Secure Milk Supply (SMS) Plan for Continuity of Business

2026

Table of Contents

Introduction

The Secure Milk Supply (SMS) Plan provides a continuity of business (COB) framework for dairy premises with cattle **affected** by movement controls **but not infected** with foot and mouth disease (FMD) or a similar contagious disease. It describes dairy industry preparation for, and Regulatory Officials (local, state, tribal and federal officials) response to, this type of disease outbreak. Participation is voluntary.

Producers and Regulatory Officials have important roles in the prevention and control of FMD or a similar contagious disease. Strategies will vary based on the disease, its impact on animal health, public health, diagnostic tests, use of emergency vaccination, trade implications, and resource availability. Disease responses evolve over the course of an outbreak as more is known, and as it moves from containment to control to disease freedom.

One strategy to control and contain the spread of contagious animal diseases is through movement restrictions of susceptible livestock species, germplasm (semen, embryos, oocytes) and animal products (raw milk and colostrum). The dairy industry relies on the ability to move:

- Raw milk to processing for human consumption (referred to as "commerce"),
- Raw milk and colostrum for animal feed,
- Cattle with no evidence of infection between production phases (calf rearing, breeding, dry cows),
- Cattle to slaughter, and
- Semen and embryos for breeding and genetic improvement.

Prolonged movement restrictions will negatively impact animal welfare, the livestock industry, and potentially the food supply. Regulatory Officials must balance the risks of allowing movement for business continuity with disease control goals to protect the state or nation's herd. States in which sales of raw milk for human consumption is legal should take this into consideration during an outbreak response.

Purpose

The SMS Plan and resources help dairy producers, milk haulers/drivers, and processors prepare ahead of time rather than during the chaos of an outbreak. The SMS Plan also includes movement permit guidance criteria for livestock operations *affected* by movement restrictions but *not infected* with FMD or a similar contagious disease. The SMS Plan aims to support business continuity while not spreading disease. Producers can use the guidance in the SMS Plan to:

- Develop contingency plans for interrupted movement,
- Limit exposure to uninfected herds through enhanced biosecurity,
- Learn how to find early signs of disease,
- Request movement permits from State Officials for raw milk (if required) and healthy animals going to harvest or another premises, and
- Continue to supply safe and wholesome milk to consumers.

The SMS Plan and related resources were created for use in the event of an FMD outbreak in the United States. FMD is a highly contagious foreign animal disease that infects cattle and other cloven-hoofed livestock, such as swine, sheep, goats, and deer. The U.S. eradicated FMD in 1929, yet it is present in two-thirds of the countries of the world. FMD is not a public health or food safety concern; it is an animal disease. The SMS Plan was modified to address emerging animal diseases following the 2024 incursion of highly pathogenic avian influenza (HPAI) A (H5N1) virus in U.S. dairy cattle. HPAI is a contagious disease that infects wild birds, poultry, and over 100 mammal species, including cattle and humans.

The SMS Plan is the result of a multi-year collaborative effort by industry, state, federal, and academic representatives. Funding for its creation and modification was provided by the USDA Animal and Plant Health Inspection Service (APHIS) and the USDA National Animal Disease Preparedness and Response Plan (NADPRP), respectively. The SMS Plan provides **guidance** only. In an actual outbreak, decisions will be made by Regulatory Officials based on the unique outbreak characteristics.

Managed Movement in an FMD Outbreak

National Movement Standstill (Stop Movement)

USDA recommends a 72-hour national movement standstill of susceptible species, semen, and embryos once FMD is diagnosed. Learn more about What to Expect in a National Movement Standstill. During this time, regulatory Control Areas with a minimum of 6-mile radius from the perimeter of the Infected Premises will be set. Farms that are Infected, Suspect (under investigation), or in Contact with those farms will be managed under the guidance in the USDA FMD Response Plan, also called "The Red Book". Pending the outbreak investigation, the standstill may be extended past 72-hours. The FMD Red Book, 2020, states,

> "A national/regional movement standstill notice does not affect movement of milk. Premises may continue moving milk to processing. All premises moving milk must implement, monitor, and enforce their premises biosecurity plans to reduce the risk of FMD introduction. States may choose to implement additional or alternative guidance for premises needing to move milk."

Other outbreaks of contagious diseases may result in premises quarantines or stop movement at the state or national level depending on the ways in which the disease spreads and the regulatory authority of animal health officials. Refer to the Managed Movement in a Contagious Disease Outbreak section in this document for more details.

Risk Assessments for Raw Milk Movement

Two proactive risk assessments (RA) evaluated the risk of FMD virus spread when raw milk is transported from an infected, but undetected, Grade A dairy farm to further processing (commerce). Full reports and fact sheets are available on the SMS website Movement Permits page. Executive summary links are provided. The Baseline RA (2013) identified areas of risk based on current industry standards, in addition to the Food and Drug Administration (FDA) Grade "A" Pasteurized Milk Ordinance (PMO) guidance and state regulations, with no additional mitigations or restrictions in place. The second BPS RA (2016) evaluated the effectiveness of the SMS Biosecurity Performance Standards (BPS) for Raw Milk Collection and Transport measures and concluded:

> "The risk of FMDv contamination of a susceptible farm by contaminated milk and environmental media through the transport of raw milk into, within, and outside of a Control Area to processing is **negligible to moderate** provided the Pasteurized Milk Ordinance (PMO) guidance, state regulations, and the BPS for Raw Milk Collection and Transport are strictly followed."

Continued Movement of Raw Milk to Commerce in an FMD Outbreak

The FMD virus is not a threat to food safety or human health. Cows can shed FMD in their milk for two to four days before showing clinical signs, exposing other susceptible animals. There is a risk that FMD virus will enter commerce before detection at the farm level. The risk of animal exposure comes when raw milk is rejected for human consumption and is diverted to animal feed. Refer to the Survivability in Milk and Milk Products section in this document for more details.

