

# Secure Milk Supply Plan: Enhanced Biosecurity for H5N1

The Secure Milk Supply (SMS) Plan [Enhanced Biosecurity](#) resources were written based on foot-and-mouth disease (FMD) prevention. Both FMD and H5N1 are contagious viruses shed by cattle in raw milk and other bodily fluids. That is why the enhanced biosecurity steps for FMD are being recommended by USDA to protect cattle from H5N1. A chart of similarities and differences between FMD and H5N1 is in Appendix A.

There are 11 points in the [SMS Self-Assessment Checklist](#) for Enhanced Biosecurity for FMD Prevention. Each is listed below with examples for preventing H5N1 exposure based on what is currently known. Guidance is subject to change as more information is learned.

The NMPF Farmers Assuring Responsible Management (FARM) Program provides [free online training](#) to learn how to develop an SMS enhanced biosecurity plan. More information is available in the free [Enhanced Biosecurity Plan Prep Guide](#).

1. Dairies are encouraged to appoint a Biosecurity Manager, someone familiar with the operation to:

- Monitor the changing situation,
- Work closely with their herd veterinarian to develop and set up an operation-specific biosecurity plan for susceptible species,
- Ensure biosecurity steps are put in place, and
- Serve as a point of contact in case of infection.

2. The Biosecurity Manager should train essential personnel on biosecurity steps needed to keep H5N1 out of the herd and to protect themselves from possible exposure if animals become sick.

- Resources for training and more are listed in Appendix B.

3. Protect the dairy from exposure by:

- Setting up a Line of Separation (LOS) that

physically separates off-farm and on-farm (business critical) movements. Think of this as the “moat” around animals, their areas, and feed that need to be protected.

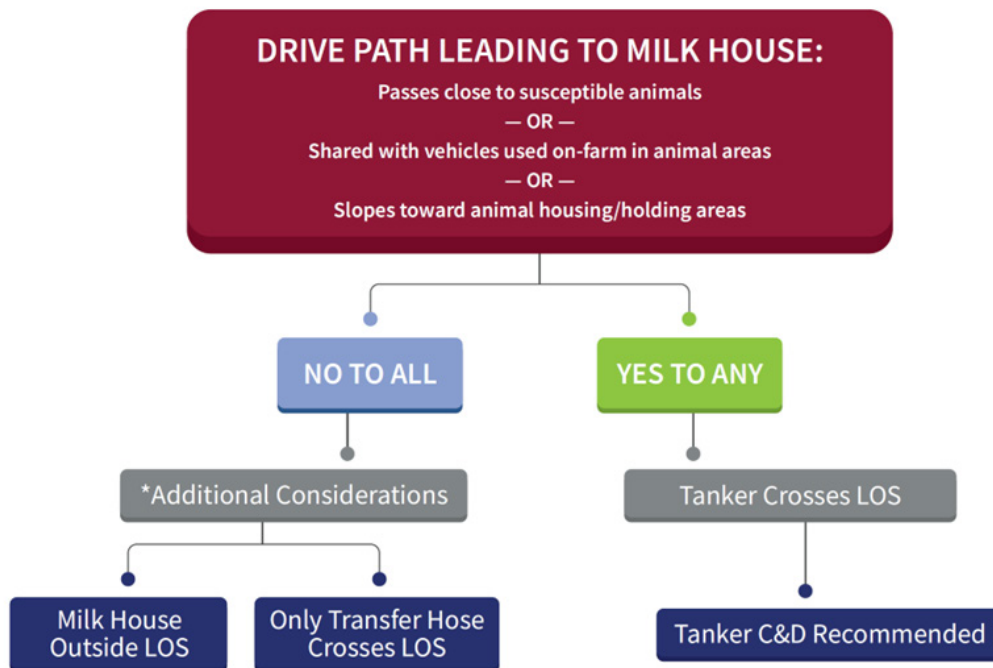
- Using the SMS/FARM “[Dairy Operation Inputs/Outputs Worksheet](#)” can help determine the most practical LOS placement to protect cattle.
- Limit entry to the dairy through controlled access points. Think of these as the “drawbridges” to cross the LOS (moat). Vehicles, equipment, and people that cross need to follow specific biosecurity steps and fill out an entry log.
- Setting up Cleaning and Disinfection (C&D) Station(s) at each vehicle/equipment access

point. Ensuring people are trained to properly clean items to remove debris and use an EPA-registered disinfectant to kill avian influenza virus, manage effluent and protect themselves from disinfectant contact.

- Having a parking area for non-essential vehicles outside the LOS, away from animal areas.

## DETERMINING THE LOS LOCATION

While specific to the milk truck, the same principles apply to any vehicle or equipment (livestock truck, rendering, feed delivery, etc.) that may need to cross the LOS. See below for a figure from the [FARM Biosecurity Prep Guide](#) that includes \*additional considerations.



4. Clean and disinfect essential vehicles and equipment that need to cross the LOS before entry. This includes tires, undercarriage, wheel wells, inside livestock trailers, on chutes, treatment equipment and truck-mounted milk transfer hoses.

- Modify drive paths to keep hard-to-clean vehicles, equipment and items outside the LOS. Make C&D the exception, not the rule to save labor, water, and disinfectant resources for business-critical movements.
- Inspect items used on other livestock.
- Limit the use of trailers to hauling your own cattle when possible.
- Shared trailers should have their interiors cleaned and disinfected prior to loading cattle unless going directly to slaughter and staying outside the LOS.

