NAHEMS GUIDELINES:
CONTINUITY OF BUSINESS

FAD PReP
Foreign Animal Disease Preparedness & Response Plan

USDA

NAHEMS
National Animal Health Emergency Management System

APHIS

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

OCTOBER 2012

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 **October 2012**. Please send questions or comments to:

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PREFACE

The Foreign Animal Disease Preparedness and Response Plan (FAD PReP)/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 activities.

These Continuity of Business Guidelines—a component of the Animal and Plant Health Inspection Service (APHIS) FAD PReP/NAHEMS Guidelines series—is 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 highly contagious 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 emergency.

ADDITIONAL APHIS DOCUMENTS

Several key APHIS documents complement this 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)
- Foot-and-Mouth Disease Response Ready Reference Guide—Quarantine, Movement Control, and Continuity of Business
- FAD PReP/NAHEMS Guidelines:
  - Biosecurity
- FAD PReP Standard Operating Procedures
  - 9. Biosecurity

These documents are available on the FAD PReP collaboration website at: https://fadprep.lmi.org; they are also available on the Inside APHIS site for APHIS employees, http://inside.aphis.usda.gov/vs/em/fadprep.shtml. Key documents are available publicly, http://www.aphis.usda.gov/animal_health/emergency_management/.

Table of Contents

National Animal Health Emergency Management System

Guidelines: Continuity of Business

1. INTRODUCTION

In a foreign animal disease (FAD) outbreak, there are three goals of a response: 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 protect public health; 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 has far-ranging effects on the animal agriculture system; for example, the cessation of international trade will have a very significant impact on the economy. There will be an estimated $10.7 billion in real market losses in the event of a foot-and-mouth disease (FMD) outbreak, just from the loss of trade in pork, beef, and dairy markets.[1]

While we know that it will be essential to use quarantines and movement controls to stop the spread of an FAD, we also know that these quarantines and movement controls are likely to cause significant disruptions in typical business operations and result in the severe restrictions of intrastate and interstate commerce. While the economic impact of severe restrictions on intrastate and interstate commerce of animals and animal products is harder to quantify, the current agricultural production and marketing systems for swine, dairy, and beef rely on frequent interstate movement. For example, just-in-time production in the swine industry and constant movement of milk in the dairy industry means that there would be extreme interruptions in these systems, resulting in severe economic consequences.

The subject of this Animal and Plant Health Inspection Service (APHIS) Foreign Animal Disease Preparedness and Response Plan (FAD PReP)/National Animal Health Emergency Management System (NAHEMS) Guidelines document is COB, which seeks to alleviate these economic consequences by providing science- and risk-based approaches to manage the movement of non-infected animals and non-contaminated animal products to stabilize animal agriculture, the food supply, and the economy. COB plans and procedures focus on managing movement to ease the effects of quarantine and movement control (QMC), while facilitating disease control and containment. Box 1 helps to explain COB, or managed movement. COB is

[1] Statistics from U.S. Census Bureau, 2010.

one of the veterinary activities, tools, or countermeasures identified by APHIS FAD PReP as critical for effective preparedness and response to an FAD outbreak.

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. This helps to facilitate agriculture and food industries in maintaining normal business operations, while simultaneously mitigating the risk of disease spread from this movement.

This document provides general information about COB. Specific guidance on how non-infected animals and non-contaminated animal products can be managed in a disease outbreak—including permitting information for Incident Commanders—is found in product specific documents, collectively known as the Secure Food Supply plans. This NAHEMS Guidelines document presents information on

- 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,
- COB in emergency management, and
- information on the Secure Food Supply plans.

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 a permit process in order 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 segment affected.
  - Work with industry and Incident Command to facilitate movement of non-infected animals and non-contaminated animal products from non-infected premises.

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 consequences of the outbreak, and the impact of the response, in terms of disruptions to interstate commerce and international trade, national security, food security, animal health, the environment, the economy, and regulatory issues.

- *Acceptance*. Acceptance of response policy (social and political) by different communities, 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, 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 such as 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

Key regulatory interventions in an FAD outbreak are quarantines and movement controls. Federal quarantines and movement restrictions will be instituted to control *interstate* and *international* movement of infected animals and contaminated animal products, whereas States may restrict the movement of animals, animal products, equipment, and other items in order to protect their "disease-free" status/perception. 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 created to facilitate interstate and intrastate trade and reopen our international markets.

4. AUTHORITIES

The Code of Laws of the United States of America (U.S.C.) and the Code of Federal Regulations (CFR) are the two authorities that represent 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 the event of an FAD outbreak, United States Department Agriculture (USDA) APHIS operates under the U.S.C. and CFR, though interim regulations can be implemented—in the event of an outbreak—to prevent the spread of disease.

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. 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 or 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.

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 of FAD investigation and specimen submission, including for Foreign Animal Disease Diagnosticians, please see Veterinary Services (VS) Guidance Document 12001.1 (previously APHIS Veterinary Services Memorandum 580.4) and the Foreign Animal Disease Investigation Manual.

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 (see 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 PReP 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

The early response and enforcement of QMC will involve State, Tribal, and local authority and resources. Authority of the State Animal Health Official 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. Issuance of a quarantine on a premises or movement restrictions within a Control Area may be made based on an FAD detection. Since statutory authorities and regulations vary by State, it is important to become familiar with and follow the authorities of your State. State quarantines will be used to control *intrastate* movements of such animals and products.

Generally, State quarantines and hold orders are issued by the relevant State authority when an FAD is detected or suspected. This may include individual herds, flocks, or premises. State authority for quarantine of animals in an outbreak of an FAD varies widely by State, and may rest with different agencies and/or individuals depending on the situation.

5. CONTINUITY OF BUSINESS AS PART OF AN FAD RESPONSE

5.1 Critical Activities

During an FAD response, many different activities will be conducted simultaneously. Box 2 highlights some of the critical activities which Incident Command (IC) will employ 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.

