eradicate FMD while stabilizing animal agriculture, the food supply, the economy, and protecting public health. The maps on this page provide a common picture of livestock densities and distributions to understand the potential impact of quarantines, movement controls, and understand the imperative for continuity of business planning. The degree of interstate commerce and international trade in the United States (continued on the next page) means that an FMD outbreak would have a significant economic impact as movement of animals (and products) slows dramatically or even halts, particularly in the beginning of an outbreak.

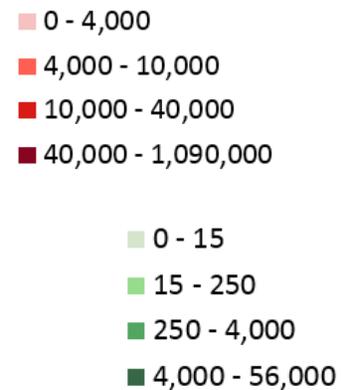
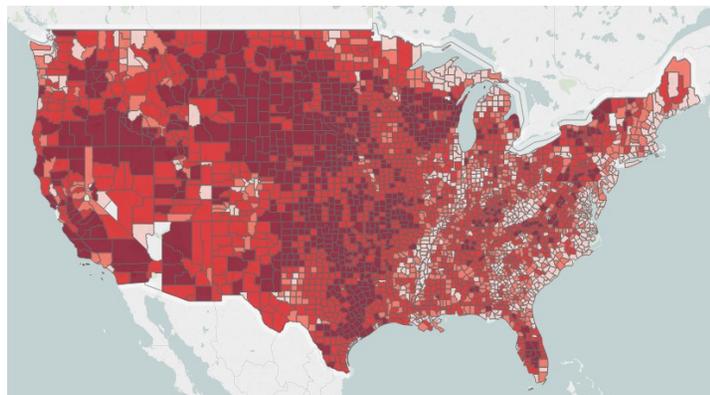
Swine Population by County



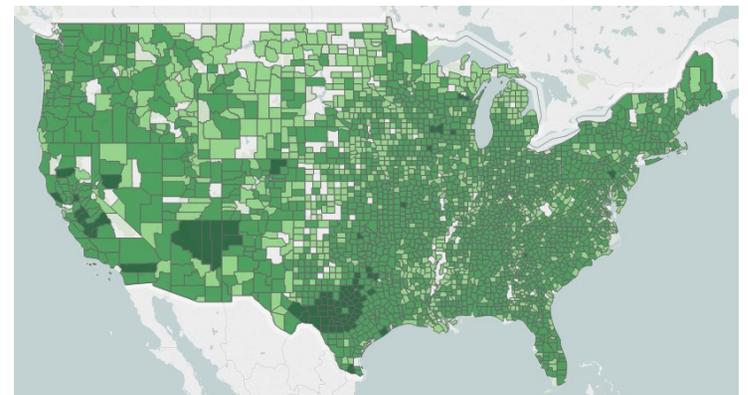
Sheep Population by County



Bovine Population by County



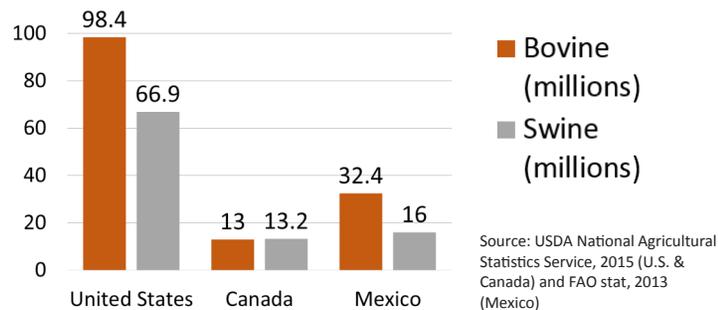
Goat Population by County



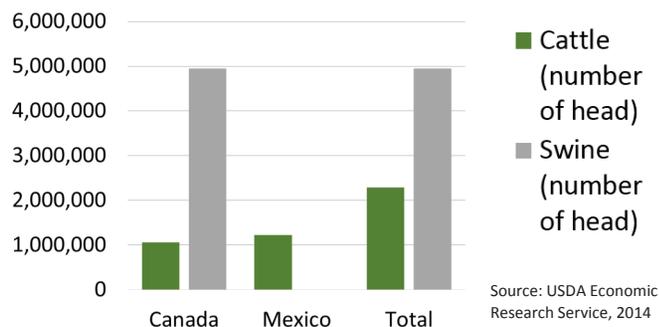
Data may be incomplete. Best available data incorporated.