States that stop raw milk movement to commerce in an outbreak (during the standstill or after) may require producers to get a raw milk movement permit after meeting specific criteria such as that found in Table 1. Stopping raw milk movement to commerce may result in dumping milk on farm while the dairy prepares to meet the movement criteria. As states plan their response for raw milk movement to commerce, consider:

- Prolonged dumping on farms can pose environmental concerns even for uninfected farms.
- Infected, undetected farms dumping milk could expose susceptible wildlife and livestock to FMD.
- In a large outbreak or with prolonged stoppage, dumping milk could lead to shortages of milk and milk products for consumers.
- Dumping milk could send the erroneous message that milk is not safe for human consumption.
- Paying producers for dumped milk could depend on the states and the federal government's ability to provide compensation for losses.
- Requesting raw milk movement records from producers and/or milk procurement companies for traceability purposes if FMD is found in their state.

Restarting Movement

Once the national movement standstill lifts, movement restrictions may be put in place for the Control Area(s) to limit the risk of disease spread by animals, animal products, vehicles, and other items. Movement into, within, or out of Control Area(s) will be by permit only and based on the risk posed. Some movements (live animals) carry more risk than others (raw milk direct to commerce).

Decisions on raw milk movement will depend on factors unique to each outbreak and Control Area. Raw milk from an FMD Control Area should meet the standards in the FDA PMO for commerce, and the World Organization for Animal Health (WOAH) Terrestrial Animal Health Code (TAHC) Chapter 8.8, Infection with Foot and Mouth Disease Virus, 2024, Standards for the Treatment of Raw Milk for animals. Both sources recommend applying a minimum temperature of 72°C [161°F] for at least 15 seconds (high temperature – short time pasteurization [HTST]). The guidance in the SMS Plan builds on that foundation.

Movement Permit Guidance Criteria: FMD

Each State Animal Health Official (SAHO) has the authority to determine movement permit criteria within their state. States may require some or all the movement permit guidance criteria in the SMS Plan to be met for dairy farms in an FMD Control Area. All interstate movements must meet existing movement/state entry requirements in addition to outbreak-specific conditions. The SMS Plan recommendations include:

- Dairy premises in an FMD Control Area that are **designated as Infected, Suspect, or Contact**† **Premises** should not be allowed to move **raw milk** to commerce unless a permit is issued by Regulatory Officials.
- Dairy premises in an FMD Control Area that are **designated as Infected, Suspect or Contact**† **Premises** should not be allowed to move **raw milk** off site to feed susceptible species; they are not permit eligible.
- Dairy premises in an FMD Control Area that are **designated as Infected, Suspect, or Contact**† **Premises** should not be allowed to move **cattle** (or other susceptible species); they are not permit eligible.
- Dairy premises in an FMD Control Area that are **designated as At-Risk or Monitored Premises** should meet a set of defined criteria when requesting a permit to move susceptible animals or products within, or out of, the Control Area. The criteria are listed in Table 1 and Appendix A. Criteria for bovine germplasm (semen, embryos, oocytes) and high genomic merit animals is described in the Bovine Germplasm Movement Plan (BGMP). Additional details are included in the Documentation section of this document.

† Contact Premises is intended to be a short-term designation. Should clinical signs appear (contact led to exposure), status will change to a Suspect Premises and an investigation will ensue. Similarly, movement records (animals, animal products) may provide evidence that there was no "dangerous" contact with known Infected Premises or animals, and the status would change to an At-Risk Premises.

Table 1. Movement Permit Guidance Criteria for Dairy Farms Located within an FMD Control Area

Raw Milk to Commerce (If permit required by state)	
Traceability information is available (PIN, GPS Coordinates) and records provide evidence dairy is NOT a Contact Premises	Yes
No evidence of infection based on monitoring for disease (surveillance); Dairy operation is NOT an Infected or Suspect Premises	Yes
Biosecurity Performance Standards for Raw Milk Collection and Transport are in place and acceptable* to Regulatory Officials	Yes
Regulatory Officials may issue a movement permit if all above conditions are met	

Raw Milk for Animal Feed	
Traceability information is available (PIN, GPS Coordinates) and records provide evidence dairy is NOT a Contact Premises	Yes
No evidence of infection based on monitoring for disease (surveillance); Dairy operation is NOT an Infected or Suspect Premises	Yes
The items listed in the Enhanced Biosecurity Checklist are in place and acceptable* to Regulatory Officials	Yes
Milk is treated to WOAH standards	Yes
Regulatory Officials may issue a movement permit if all above conditions are met	

Cattle	
Traceability information is available (PIN, GPS Coordinates) and records provide evidence dairy is NOT a Contact Premises	Yes
No evidence of infection based on monitoring for disease (surveillance); Dairy operation is NOT an Infected or Suspect Premises	Yes
The items listed in the Enhanced Biosecurity Checklist are in place and acceptable* to Regulatory Officials	Yes
Destination premises and state are willing to accept the cattle	Yes
Regulatory Officials may issue a movement permit if all above conditions are met	

More information about cattle movement is provided in the Secure Beef Supply Plan.

**Acceptable may be determined by the checklist or written biosecurity plan review on paper, electronically or in person, prior to or during an outbreak pending available state resources.*

Prepare Before an FMD Outbreak

Preparedness is like insurance. There is a cost investment relative to the assets that need protection. Preparing before an outbreak can be a more effective use of resources.

Contingency Planning

Producers

Producers should have a contingency plan for movement restrictions – for at least 72-hours – when raw milk/colostrum for animal feed, and calves, heifers, bulls, steers, dry cows, or fresh cows moving to the next phase of production is stopped. It may take more days, even weeks, for the livestock industry, state, and federal officials to understand the extent of an outbreak. Providing records to demonstrate there was no contact with Infected Premises can take time if records are not kept prior to an outbreak. Monitoring for disease and documenting no evidence of infection could take additional time (up to 14 days or longer) to show animal movement from farms in Control Areas will not cause an increased risk of disease spread. The Dairy Producer Contingency Planning: Movement Restrictions guidance document includes options to support animal well-being and business continuity.

Milk Haulers/Drivers

The SMS Plan assumes raw milk movement to commerce will continue in an FMD outbreak from At Risk and Monitored Premises. Milk haulers/drivers are critical to business continuity. Producers should identify a process for prompt communication of their herd's status and expectations with hauling companies. Milk haulers/drivers should familiarize themselves with the guidance in Sections 3, 4, 5, and 6 of the Biosecurity Performance Standards (BPS) for Raw Milk Collection and Transport to know what biosecurity steps will be needed in an FMD outbreak to limit virus spread. Contingency plans may involve planning for the extra time

spent at each stop and who is responsible for providing supplies (boots, gloves, disinfectants, etc.) to meet biosecurity expectations. Routes and points of delivery may also shift if new farms become infected.