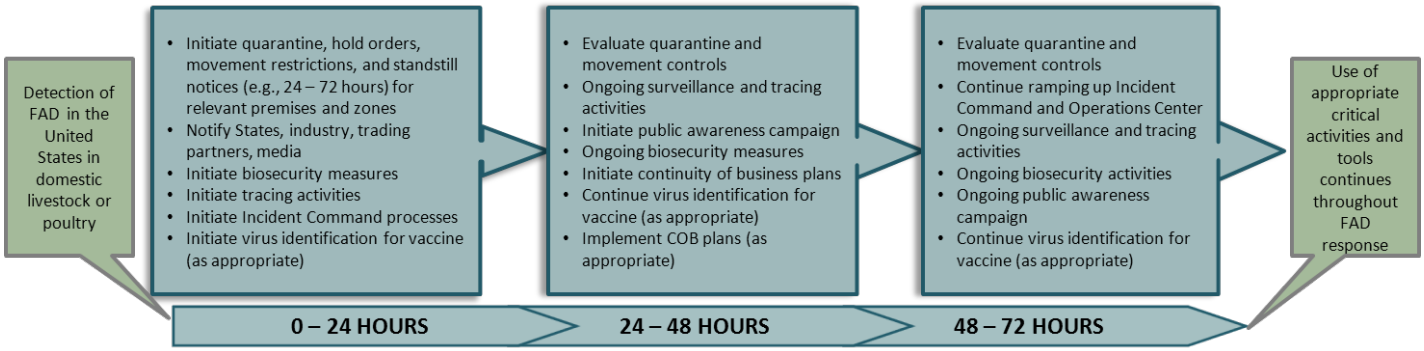
Box 2: Critical Activities and Tools for an FAD Response

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



Note: ICS = Incident Command System.

5.2 Understanding the Difference between COB and QMC

QMC is designed to keep disease agents out of unaffected livestock and poultry populations (e.g., herds, flocks, or other groups of animals) whether the populations are located within or outside a Control Area. QMC directly affects the ability of a farm or food processor to continue key operations in the production and distribution of high-quality food and products during an FAD outbreak.

COB, on the other hand, is the managed movement of non-infected animals and non-contaminated animal products which are in a regulatory Control Area. COB planning 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 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 agriculture and consumers while at the same time achieving the goals of disease response.

Box 3 explains how quarantines, movement controls, 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. Quarantines, movement controls, and COB all help to achieve the goals of an FAD response, providing science- and risk-based approaches to work to control and contain the FAD while stabilizing animal agriculture.

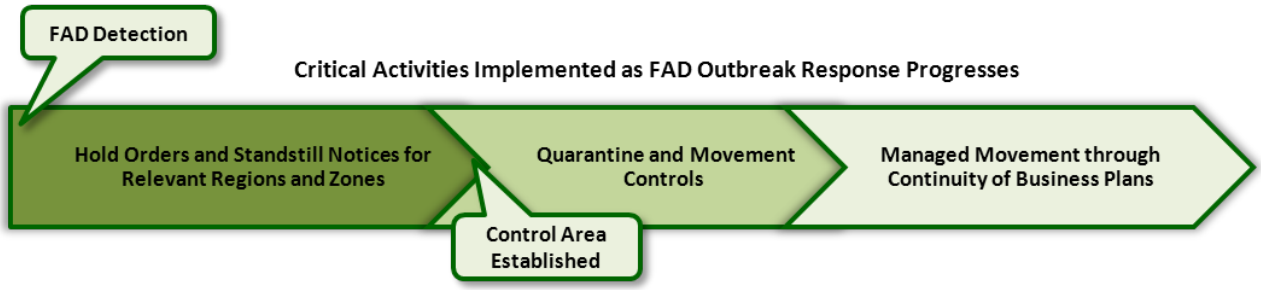
Box 3: Quarantines, Movement Controls, and Continuity of Business (Managed Movement)

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. It is an integrated effort that must be coordinated with other ongoing activities to be successful. 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 competing interests during the response. For example, the regulatory intervention of stringent QMC measures may conflict with the implementation of managed movement plans.

Some competing priorities may be impossible to identify or resolve prior to a specific incident or outbreak. Other competing priorities can be partially resolved or mitigated prior to the incident or outbreak, by elevating the awareness of those competing priorities, identifying the resources needed to accomplish common goals, and establishing mutually accepted and understood response objectives. As each agriculture sector develops 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.

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

6.1 Key Elements

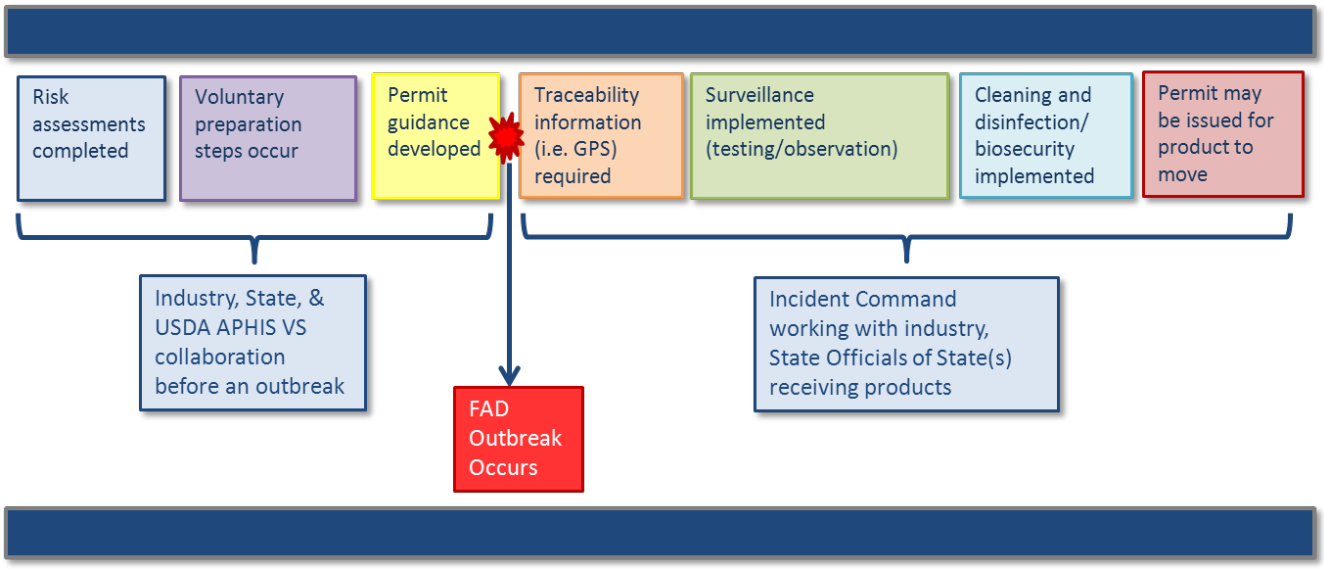
In order to effectively manage movement of non-infected animals and non-contaminated animal products from a regulatory Control Area, there are several common elements which are important in a COB plan or procedure. Please note that every COB plan will be unique, depending on the disease agent, industry,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

- *Risk assessments*: Proactive risk assessments can help determine the transmission risk of product movement, particularly from an infected but undetected premises, herd, or flock.
- *Surveillance requirements*: For example, sampling frequency, population to be sampled, and duration of sampling.
- *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 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 guidance for IC 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.