Source: National Agricultural Statistics Service, 2012

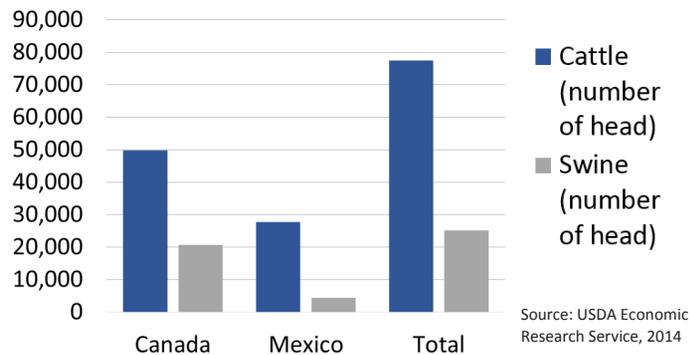
**Swine and Bovine Inventory—North America**



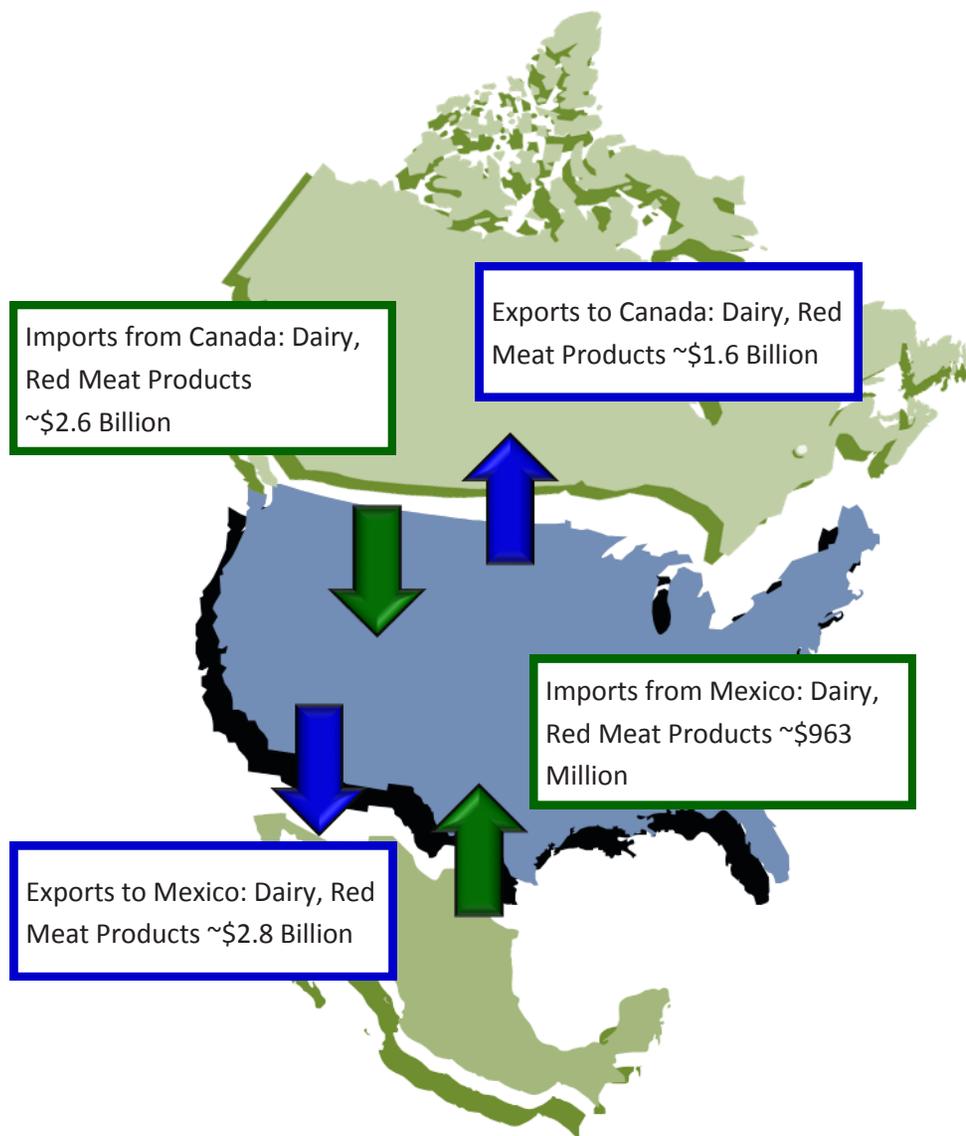
**U.S. Imports from Mexico and Canada (Live Animals)**



**U.S. Exports to Mexico and Canada (Live Animals)**



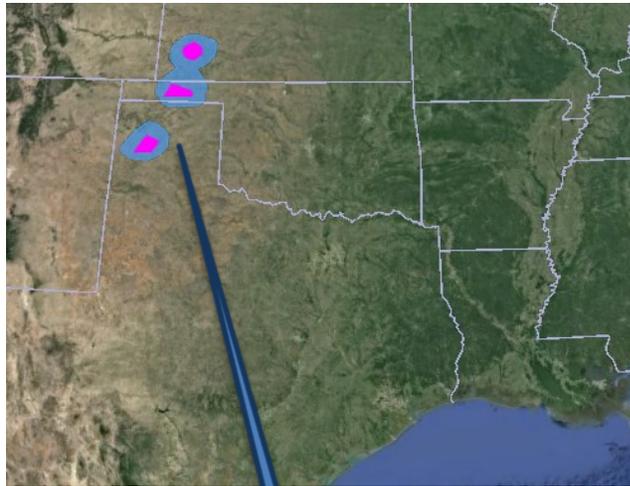
**U.S. Product Imports and Exports to Canada and Mexico (Value)**