Milk Cooperatives/Processors

Milk cooperatives/processors are essential to business continuity for the dairy industry during a disease outbreak. Guidance is provided in the Biosecurity Performance Standards (BPS) for Raw Milk Collection and Transport to help cooperatives/processors develop a contingency plan. Section 6 has some actions that require collaboration with State Officials, which is best done before the chaos of an outbreak. All SMS Plan guidance aligns with the Food and Drug Administration (FDA) PMO for the continued assurance that milk and milk products are safe and wholesome for human consumption.

Livestock Haulers/Transporters and Beef Packers and Processors

Movement of calves, dairy beef, and cull cattle are other critical business continuity and animal well-being needs of the dairy industry. This is where there is a direct overlap with the guidance in the Secure Beef Supply (SBS) Plan. Refer to the SBS Contingency Planning Guide for Haulers and Transporters for important steps that can be taken. Also, The Meat Institute provides foreign animal disease guidance documents for packers to contingency plan prior to an outbreak.

Traceability

The **raw milk and cattle movement permit guidance criteria** states: "*Traceability information is available (PIN, GPS Coordinates) and records provide evidence dairy is NOT a Contact Premises.*"

Obtain a National Premises Identification Number (PIN)

A National Premises Identification Number (PIN or PremID) will be required to request a movement permit in an outbreak. The office of the SAHO where the animals are located can provide producers and processors with a PIN, free of charge. USDA provides an interactive map on their animal disease traceability web page. A PIN is linked to the geospatial location reflecting the actual location of the animals on the premises. This includes a valid 911 address and/or a set of matching GPS coordinates (latitude and longitude). A PIN is required for both the premises of origin and the premises of destination. Read more about dairy premises identification: why it is needed and how it is used.

Producers and packers are encouraged to validate their PIN with SAHOs to ensure their data on file accurately represents the location of the animals and not a mailbox at a residence or business affiliated with the animal premises. Validated PINs speed up communication and response during an outbreak. The National Pork Board provides an online premises verification resource for all species. Submit corrections to the office of your SAHO.

Milk cooperatives and processors need to have a PIN for the destination plant. If requesting raw milk movement permits on behalf of their producers, they need to work with their producers to ensure they meet the criteria listed in Table 1. In lieu of raw milk movement permits, the SAHO may request movement records (manifests) for traceability purposes.

Milk quality labs receiving raw milk samples from Control Areas will also need to have a PIN for traceability purposes in an outbreak.

Maintain Movement Records

In an outbreak, contact tracing will occur to see how far and wide the disease may have spread through movements. Keeping accurate records **before** an outbreak can help producers quickly provide information to demonstrate that their animals, raw milk, manure, personnel, vehicles, or equipment were not in contact with known infected herds or flocks. This preparedness step could lessen the impact on a dairy's business continuity. The SMS website has animal movement, people, and delivery record keeping forms with the key details needed to determine if a "dangerous contact" happened. Records do not have to be electronic or on these specific forms so long as the details listed are kept. Accurate records speed up investigations. Producers in Control Areas or in Contact with Infected or Suspect Farms will also need to provide additional information, like what is found in the Secure Milk Supply Practice Questionnaire for FMD Exposure. The faster details are provided to animal health officials when requesting a movement permit, the quicker a permit decision can be made.

Enhanced Biosecurity

Current biosecurity plans for dairies may protect animals against common diseases, but stronger (enhanced) measures are needed for FMD and similar contagious diseases. Writing, reviewing annually, and updating enhanced biosecurity plans prior to an outbreak is strongly recommended. Annual review of enhanced biosecurity plans is encouraged so that updates can be made to account for changes in personnel, animal management practices, or the scope of the operation.

The **raw milk movement to commerce permit criteria guidance** states: "*Biosecurity Performance Standards (BPS) for Raw Milk Collection and Transport are in place and acceptable to Regulatory Officials.*" The BPS document describes the steps needed for the dairy site, milk hauler/truck driver, and the milk truck/tanker to limit FMD virus spread. Suggested steps to meet those standards are included in the Enhanced Biosecurity Plan Checklist, specifically under these section titles: protecting the dairy herd; vehicles and equipment; personnel; and animal and product movement.

The **cattle movement permit criteria guidance** states: "*The items listed in the Enhanced Biosecurity Checklist are in place and acceptable to Regulatory Officials.*" The Biosecurity Manager should ensure that a site-specific enhanced biosecurity plan is written that describes how each item in the Self-Assessment Checklist for Enhanced Biosecurity: Dairy will be met. Visit the SMS website for the Information Manual for Enhanced Biosecurity, and template to create a site-specific, written, enhanced biosecurity plan for their dairy. These resources include the BPS and other prevention practices designed to prevent disease exposure from multiple routes (carcasses, manure, wildlife, etc.). The National Dairy Farmers Assuring Responsible Management (FARM) Program also provides dairy farmers and industry partners with a free online training course to learn more about writing an Enhanced Biosecurity Plan which aligns with the Self-Assessment Checklist. Farmers, veterinarians, and other advisors can enter plans into the FARM Database: Enhanced Biosecurity and choose to share with state officials for review before, or upon request, in an outbreak.

If a dairy site already has a written biosecurity plan, compare it to the Self-Assessment Checklist to find gaps (items "in progress" or "not in place"), then modify it to ensure each item is "in place" to limit exposure to FMD or a similar contagious disease. If unsure, contact the Office of your SAHO to discuss what may be needed in an outbreak.

Monitor for Disease

The **raw milk and cattle movement permit criteria guidance** states: "*No evidence of infection based on monitoring for disease (surveillance); Dairy operation is NOT an Infected or Suspect Premises.*"

Monitoring animals involves watching them closely for early signs of disease (screening) and testing as needed (also known as surveillance). FMD laboratory testing protocols for **non-clinical animals** have not been established. Accurate and precise tests are available for clinical animals (e.g., testing vesicular fluid, serum). Sample size and testing frequency guidance will be provided by USDA Center for Epidemiology and Animal Health based upon the outbreak characteristics, virus strain, and the surveillance plan factors.