In order 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, protecting 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 to ensure consumers, producers, responders, and other stakeholders that virus is not being transmitted between premises and that animals and animal products are not a high risk for disease transmission.

Farm managers will be expected to cooperate with the epidemiological investigation. This may include filling out an epidemiological questionnaire to be reviewed by the IC which asks questions to determine whether a premises has been exposed to infected animals, people, or contaminated materials or products. Figure 3 illustrates how COB plans work.

Figure 3. How Continuity of Business Works



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 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 will be 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 COB Planning

There are a number of challenges that may be faced in developing and executing COB plans. One of the challenges—addressing competing priorities for resources in the response effort—has already been discussed. 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

Developing plans or criteria: Some sectors are very diverse, and it may be difficult to get an entire sector to prepare and develop an approach for a COB plan or on specific criteria for movement. It is important to recognize the different needs and priorities of all those involved in COB planning for a successful plan.
Keeping the momentum going: 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, and good communication can help keep the planning process going.
Challenges in planning and execution: There will be many tactical and strategic challenges in developing a COB plan for a particular industry or sector. From risk-assessments to the actual writing of the plans or procedures, there may be difficulties in identifying and analyzing information. As with the other challenges, delegated responsibilities, systematic collaboration, and consistent involvement from subject matter experts are important.
Lack of resources: 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.

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.

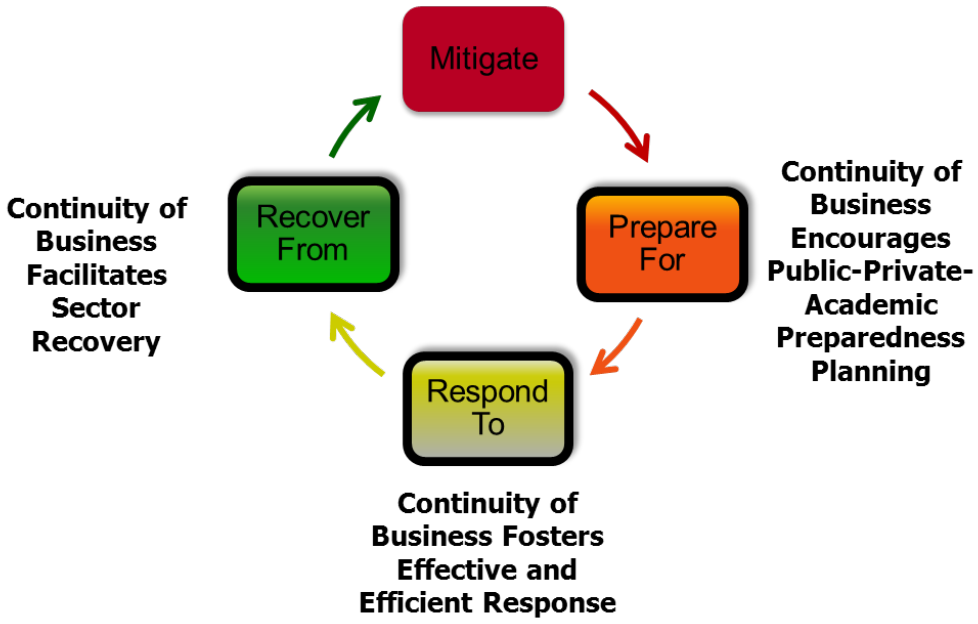
COB also provides a number of tangible benefits, as follows:

- 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 protecting 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 us to prepare for FAD outbreaks by encouraging public-private-academic preparedness planning and collaboration.
- *Respond*: COB planning helps us respond to an outbreak by fostering effective and efficient response mechanisms.
- *Recover*: COB plans also help us recover from an FAD outbreak by facilitating sector recovery through the managed movement of animals and animal products from non-infected premises.

Figure 4. 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
- FEMA Business Recovery, http://www.fema.gov/business/index.shtm
- FEMA Course on Business Crisis and Continuity Management, http://training.fema.gov/EMIWeb/edu/busind.asp.

8. CURRENT COB 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 from this public-

private-academic partnership 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 Egg Supply (SES) Plan: http://secureeggsupply.com/
- Secure Milk Supply (SMS) Plan: http://www.securemilksupply.org/
  - Four National Working Groups:
    - Biosecurity
    - Cleaning and Disinfection
    - Movement Plans
    - Risk Assessment.
  - State/Regional SMS Projects: http://securemilksupply.org/state-regional.php
    - Colorado SMS
    - California SMS
    - New England SMS (CT, MA, ME, NH, RI, VT)
    - Mid-Atlantic SMS (MD, NC, SC, TN, VA)
    - New York, Pennsylvania, and New Jersey SMS
    - Wisconsin SMS.
- Secure Turkey Supply (STS)
- Secure Pork Supply (SPS)
- Broiler Working Group.

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
- National Center for Foreign Animal and Zoonotic Disease Defense, Texas A&M University (FAZD).