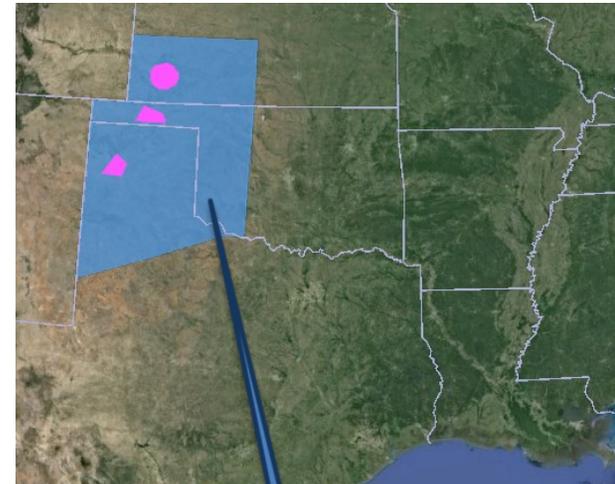
Source: USDA Foreign Agricultural Service, 2014

**Control Areas in an FMD Outbreak (Small and Medium)**

There are many different factors that will be considered in determining the size of a Control Area. Smaller Control Areas may mean that fewer premises and animals are affected by quarantines and movement controls, however, if premises or animals are infected but undetected, there is a higher chance they may exist outside the Control Area (increasing the risk of disease spread).



**Small Control Areas**  
**Affected:**  
~4.6 million livestock  
~4,500 operations



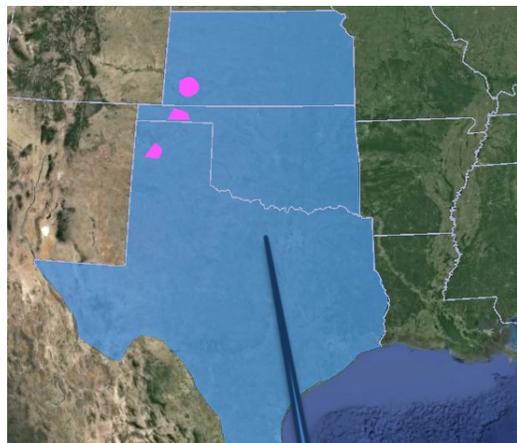
**Medium Control Areas**  
**Affected:**  
~10 million livestock  
~27,000 operations

Data source: National Agricultural Statistics Service, 2012.



**Control Areas in an FMD Outbreak (Large)**

There are many different factors that will be considered in determining the size of a Control Area. Large Control Areas may mean that many more premises and animals are affected by quarantines and movement controls, however, if premises or animals are infected but undetected, it is likely that they may exist within the Control Area rather than outside of it, limiting the spread of disease.



**Large Control Areas**

**Affected:**  
~28 million livestock  
~283,000 operations

Data source: National Agricultural Statistics Service, 2012

**Minimum Sizes of Zones and Areas**

Zone or Area	Minimum Size and Details
Infected Zone (IZ)	Perimeter should be at least 3 km (~1.86 miles) beyond perimeters of presumptive or confirmed Infected Premises. Will depend on disease agent and epidemiological circumstances. This zone may be redefined as the outbreak continues.
Buffer Zone (BZ)	Perimeter should be at least 7 km (~4.35 miles) beyond the perimeter of the Infected Zone. Width is generally not less than the minimum radius of the associated Infected Zone, but may be much larger. This zone may be redefined as the outbreak continues.
Control Area (CA)	Perimeter should be at least 10 km (~6.21 miles) beyond the perimeter of the closest Infected Premises. This area may be redefined as the outbreak continues.
Surveillance Zone (SZ)	Width should be at least 10 km (~6.21 miles), but may be much larger.



**Regulatory Control Areas: Examples of the Upsides and Downsides to Large and Small Control Areas**

Small Control Area	Large Control Area
Certainty that all Infected Premises are contained in Control Area is lower.	Certainty that all Infected Premises are contained in Control Area is higher.
Likelihood of disease spread to outside the Control Area may be higher.	Likelihood of disease spread to outside the Control Area may be lower.
Quarantine and movement controls easier to manage, less resources required, less animals and premises to manage.	Quarantine and movement controls harder to manage, more resources required, more premises and animals to manage.
Potentially less impact to normal business.	Potentially more impact to normal business.