Screening animals involves training Cattle Health Monitors – people who normally look at the cattle and can recognize when something is "off" – to find early signs of disease. Keeping good health records before an outbreak can show the "normal" ranges for production parameters like feed intake, lameness, decreased milk production, and death of young nursing calves. The SMS website has resources to learn how to observe animals for early signs of FMD, record what they see, and report when something is "off" or abnormal. The FMD Response Plan describes this process as Active Observational Surveillance (AOS). Producers can also work with a USDA Category II Accredited Veterinarian as they have training in how to look for FMD and emerging diseases. USDA provides an on their website.

Response to an Outbreak

Producers, cooperatives, processors, haulers/drivers, and Regulatory Officials all have responsibilities in an FMD or similar contagious disease outbreak. The following actions are aimed at dairies in an FMD or similar contagious disease Control Area.

Producer Actions

- Put the contingency plan for interrupted movement in place.
- Obtain a National PIN for locations where animals are held; update contact information for existing PINs as needed.
- Ensure accurate **movement records** are available for traceability.
- Review, update as necessary, and put the site-specific **enhanced biosecurity plan** in place.
- **Monitor for disease**, record observations, and report any abnormal findings.
- Work with your herd veterinarian to review your written biosecurity plan and to train Cattle Health Monitors to identify signs of FMD.
- **Communicate** with the milk procurement company and next location to receive animals to ensure they are willing to accept movements from a Control Area.

Milk Cooperative, Processor, Milk Hauler/Driver Actions

- Follow the biosecurity guidance for plant employees, milk haulers, and truck drivers in the SMS Biosecurity Performance Standards for Raw Milk Collection and Transport.
- Communicate with producers about any changes to collection and transport steps.
- Communicate with State Officials about procedures to provide raw milk movement records.
- Be ready to implement your contingency plan for rejected loads and expired grocery store dairy product returns that meet WOAH standards if destined for animal feed.

Regulatory Official Actions

States with an FMD outbreak or similar contagious disease will be focused on containing and controlling the disease as quickly as possible. Resources may be limited to support business continuity despite its importance. There are several critical activities happening simultaneously, including but not limited to:

- Quarantine, stop movement, and biocontainment of the Infected Premises.
- Quarantines on premises with susceptible species in a Control Area.
- Trace back/trace forward of all susceptible species movements from Infected Premises.
- Rapid investigation of Suspect and Contact Premises.
- Surveillance in and around the Control Area(s).
- Depopulation, disposal, and virus elimination activities on Infected Premises as dictated by the response strategy.
- Permitting critical/essential movements.
- Providing guidance to producers on requirements for movement permits.
- Preparing to implement emergency FMD vaccination as dictated by the response strategy.

Managed Movement in a Contagious Disease Outbreak

Managed movement of animals and milk in a contagious disease outbreak may not follow the same strategy as FMD. Establishing Control Areas around Infected Premises and a national movement standstill may not be put in place. SAHOs have authority to determine movement permit criteria within their states. All interstate movements must meet existing movement/state entry requirements in addition to outbreak-specific conditions. Current regulation of movement restrictions is based on diseases that are on the National List of Reportable Animal Diseases. If a contagious disease is newly recognized (emerging), Regulatory Officials may not have the authority to respond with prescribed plans like those in place for FMD. Next is a description of how movements were handled when the contagious disease, HPAI H5N1 in dairy cattle, was discovered in March 2024.

Movement Permit Guidance Criteria: HPAI H5N1

Within days of the H5N1 in dairy cattle announcement, individual states restricted dairy cattle entry from states with confirmed H5N1 dairy cattle cases to protect the animals in their state. Some states implemented quarantines for dairies with positive cattle, varying from stopping intra- and interstate movement of all cattle to just lactating cows. Control Areas were never established, nor was a 72-hour standstill implemented.

Movement permit criteria during the 2024-25 HPAI H5N1 outbreak in dairy cattle included:

- Mandatory pre-movement testing of milk from lactating dairy cattle going interstate with negative results from a National Animal Health Laboratory Network (NAHLN) lab.
- This was the result of the Federal Order announced by the USDA on April 29, 2024.
- Valid PIN for dairies submitting samples for testing.

Enhanced biosecurity was also recommended. The HPAI movement regulations in place up until March 2024 were written to safeguard the poultry industry from infected poultry movements.

Monitor for Disease: HPAI H5N1

Dairy farmers used their monitoring skills to recognize something was abnormal (screening). Working with their herd veterinarians, milk testing at the NAHLN labs and the USDA National Veterinary Services Laboratories revealed the cause of this emerging contagious disease was HPAI H5N1. A case definition was created by USDA, and protocols for conducting testing were created. These evolved over the outbreak as more was learned.

Another Federal Order was announced on December 4, 2024, when the USDA implemented the National Milk Testing Strategy (NMTS). The NMTS and accompanying guidance required that raw (unpasteurized) milk samples be collected and shared with the USDA for testing. The testing was designed to identify which states and specific herds within were affected, support rapid implementation of enhanced biosecurity measures to decrease the risk of transmission to other livestock, and inform critical efforts to protect farm workers to help lower their risk of exposure.

The NMTS places the participating states into one of five stages based on the prevalence in that state to eliminate HPAI H5N1 at the state, regional, and national levels. The five stages as of April 2026 are:

- Stage 1: Standing Up [Begin] Mandatory USDA National Plant Silo Monitoring
- Stage 2: Determining a State's H5N1 Dairy Cattle Status
- Stage 3: Detecting and Responding to the Virus in Affected States
- Stage 4: Demonstrating Ongoing Absence of H5 in Dairy Cattle in Unaffected States
- Stage 5: Demonstrating Freedom from H5 in U.S. Dairy Cattle

The events of the 2024-25 H5N1 outbreak in dairy cattle showed how vulnerable the U.S. livestock industry is to an emerging contagious disease, the similarities and differences between this response and FMD, and the importance of the SMS Plan as business continuity plan framework and reference for the dairy industry.

Raw Milk Handling Recommendations for an Emerging Contagious Disease – HPAI

- Ensure that the implementation of the site-specific enhanced biosecurity plan and monitoring for disease is in place.
- Raw milk leaving an HPAI Infected or Suspect Premises for animal feed should be high-temperature, short-time (HTST) pasteurized (minimum temperature of 72°C [161oF] for at least 15 seconds) or subjected to any equivalent treatment that has been demonstrated to inactivate the virus in milk. Steps should be taken after processing to avoid contact of the treated milk with any potential source of virus.[1]
- Raw milk for commerce from dairies with HPAI infected cattle should be pasteurized according to the PMO; abnormal milk should not enter commerce.