Table 2. Summary of Secure Food Supply Projects

Commodity Plan (targeted FAD)		Members (in alphabetical order)	Progress	More Information
Secure Egg Supply (HPAI)		• Egg sector veterinarians and officials • FAZD • Iowa State University (CFSPH) • State Animal Health Officials • United Egg Producers • University of Minnesota (CAHFS) • USDA-APHIS VS	• Proactive risk assessments • Draft permit guidance and sample permits • Draft surveillance guidelines • Cleaning and disinfecting guidelines • Epidemiological questionnaire • Biosecurity checklist • Website to facilitate data collection (Federal and State Transport [FAST] Eggs Website)	• The Secure Egg Supply Website www.secureeggsupply.com
Secure Milk Supply (FMD)	**National**	• FAZD • Industry • Iowa State University (CFSPH) • State Animal Health Officials • University of California, Davis • University of Minnesota (CAHFS) • USDA-APHIS VS	• Four national working groups -Biosecurity -Cleaning and disinfection -Movement plans -Risk assessment • Proactive risk assessments • Draft guidance of biosecurity standards • Development of tools to facilitate movement and permitting decisions	• The Secure Milk Supply Website www.securemilksupply.org
	Regional	• California • Colorado • Mid Atlantic—MD, NC, SC, TN, VA • New England—CT, MA, ME, NH, RI, VT • New York, Pennsylvania, New Jersey • Wisconsin		• This page contains contact information to each regional Secure Milk Supply Group: http://securemilksupply.org/state-regional.php
Broiler Working Group (HPAI)		• Association of Veterinarians in Broiler Production • Industry • State Animal Health Officials • University of Minnesota • USDA-APHIS VS	• Proactive risk assessments • Draft surveillance guidelines	• University of Minnesota, Mindy Buswell, buswe006@umn.edu • University of Minnesota, Tim Goldsmith, gold0188@umn.edu
Secure Turkey Supply (HPAI)		• Association of Veterinarians in Turkey Production • Industry • Iowa State University (CFSPH) • National Turkey Federation • State Animal Health Officials • University of Minnesota (CAHFS) • USDA-APHIS VS	• Proactive risk assessments • Draft STS plan • Draft surveillance guidelines	• Iowa State University Darrell Trampel, dtrampel@iastate.edu • University of Minnesota, Tim Goldsmith, gold0188@umn.edu • University of Minnesota, Tim Snider, snide081@umn.edu

Table 2. Summary of Secure Food Supply Projects, Continued

Commodity Plan (targeted FAD)	Members (in alphabetical order)	Progress	More Information
Secure Pork Supply (FMD, CSF, ASF, and swine vesicular disease)	• American Association of Swine Veterinarians • FAZD • Industry • Iowa State University (CFSPH) • National Pork Board • National Pork Producers Council • State Animal Health Officials • University of Minnesota (CAHFS) • USDA-APHIS VS	• Proactive risk assessments • Working groups established • Draft project plan	• Iowa State University Jim Roth, jaroth@iastate.edu • University of Minnesota, Tim Goldsmith, gold0188@umn.edu

Note: HPAI=highly pathogenic avian influenza, CSF=classical swine fever, ASF=African swine fever.

Glossary

Continuity of Business

The managed movement of non-infected animals and non-contaminated animal products in an FAD outbreak which helps 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 people, animals, animal products, vehicles, and equipment in an area subject to certain criteria.

Permitting

System that allows entities to make necessary movements 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.

Acronyms

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

FAD PReP
Foreign Animal Disease Preparedness and Response Plan

FAD
foreign animal disease

FAZD
National Center for Foreign Animal and Zoonotic Disease Defense, Texas A&M University

FEMA
Federal Emergency Management Agency

FMD
foot-and-mouth disease

HPAI
highly pathogenic avian influenza

IC
Incident Command

ICS
Incident Command System

IP
Infected Premises

NAHEMS
National Animal Health Emergency Management System

NCAHEM
National Center for Animal Health Emergency Management

QMC
quarantine and movement control

SES
Secure Egg Supply

SMS
Secure Milk Supply

SOP
standard operating procedure

SPS
Secure Pork Supply

STS
Secure Turkey Supply

TDD
telecommunications device for the deaf

U.S.C.
United States Code

USDA
US 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), like highly pathogenic avian influenza (HPAI) and foot-and-mouth disease (FMD), are critical measures to safeguard our nation's animal health, public health, and food supply.

There are significant potential consequences of an FAD outbreak in the United States. In addition to the economic impact, the social and psychological impact on both producers and consumers could be severe. The FMD outbreak in the United Kingdom had an estimated impact of between $12–18 billion. Studies have estimated a likely national welfare loss between $2.3–69 billion[1] for an FMD outbreak in California, depending on delay in diagnosing the disease.[2]

Challenges of Responding to an FAD Event

An FAD outbreak will be challenging for all stakeholders. For example, there will be disruptions to interstate commerce and international trade. Response activities are complex, and significant planning and preparation must be conducted before an outbreak. Outbreaks can become large and widespread. Large, geographically dispersed and diverse teams will need to be assembled rapidly and must react quickly. The response effort must have the capability to be rapidly scaled up, involving many times more resources, personnel, and countermeasures. As such, responding to an FAD—large or small—may be a very complex and difficult effort.

Lessons Learned from Past FAD Outbreaks

Past outbreaks both in the United States and in other countries offer important lessons that can be applied to preparedness and response efforts. To achieve successful outcomes in future FAD response, it is vital to identify, understand, and apply these lessons learned:

- Provide unified State-Federal-Tribal-industry planning that respects local knowledge.
- Ensure the unified command sets clearly defined and obtainable goals, and acts with speed and certainty to achieve these goals.

[1] Carpenter TE, O'Brien JM, Hagerman AD, & McCarl BA. 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.

[2] 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 JM. 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.

- Employ science-based and risk-management approaches that protect public health and animal health, stabilize animal agriculture, the food supply, and the economy.
- Ensure guidelines, strategies, and procedures are communicated to and understood by responders and stakeholders.
- Recognize that competing interests may exist during an event, and work to address these issues prior to an event.
- Ensure that there is the capability for rapid detection and effective FAD tracing.
- Acknowledge that high expectations for successful outcomes may require the rapid scale-up of resources and trained personnel in an event.

FAD PReP Mission and Goals

The significant threat and potential consequences of FADs and the challenges of and lessons learned of effective and rapid FAD response have led to the development of the Foreign Animal Disease Preparedness and Response Plan, also known as "FAD PReP." 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 protect public health; 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 US preparedness and response strategy for FAD threats, both zoonotic and non-zoonotic. The following subsections provide brief examples of some of the different types of FAD PReP documents available.

FAD PReP Suite of Documents and Materials

Note: APHIS = Animal and Plant Health Inspection Service, NAHEMS = National Animal Health Emergency Management System, SOP = standard operating procedures.

- Strategic Plans—Concept of Operations
  - *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.
  - *National Center for Animal Health Emergency Management (NCAHEM) Stakeholder Coordination and Collaboration Resource Guide*: This guide identifies key stakeholders with whom NCAHEM collaborates.
  - *NCAHEM Incident Coordination Group Plan*: This document explains how APHIS headquarters will organize in the event of an animal health emergency.
- NAHEMS 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. These documents offer guidance to all stakeholders on capabilities and critical activities that would be required to respond to an FAD outbreak.
- Critical Activity Standard Operating Procedures (SOPs)
  - For planners and responders, these SOPs provide details for conducting 23 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 (commodity specific plans developed by public-private-academic partnerships)
  - *Secure Egg Supply (SES) Plan:* The SES Plan uses proactive risk assessments, surveillance, biosecurity, and other requirements to facilitate the market continuity and movement of eggs and egg products during an HPAI outbreak.
  - *Secure Milk Supply (SMS) Plan:* Currently under development, the SMS Plan will help facilitate market continuity for milk and milk products during an FMD outbreak. This Plan also will employ proactive risk assessments.
  - *Secure Pork Supply (SPS) Plan:* Currently under development, the SPS Plan will help facilitate market continuity for pork and pork products during an FMD, classical swine fever, swine vesicular disease, or African swine fever outbreak.
  - *Secure Turkey Supply (STS) Plan:* Currently under development, the STS Plan will help facilitate market continuity for the turkey sector during an HPAI outbreak.
- Outbreak Response Tools
  - Case definitions, appraisal and compensation guidelines and formulas, and specific surveillance guidance are examples of important outbreak response tools.
- State/Tribal Planning
  - State and Tribal planning is critical for an effective FAD response. These plans are tailored to the particular requirements and environments of the State or Tribal area, taking into account animal populations, industry, and population needs.
- Industry, Academic, and Extension Planning
  - Industry, academia, and extension stakeholder planning is essential: emergency management is not just a Federal or State activity.
- APHIS Emergency Management
  - APHIS directives and Veterinary Services (VS) Memorandums provide critical emergency management policy. APHIS Emergency Management documents provide guidance on topics ranging from emergency mobilization, to the steps in investigating a potential FAD, to protecting personnel from HPAI.

These documents are available on the FAD PReP collaboration website: https://fadprep.lmi.org. For those with access to the APHIS intranet, they are available on the internal APHIS FAD PReP website: http://inside.aphis.usda.gov/vs/em/fadprep.shtml. Key documents are available publicly, http://www.aphis.usda.gov/animal_health/emergency_management/.

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

This appendix contains the Foot-and-Mouth Disease Response Ready Reference Guide for Quarantine, Movement Control, and Continuity of Business. This guide is also available online, at https://fadprep.lmi.org and for those with access to the APHIS intranet: http://inside.aphis.usda.gov/vs/em/fadprep.shtml.

Foot-and-Mouth Disease (FMD) Response

Ready Reference Guide—Quarantine, Movement Control, and Continuity of Business

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.

Continuity of Business (Managed Movement) in an FMD Outbreak

Continuity of business is the management of non-infected premises, non-infected animals, and non-contaminated animal products 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 Control Areas.

How Does Continuity of Business work with Quarantine and Movement Control?

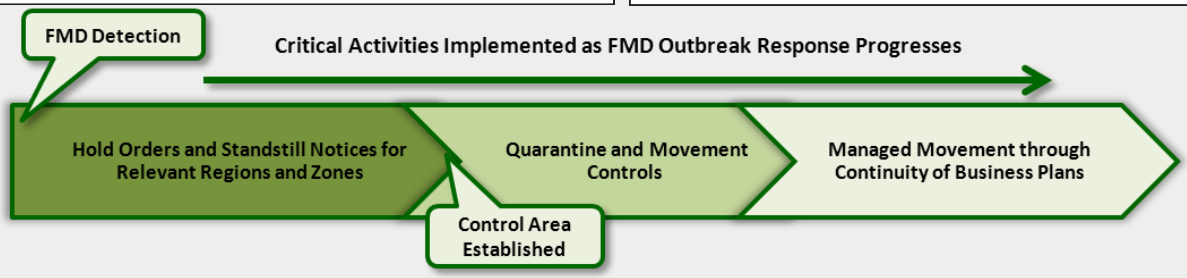
Quarantine, movement control, and continuity of business have **the same ultimate goal:** to prevent the transmission of FMD to non-infected premises, particularly those outside the Control Area. While quarantine and movement restrictions are highly effective at limiting the spread of disease, they also 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 Control Area 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 the 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 Control Area, comprised of an Infected and Buffer Zone, will be designated. Quarantines will be implemented for Infected, Contact, and Suspect Premises in this regulatory Control Area. 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 Control Area, 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

- 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 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 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 stakeholders and experts to prioritize animal or commodity movements that have the potential to be affected by disease disease response.
- 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 an appropriate continuity of business plan for industries or industry segments being addressed.

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.

What are the Current Continuity of Business Planning Initiatives for FMD?

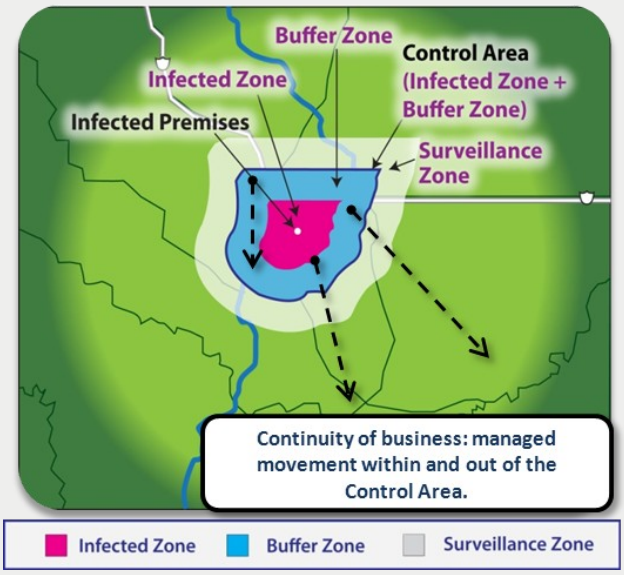
There are a number of successful efforts underway where the government, private sector, and academia are collaborating to improve continuity of business planning for an FMD outbreak. Current planning initiatives include the:

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 outbreak.