Disease Response Guidance Documents

FMD

There are several guidance documents for Regulatory Officials to use in an FMD Outbreak, and the SMS Plan aligns with them.

[1] U.S. Food and Drug Administration. "Investigation of Avian Influenza A (H5N1) Virus in Dairy Cattle." March 2025 at: www.fda.gov/food/alerts-advisories-safety-information/investigation-avian-influenza-h5n1-virus-dairy-cattle.

- **Strategic guidance** for responding to FMD in the United States can be found in the following *Foreign Animal Disease Preparedness and Response Plan (FAD PReP)* documents:
  - *Foot-and-Mouth Disease Response Plan: The Red Book*, Oct 2020
  - *Ready Reference Guides*, which accompany many of the detailed documents and materials below, offer quick summaries of the information for training and educational purposes.
- Strategies for a managed response to an FMD outbreak will change as the outbreak progresses (phase) and will depend upon the magnitude (type), location of the outbreak, vaccine availability, and other characteristics.
  - These pre-defined **phases and types of an FMD outbreak** are described in the guidance document *FAD PReP Classification of Phases and Types of a Foot-and-Mouth Disease Outbreak and Response*. This document helps facilitate the development of adaptable emergency response and business continuity plans for the U.S. livestock industry in the event of an FMD outbreak in North America.
- **Surveillance, epidemiology, and tracing** techniques will be utilized by Responsible Regulatory Officials during the outbreak to detect new cases, understand and adapt to the outbreak situation, and provide information for decision making and disease control procedures. The USDA has developed the *FAD PReP/National Animal Health Emergency Management System (NAHEMS) Guidelines: Surveillance, Epidemiology, and Tracing*. These activities likely will lead to additional regulatory activities such as quarantine and movement controls.
  - **Animal surveillance** methods to demonstrate a lack of evidence of FMD infection to allow animal and/or product movement to support business continuity without spreading infection are described in *Surveillance Guidance to Support the Secure Milk Supply (SMS) Continuity of Business Plan during an FMD Outbreak*. This document discusses current limitations of testing individual cattle to provide a high degree of confidence that herds are not infected. These limitations are likely to slow the ability to move cattle in a Control Area at the beginning of an outbreak. It is not possible to prove that an animal is not infected with FMD. It is only possible to establish the lack of evidence of infection.
  - **Bulk-tank Milk Surveillance:** Cattle can shed FMD virus in their milk 2-4 days prior to the onset of clinical signs. FMD is not a public health or food safety concern. Identifying infected premises during the subclinical phase could be done by testing bulk-tank milk using real-time reverse transcription polymerase chain reaction (rRT-PCR). Bulk-tank milk samples must be transported to a NAHLN lab for testing; milk quality testing labs have not been USDA approved to perform this test. This screening test is not designed to be a just-in-time test for permitting daily milk movement (raw or pasteurized) during an outbreak due to the length of time required for sample delivery and testing (minimum of 8 hours). Rather the test can identify FMD virus fragments in the milk sample, indicating one or more lactating cattle that contributed to the bulk-tank milk sample are shedding virus, helping to identify newly infected dairy herds. More information is provided in *Potential uses of a rRT-PCR assay for FMD in bulk-tank milk in the United States*, September 2017.
- **Quarantine and movement controls** are critical activities to control FMD. These approaches include establishing a Control Area around each infected premises and issuing movement restrictions for cattle and other susceptible animals and their products in a Control Area. The USDA has developed the *FAD PReP/NAHEMS Guidelines: Quarantine and Movement Control* to describe these measures.
- **Continuity of business (COB)** activities for premises with no evidence of infection in a Control Area aim to minimize disruptions in commerce caused by quarantine and movement restrictions and decrease the economic consequences of an FMD outbreak. The USDA developed *FAD PReP/NAHEMS Continuity of Business (COB) Guidelines*. These guidelines provide the basis for managed movement – which is an important component of business continuity – of animals with no evidence of infection and their products from within a Control Area in a foreign animal disease incident.

- **Emergency response management** during an FMD outbreak involves considerable amounts of data, including investigation records, premises identification numbers, individual animal and herd-level laboratory test results, movement permits, and resource allocation information. Producers in a Control Area may be required to have a National PIN to request movement permits in an outbreak. States are encouraged to enter their premises data into the USDA Emergency Management Response System (EMRS) prior to any outbreak. EMRS is the USDA APHIS official system of record for all animal health incidents; therefore, all data needed to request movement permits will need to be entered into EMRS. This greatly facilitates response efforts. For more information, refer to *USDA Premises Data Transfer to EMRS from External/State-Based Systems,* June 15, 2020*,* and *Ready Reference Guide – Introduction to EMRS2*, January 2020.

Emerging Contagious Diseases – H5N1

The USDA APHIS website has dedicated pages with information on H5N1 influenza that are updated as new information is available. Interactive detection information for commercial and backyard flocks, wild birds, livestock, and mammals can be viewed. Outbreak response and support materials are available for dairy producers and cooperators. Information for Biosecurity Enhancement, Financial Assistance, and the Dairy Herd Status Program is available.

The National Milk Producers Federation website has H5N1 in Dairy Cattle informational resources. Topics covered include Food Safety, Monitoring for H5N1 in Dairy Herds, Biosecurity Guidance, Workforce Safety Guidance, Testing & Reporting, Available Federal Support, and FARM Program Expectations.

Survivability in Milk and Milk Products

FMD

Cattle can shed FMD virus in their milk two to four days prior to the onset of clinical signs. It must be assumed that, in some cases, milk from infected and undetected herds will enter commerce. FMD is not a threat to food safety or human health. "In contrast to raw milk, no [FMD] outbreaks have ever been attributed to pasteurized dairy products."[2] The potential for FMD transmission to animals occurs when raw or single high-temperature, short-time (HTST) (72°C [161°F] for at least 15 seconds) pasteurized milk or milk products are fed to animals without additional processing. A "*Risk Assessment of Foot-and-Mouth Disease Virus Spread via Pasteurized Dairy Products from cattle in the United States after an FMD Incursion*" was conducted by Dr. Aaron Scott of the USDA in 2003 (unpublished). The conclusion of that risk assessment was that the risk of spreading FMDv by pasteurized dairy products is negligible.