The goals of these Secure Food Supply Projects are to

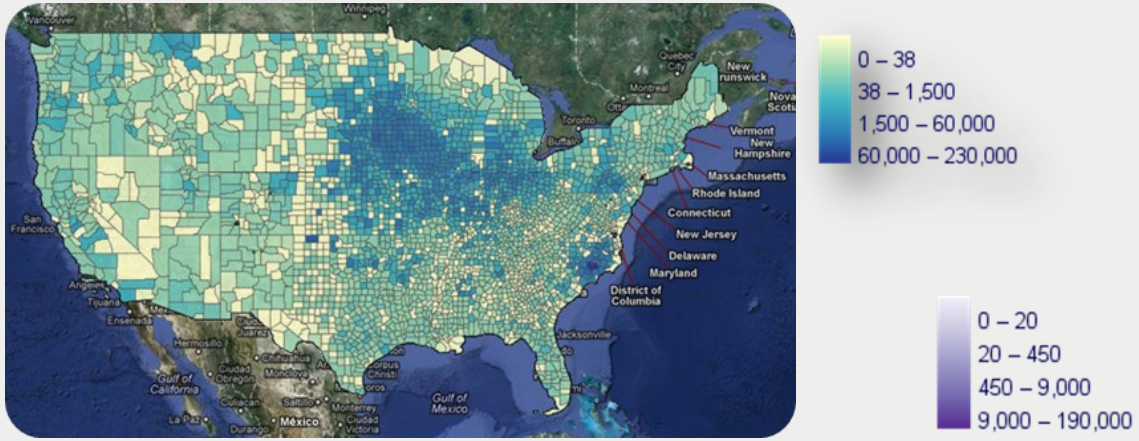
- avoid disruptions in animals and animal product movement to commercial processing from premises with no evidence of FMD infection;
- provide a continuous supply of wholesome food to consumers; and
- maintain business continuity for producers, transporters, and food processors through planning.



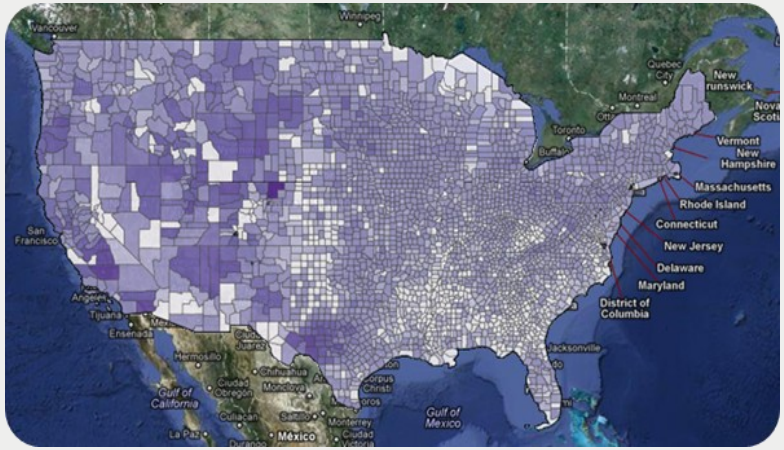
Overview

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.

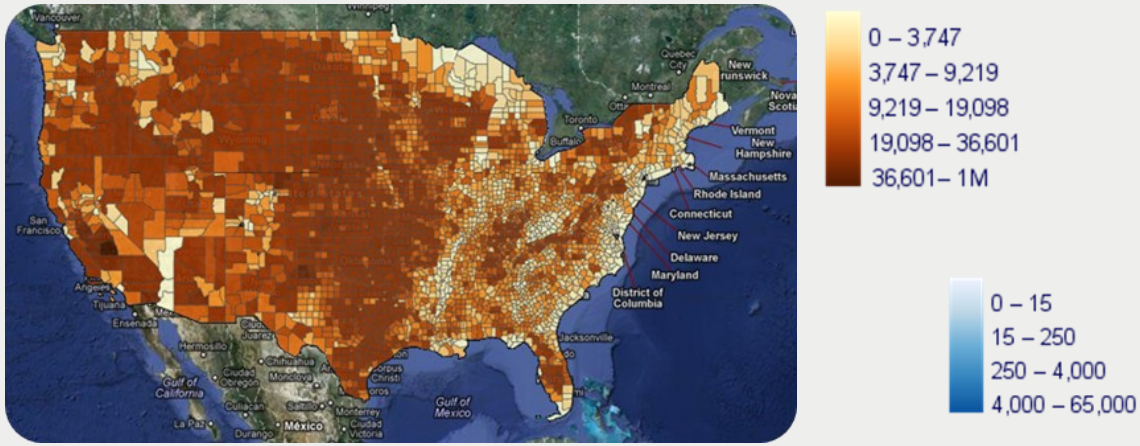
Swine Population by County



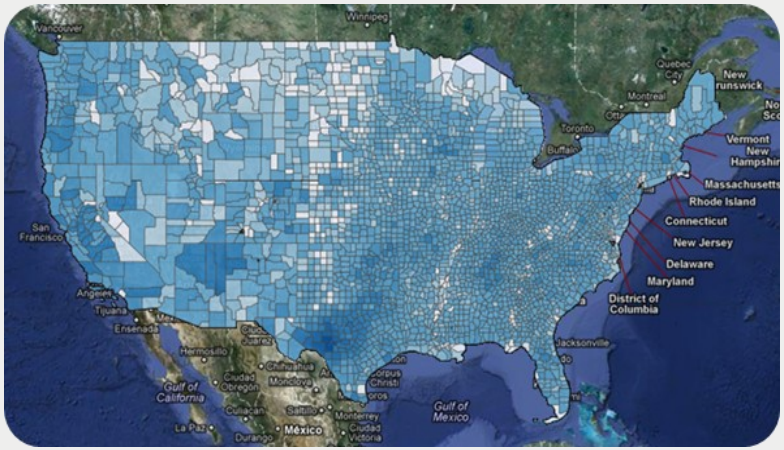
Sheep Population by County



Bovine Population by County

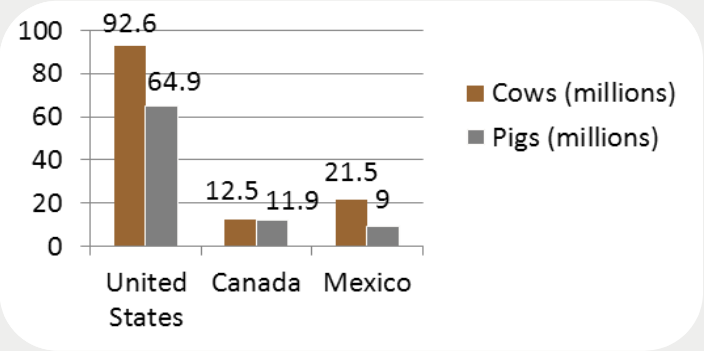


Goat Population by County

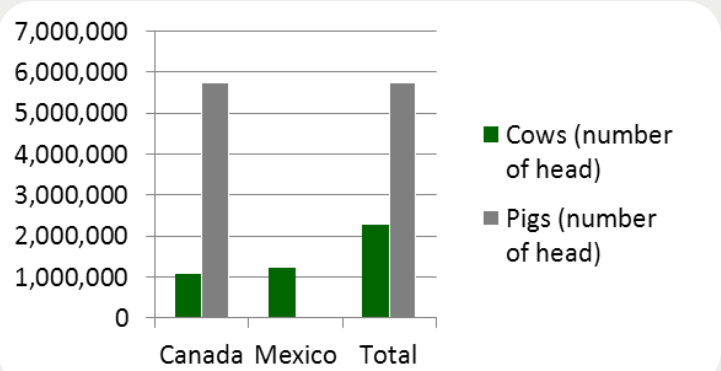


Source: National Agricultural Statistics Service, 2007.

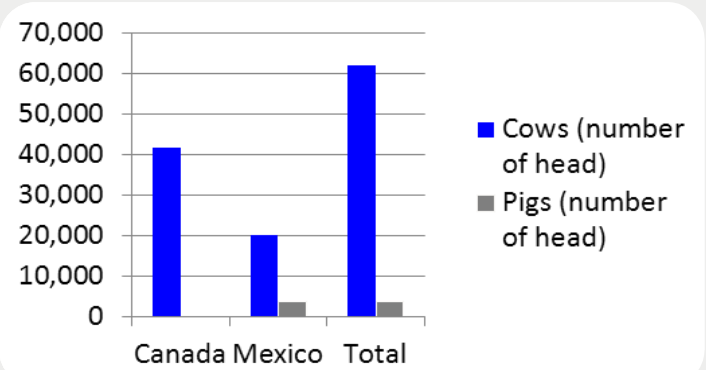
Swine and Bovine Inventory—North America



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

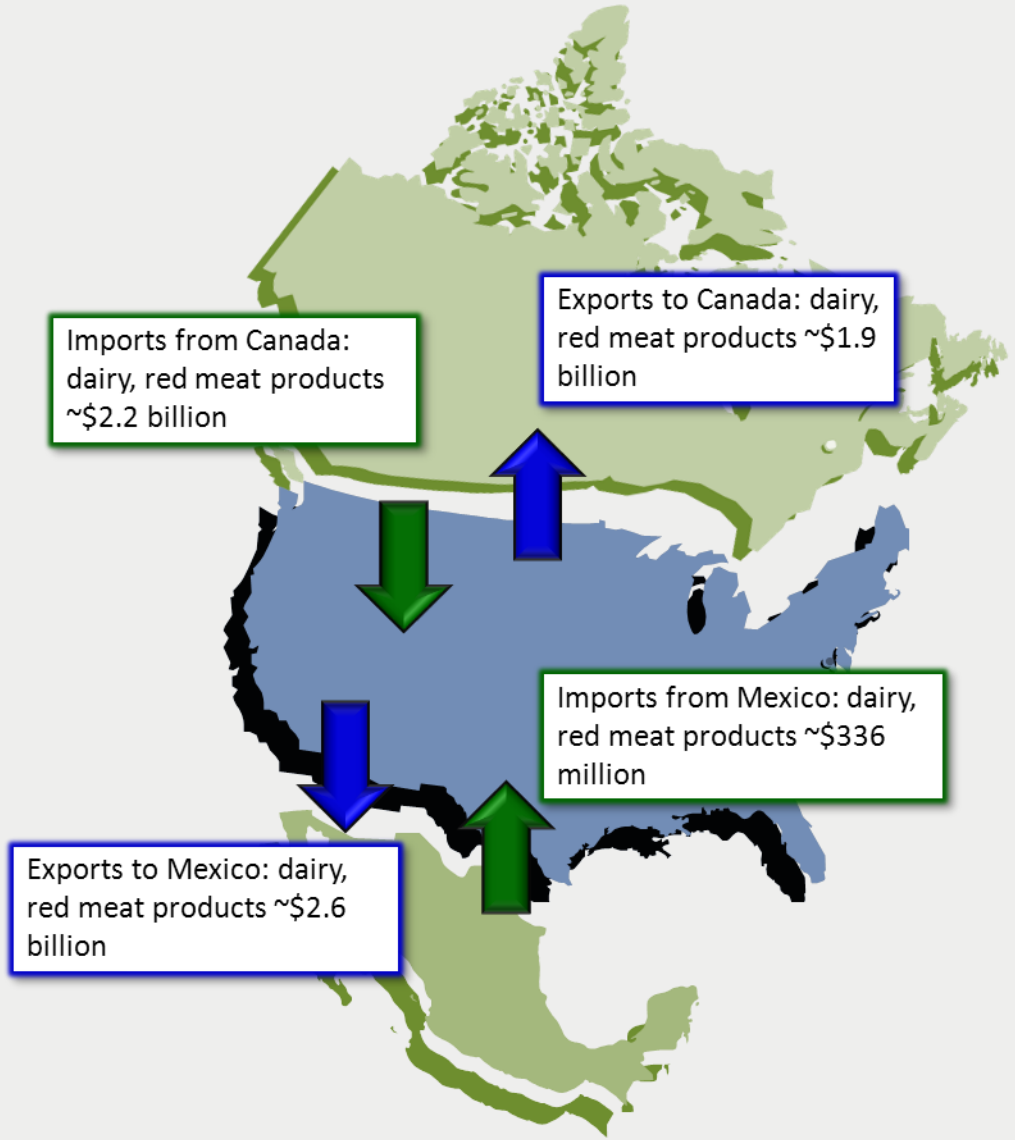


U.S. Exports to Mexico and Canada (Live Animals)