A literature review titled Inactivation of FMD Virus in Milk and Milk Products was completed in 2012 and described the effects of commercial processing of dairy products (pasteurization, homogenization, evaporation, pH changes, drying, and filtration). Refer to that document for specific details on the survivability of FMD virus.

HPAI H5N1

HPAI A(H5N1) can cause severe milk production losses in 10-20% of the lactating herd and in some cows, thickened, colostrum-like milk. Cattle can shed HPAI virus in their milk 1-2 days prior to the onset of clinical signs. Some cattle shed the virus without showing clinical signs. It must be assumed that, in some cases, milk from infected and undetected herds will enter commerce. Research demonstrated that HTST continuous flow pasteurization inactivated HPAI virus[3]. It is safe to drink pasteurized milk and feed it to mammals.

Infectious H5N1 virus could still be found in raw milk from infected cows stored up to 56 days at refrigeration temperatures (4°C or 39.2°F). Research demonstrated that a process called thermization of raw

[2] Donaldson AI, Gibson CF, Oliver R. Infection of cattle by airborne foot-and-mouth disease virus: Minimal doses with O1 and SAT2 strains. *Res Vet Sci;* 1987; 43:339-346.
[3] Spackman E, et.al, Inactivation of Highly Pathogenic Avian Influenza Virus with High-temperature Short Time Continuous Flow Pasteurization and Virus Detection in Bulk Milk Tanks. Journal of Food Protection; 2024;87 (10) doi.org/10.1016/j.jfp.2024.100349

milk at temperatures above 54°C (130ºF) successfully inactivates the virus within 15 minutes.[4] This applies to farms that vat pasteurize milk fed to calves; careful attention to time and temperature is needed to inactivate H5N1 virus.

Raw milk cheeses must be aged for 60 days per the FDA to inactivate bacterial pathogens normally killed through pasteurization. The infectious H5N1 virus survived the 60-day aging process for raw milk cheeses. A study evaluated the effect of decreasing the pH of raw milk prior to aging. The raw milk that was pre-processed with lactic acid and reached a pH of 5.0 inactivated the virus in the cheese curd.[5]

Standards for the Treatment of Raw Milk

Pasteurized Milk Ordinance (PMO)

All U.S. states and territories follow the U.S. Food and Drug Administration (FDA) PMO, which sets the safety standards for milk and milk products for human consumption. One of those standards is that abnormal milk from lactating animals shall be discarded or disposed of and not enter commerce (includes colostrum). The SMS Plan recommendations align with the PMO standards.

World Organization for Animal Health (WOAH)

WOAH sets international sanitary standards related to animal health and zoonoses. The World Trade Organization (WTO) refers to the WOAH standards with respect to the trade of animals and animal products. The WOAH Terrestrial Animal Health Code (TAHC) Chapter 8.8, Infection with Foot and Mouth Disease Virus, 2024 has recommendations based on scientific and technical information for the treatment of milk for inactivation of the FMD virus. See below for specific excerpts from the 2024 version for the treatment of milk and milk products to be imported from FMD infected countries or zones where an official control program exists. In an FMD outbreak, the U.S. will follow the WOAH standards for milk and milk products to be moved out of the Control Area. The SMS Plan recommendations align with the WOAH standards.

Article 8.8.2 Safe Commodities

When authorizing the importation or transit of the following commodities, Veterinary Authorities should not require any type of FMD-related conditions, regardless of the animal health status of the exporting country or zone:

1. Ultra-high temperature (UHT) milk and derivatives thereof

Article 8.8.29 Recommendations for importation of milk and milk products (other than those listed in Article 8.8.2.) from countries or zones infected with FMDV

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that:

1. these products:
    a. originate from herds which at the time of milk collection were not infected or suspected of being infected with FMDV, and comes from milk that:
        - has a pH less than 7 or has been tested for FMDV with negative results, and
        - has been heated at a minimum temperature of 72°C [161ºF] for at least 15 seconds [HTST];

    or

    b. have been processed to ensure the inactivation of FMDV in accordance with one of the procedures in Article 8.8.39.;
2. the necessary precautions were taken after processing to avoid contact of the products with any potential source of FMDV.

[4] Nooruzzaman M, et.al, Thermal inactivation spectrum of influenza A H5N1 virus in raw milk. *Nat Commun* 16, 3299 (2025). https://www.nature.com/articles/s41467-025-58219-1

[5] Nooruzzaman M, et.al, H5N1 influenza virus stability and transmission risk in raw milk and cheese. *Nat Med* **31**, 4265–4273 (2025). https://doi.org/10.1038/s41591-025-04010-0

Article 8.8.39 Procedures for inactivation of FMD virus in milk and milk products

"…One of the following procedures should be used:

1. a process applying a minimum temperature of 72°C [161°F] for at least 15 seconds (high temperature - short time pasteurization [HTST]) applied twice; or
2. any equivalent treatment that has been demonstrated to inactivate FMDV in milk."

Requesting a Secure Food Supply Movement Permit During an Outbreak

Process

Before requesting a Secure Food Supply movement permit:

- Both the premises of origin and the destination need to have a National PIN.
- Ensure the "destination premises is willing to accept the cattle."
  - The destination state must also be willing to accept the cattle and that will be determined through the documentation and permit review steps.

Each premises requesting a movement permit must be registered through the office of their SAHO and/or established as premises in the USDA's Emergency Management Response System (EMRS) before requesting a permit. EMRS is the USDA APHIS official record system for all animal health incidents. For premises following the guidance in the SMS Plan, producers and processors should request permits through the EMRS Customer Permit Gateway or a similar State-approved permitting request system capable of exporting data required for USDA APHIS EMRS during an outbreak, or vice versa. If a State elects to use its own information management system to handle permitting, the information must, in near real-time, be linked to EMRS. This is especially critical for interstate movements where approval of both origin and destination states must be granted, and the Unified Incident Command must be informed.

Further information on Secure Food Supply permits and permitted movements is available in the document FAD PReP Manual 6-0 Permitted Movement. It contains detailed information on the different types of permits and movements, as well as thorough explanations of the permitting process.