Source: USDA Economic Research Service, 2011 (2010 data)

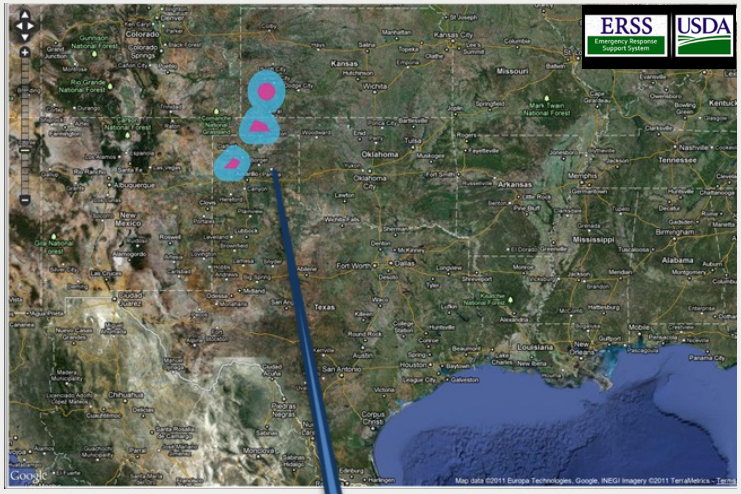
U.S. Product Imports and Exports to Canada and Mexico (Value)



Source: USDA Foreign Agricultural Service, 2011 (2010 data)

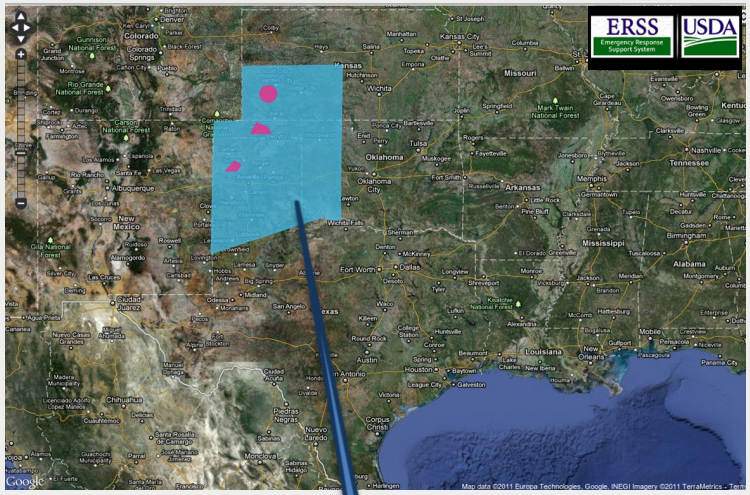
Control Areas in an FMD Outbreak (Small and Medium)

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

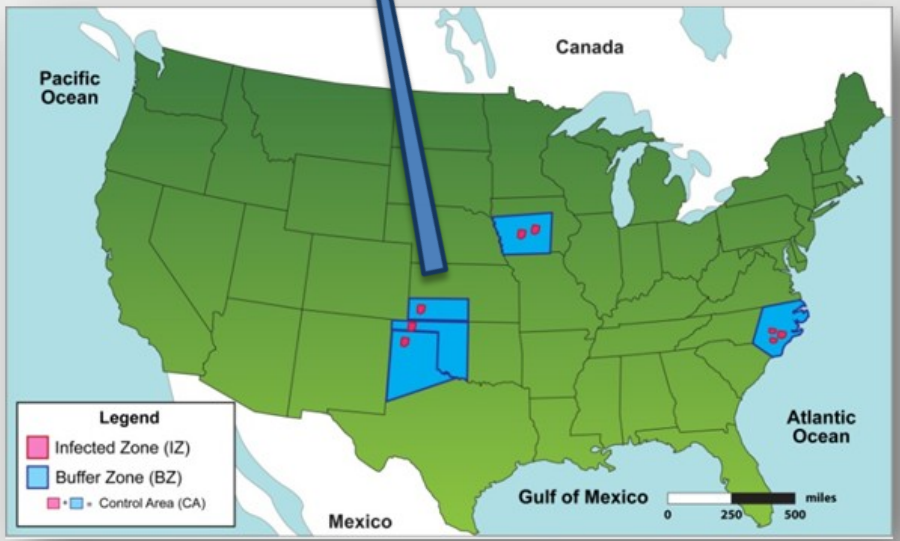
Affected:
~5.7 million livestock
~9,300 operations



Medium Control Areas

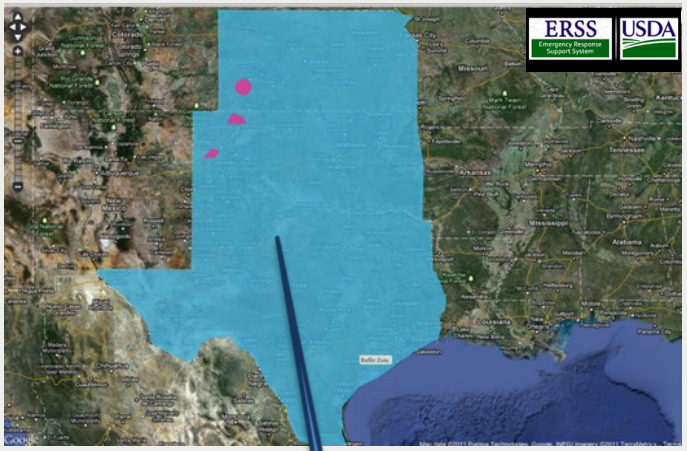
Affected:
~17.8 million livestock
~34,000 operations

Data source: National Agricultural Statistics Service, 2007.



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:
~33.7 million livestock
~290,000 operations

Data source: National Agricultural Statistics Service, 2007.

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.