Documentation

People requesting movement permits will need to provide the following information (it will be recorded in EMRS):

- Permit class: where you want to move animals or animal products in relation to the Control Area (such as outside of the Control Area).
- Permit reason: why you want to move animals or animal products (such as calves to a calf grower or milk to a processing plant for human consumption – if required).
- Origin premises: location (physical latitude/longitude), including validated National PIN, must be entered in a State information system. For permits issued by EMRS or the EMRS Gateway, the National PIN must be entered into EMRS. (State information systems and EMRS will share data before or during incidents.)
- Destination premises: location (physical latitude/longitude), including validated National PIN, must be entered in a State information system. The destination premises and State needs to agree to the movement. For permits issued by EMRS or the EMRS Gateway, the National PIN must be entered into EMRS. (State information systems and EMRS will share data before or during incidents).
- Item(s) permitted: category of what you are moving (animals, milk, colostrum, feed, manure, etc.).
- Item class: specifically, what you want to move (such as pre-weaned calves to heifer grower).
- Duration/span of permit: first requested movement date, frequency of movements, and over what timeframe movements are expected to occur (such as the beginning date, calves moving daily to calf ranch; throughout the quarantine/end date). The origin State will provide guidance on how long the permit is valid.

Additional documentation may be requested by Regulatory Officials for any permitted movement to aid in decision making and risk analysis. These align with the details in Table 1. Regulatory Officials will advise on how to submit documentation which **may** include:

- Records that provide evidence the origin is NOT a Contact Premises.
- Movement records for animals, vehicles, equipment, and people as applicable
- Evidence of enhanced biosecurity:
  - For movement of **raw milk to commerce**, a written plan that describes how the BPS are being met, and/or a completed copy of the Self-Assessment Checklist for Enhanced Biosecurity, and/or the site-specific enhanced biosecurity plan which includes that information.
  - For movement of **animals and raw milk for animal feed**, a completed copy of the Self-Assessment Checklist for Enhanced Biosecurity and/or the site-specific enhanced biosecurity plan.
  - Written assurance by the producer of compliance with the BPS (raw milk to commerce only) and Enhanced Biosecurity Checklist (animals, animal product movement).
- Evidence that the premises is NOT an Infected or Suspect Premises including one or more of the following:
  - Diagnostic test results are negative for approved samples for the disease of concern.
  - Records show that animals are being monitored for disease by trained cattle health monitors.
  - A Certificate of Veterinary Inspection signed by a USDA Category II Accredited Veterinarian that inspected the animals destined for shipment.
- For animal movements to another production premises, the destination (receiving business entity and the State) must agree to the movement.

Permit Review

Completed movement permit requests will be reviewed first by the Origin State. The permit can be recommended for approval to the Destination State, not recommended for approval to the Destination State, or rejected. If approved by the Origin State, the Destination State reviews, approves, or rejects the permit. The destination premises may also reject a permit. If the permit request is not approved, an explanation for the denial will be provided in the EMRS Gateway. If approved, the producer will receive the approved permit (likely as an electronic PDF) from the official who also informs Unified Incident Command. The permitted movement must comply with all requirements on the permit; all subsequent permitted movements associated with that permit must be submitted to and recorded in EMRS through the permit Gateway or other State-approved data information system for permits.

Acronyms

AOS: Active Observational Surveillance
APHIS: Animal and Plant Health Inspection Service
BGMP: Bovine Germplasm Movement Plan
BPS: Biosecurity Performance Standards
BTM: Bulk tank milk
EMRS: Emergency Management Response System
FAD PReP: Foreign Animal Disease Preparedness and Response (USDA)
FARM: Farmers Assuring Responsible Management, National Dairy Program
FDA: Food and Drug Administration
FMD: Foot and Mouth Disease
FMDV: Foot and Mouth Disease Virus
HPAI: Highly Pathogenic Avian Influenza
HTST: High-Temperature, Short-Time
NADPRP: National Animal Disease Preparedness and Response Program (USDA)
NAHEMS: National Animal Health Emergency Management System (USDA)
NAHLN: National Animal Health Laboratory Network
NMTS: National Milk Testing Strategy
PIN: National Premises Identification Number
PMO: Pasteurized Milk Ordinance (FDA)
rRT-PCR: reverse transcription polymerase chain reaction
SBS: Secure Beef Supply
SMS: Secure Milk Supply
SAHO: State Animal Health Official
TAHC: Terrestrial Animal Health Code of WOAH
UHT: Ultra-High Temperature (pasteurization)
USDA: United States Department of Agriculture
WOAH: World Organization for Animal Health

Glossary

Animal disease traceability: Knowing where diseased and at-risk animals are, where they have been, and when they were there is important to ensure a rapid response when animal disease events occur. (Source: USDA Animal Disease Traceability website, March 2026)

At-Risk Premises: Premises located in the Control Area with susceptible animals, but none have clinical signs compatible with the foreign animal disease. Premises objectively demonstrates that it is not an Infected, Contact, or Suspect Premises. At-Risk Premises are only allowed to move susceptible animals or products within the Control Area by permit. Only At-Risk Premises are eligible to become Monitored Premises. (Source: USDA FMD Response Plan, 2020)

Cattle Health Monitor: People who normally look at the cattle and can recognize when something is "off" – to find early signs of disease. (Source: Surveillance Guidance to Support SMS Plan during an FMD Outbreak, 2018)

Certificate of Veterinary Inspection (CVI): An official document issued by a federal, state, tribal, or accredited veterinarian certifying that the animals identified on the document have been inspected and were found to satisfy the regulations pertaining to their intended movement. A CVI may be required for intrastate, interstate or international movement of animals. Also known as a health certificate or health paper. (Source: American Veterinary Medical Association website)

Colostrum: First "milk" produced for 24 to 48 hours after giving birth. It is nutrient dense, containing immunoglobulins (antibodies) that provide calf immunity after consumption. Per the 2023 PMO, colostrum is considered "Undesirable Milk" and not suitable for sale for Grade "A" purposes. (Source: PMO, 2023)

Commerce: Selling raw milk to processing for human consumption.

Contact Premises: Premises with susceptible animals that may have been exposed to FMD, either directly or indirectly, including but not limited to exposure to animals, animal products, fomites, or people from Infected Premises. (Source: USDA FMD Response Plan, 2020)

Control Area: A designated zone around an Infected Premises to contain and limit the local spread of the virus. It is defined by a minimum radius of 10 km (6.21 miles) from the infected premises and includes a smaller, 3 km radius Infected Zone (IZ) and a 7 km radius Buffer Zone (BZ). Strict quarantines and movement controls are enforced within the CA to prevent the movement of infected animals, products, and contaminated materials. (Source: USDA FMD Response Plan, 2020)

Emerging disease: A new animal disease, infection, or infestation that has a significant impact on animal or public health. This can be due to a change in a known pathogen, its spread to a new geographic area or species, or the diagnosis of a previously unrecognized one. (Source: WOAH)

Enhanced biosecurity: Heightened measures on a site designed to protect livestock from highly contagious diseases during an outbreak.

Infected Premises: Premises where presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, FMD case definition, and international standards. (Source: USDA FMD Response Plan, 2020)

Monitored Premises: Premises located in the Control Area that objectively demonstrates it is not an Infected, Contact, or Suspect Premises. Only At-Risk Premises are eligible to become Monitored Premises. Monitored Premises meet a set of defined criteria in seeking to move susceptible animals or products out of the Control Area by permit. (Source: USDA FMD Response Plan, 2020)

Movement restrictions: A general term to encompass the language and implementation differences for animal and animal products among federal movement recommendations and individual state plans.

Raw milk: Milk from lactating dairy cattle that has not been pasteurized. (Source: PMO, 2023)

Regulatory Officials (local, state, tribal and federal officials): A person who is authorized to enforce laws protecting agricultural health and managing disease outbreaks. (Sources: multiple)

Secure Food Supply movement permit: Used for movements of animals and animal products into the supply chain for feeding, growing, processing, or to market to facilitate continuity of business for non-infected premises inside a Control Area. (Source: USDA Foreign Animal Disease (FAD) Response Ready Reference Guide—Defining Permitted Movement, 2017)

Suspect Premises: Premises under investigation due to the presence of susceptible animals reported to have clinical signs compatible with FMD. This is intended to be a short-term premises designation. (Source: USDA FMD Response Plan, 2020)

Thermization (heat treated): Raw milk that undergoes a low heat treatment typically between 57°C and 68°C (135°F to 154°F) for 15 to 20 seconds. It is a pre-treatment step for raw milk that will be stored for extended periods of time to reduce the number of spoilage bacteria while preserving quality. It does not eliminate pathogens like pasteurization and the PMO considers it raw from a regulatory standpoint. The dairy industry uses thermization to prepare milk for further processing like pasteurization or making aged cheeses. (Source: PMO, 2023 and Raw, Thermized, or Pasteurized Milk for Cheesemaking, Formaggio Kitchen, 2016)

Unified Incident Command: A structured approach to managing incidents involving multiple jurisdictions or agencies. The Unified Command is responsible for overall management of the incident and works collaboratively to develop common incident objectives and strategies, share information, and maximize resource use. The Unified Command structure is flexible and can accommodate changes as the incident progresses, ensuring an integrated response team. (Source: USDA ICS 300)

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Comments

Please send comments or suggested edits for improvement to: smsinfo@iastate.edu

Additional Resources

The Secure Milk Supply website has additional resources available at: www.securemilk.org

Appendix A: SMS Plan Movement Permit Guidance Criteria for Dairy Farms Located within an FMD Control Area

Item to Permit	Risk assessment for movement is:	Traceability (PIN, records) info is available (Not Contact Premises):	And SMS Enhanced Biosecurity Checklist in place, acceptable?	And SMS BPS are in place?	And production parameters normal; records acceptable (Not Infected or Suspect Premises)?	Bulk Tank Milk (BTM) test negative (Not Infected Premises)?	Standards to meet:	Permit Guidance to Move Item:
Raw milk to commerce from an At-Risk or Monitored Premises	Negligible to moderate[6]	YES	N/A	YES	YES	Yes, if available	PMO[7]	Issue permit to move to specific location
Raw colostrum to commerce from an At-Risk or Monitored Premises	Unknown	YES	N/A	?	YES	YES	None	?
Raw milk/ colostrum to an animal facility from an At-Risk or Monitored Premises	Unknown	YES	YES	N/A	YES	Yes, if available	WOAH[8] to inactivate FMD virus	Issue permit to move to specific location

[6] Johnson, Kristen; Malladi, Sasidhar; Lee, James; Easter Strayer, Sarah; LoSapio, Carol; Hunt, Aimee; Umber, Jamie; Goldsmith, Timothy. (2016). Risk Assessment for the Transmission of Foot-and-Mouth Disease via the Transport of Raw Milk Into, Within, and Outside of a Control Area during an Outbreak with Implementation of the Biosecurity Performance Standards (RA-BPS Analysis). Retrieved from the University Digital Conservancy, https://hdl.handle.net/11299/178987.
[7] FDA Grade "A" Pasteurized Milk Ordinance, Revision 2023, https://ncims.org/wp-content/uploads/2024/08/2023-pmo.pdf
[8] World Organization for Animal Health, Terrestrial Animal Health Code Chapter 8.8 Infection with FMD, Article 8.8.39 Procedures for inactivation of FMD virus in milk and milk products

Item to Permit	Risk assessment for movement is:	Traceability (PIN, records) info is available (Not Contact Premises):	And SMS Enhanced Biosecurity Checklist in place, acceptable?	And SMS BPS are in place?	And production parameters normal; records acceptable (Not Infected or Suspect Premises)?	Bulk Tank Milk (BTM) test negative (Not Infected Premises)?	Standards to meet:	Permit Guidance to Move Item:
Raw milk from a Control Area received at a milk plant and rejected for human consumption	Negligible to moderate[5]	YES	N/A	YES	YES	N/A	WOAH[7] to inactivate FMD virus	Move to location that can Inactivate potential virus (alkaline digester or other process)
Expired grocery store dairy product returns destined for animal feed	Unknown	YES	N/A	N/A	N/A	N/A	WOAH[7]to inactivate FMD virus	Issue permit to move to specific location
Cattle	Unknown	YES	YES	N/A	YES	Yes, if available	Destination premises and state are willing to accept the cattle	Issue permit to move to specific location

Criteria for bovine germplasm (semen, embryos, oocytes) and high genomic merit animals is described in the Bovine Germplasm Movement Plan (BGMP).