5. Limit personnel crossing the LOS to those essential for cattle health and continued dairy operation.

- Delay or stop non-essential visitors.
- Require personnel transporting livestock to follow the steps in the Secure Beef Supply resource: [Livestock Hauler/Transporter Enhanced Biosecurity Steps for FMD Protection](#)

- Prior to arriving at the dairy, everyone crossing the LOS that will contact cattle should arrive having showered, wearing clean clothing, footwear, and personal items since last contacting animals (live or dead), their areas or raw milk. The inside of their vehicle should be clean and have no visible contamination (soiled clothes, footwear, or other items) that could transfer to their clean clothing, clean footwear, and exposed skin.
  - Record entry of personnel and keep work schedule records for employees.
  - Follow a Biosecure Entry Procedure when crossing the LOS:
    - Wear dairy-dedicated or clean disposable/disinfectable footwear.
    - Wash hands and wear disposable or disinfectable gloves over clean hands.
    - Protective eyewear if milking cows or handling disinfectants.
    - All animal handlers must also put on dairy-dedicated clothing or put on clean coveralls/protective outerwear.
  - Follow a Biosecure Exit Procedure when leaving the LOS:
    - Remove any protective outerwear and disposable footwear.
    - Clean and disinfect footwear/eye protection or leave on the dairy.
    - Remove gloves and wash hands.
    - Leave soiled clothes or coveralls on the dairy to be laundered or place in a garbage bag/tote that can be closed and stored until they can be laundered/cleaned off-site.

## ANIMAL MOVEMENT

- Delay or stop incoming or returning animals from herds with unknown or suspect health status. Follow state and federal pre-movement testing requirements.
- Follow strict biosecurity for cattle during and after exhibitions.
- Record entry of animal movements.
- Follow an isolation period protocol for animals

that must be introduced.

- Separate all new or returning animals for at least 30 days. Per USDA, the herd level incubation period in dairy cattle appears variable, from 12 to 21 days.
- Monitor health status at least daily.
- Avoid continual introductions. Keep this group “closed” until they are ready to join the main herd.
- Work with your veterinarian to determine testing, vaccination for endemic diseases and other health needs.
- Dedicate caretakers and equipment to these animals or work with them last.
- Use dedicated clothing, footwear, protective eyewear, and equipment or wash/dry or clean and disinfect before wearing/using around other animals. Encourage handwashing and/or the use of gloves on clean hands.
- Milk this group after the resident herd. Follow milk system sanitation steps before milking other groups of animals.
- Load/unload animals at the perimeter of the LOS if possible.
- See “vehicles and equipment” for more details on livestock trailers that cross the LOS.

## ANIMAL PRODUCT MOVEMENT

Animal product movement for H5N1 prevention focuses on raw milk and dairy products fed to calves and adult cattle as feed.

- Collect milk following a farm-specific standard operating procedure (SOP) that meets or exceeds the SMS Plan [Biosecurity Performance Standards for Raw Milk Collection and Transport](#).
- Describe in your biosecurity plan the drive path to the milk house, whether the milk truck crosses the LOS or not, the use of single or commingled tankers on this operation, if direct load tankers are used on other farms, the type of milk transfer hose used (truck mounted or farm-dedicated), and whether the milk hauler/driver exits the cab to load milk.

- Do not allow milk haulers to contact farm personnel, animal housing, animals or milk products to be fed to calves.
- Wash down and disinfect areas within the LOS where raw milk from other operations leaked or was spilled to prevent tracking into animal areas.
- Feed only heat-treated colostrum and pasteurized milk and milk products to calves, adult dairy cattle and other mammals.
  - The effect of acidification on milk to inactivate H5N1 is unknown.
  - There is a potential risk of feeding unpasteurized dairy products and milk components to adult cattle. Studies are needed to determine transmissibility risk.
- A milk disposal plan exists in the event raw milk cannot be moved to processing off-farm.
  - Dispose of raw milk in a manner that meets local, state and federal regulations and prevents exposure to other animals.
  - Heat treatment or pasteurization of milk from sick cows inactivates H5N1 and other harmful bacteria.
  - Do not allow raw milk consumption by humans or animals.
- Semen and embryos have not been linked in the spread of H5N1 to date.
  - Data on H5N1 presence and survival in oocytes, embryos and semen is not currently available.

## CARCASS DISPOSAL

Carcass disposal should prevent the attraction of scavengers.

- Cover compost piles whenever possible.
- Keep rendering trucks and other vehicles hauling dead animals to a common disposal site outside the LOS.

## MANURE MANAGEMENT

Manure management equipment shared between operations may pose a risk of spreading H5N1.

- Data on H5N1 presence and survival in cattle manure and lagoons is not currently available.

## WILDLIFE, OTHER ANIMAL CONTROL

Rodent, wildlife and other animal control should focus on small mammals and birds as they may be early indicators of H5N1 on a dairy. Some species may be reservoirs (shed the virus) or fomites (carry virus on fur, foot pads, feathers).

- Report findings of odd behaviors or increased numbers of dead wild birds, cats, skunks or raccoons to animal health officials.
  - Small mammals (cats, skunks, raccoons) have died from exposure to this strain of H5N1. Mice fed H5N1 infected milk also died. Their role in direct spread to cattle is currently unknown.
  - Prevent cats from roaming between farms.
  - Avoid feeding raw milk to cats.
  - Ensure there is an effective rodent control plan on the dairy.
- Disrupt habitats like shelter, food, and water sources that may attract birds and small mammals (cats, skunks, raccoons).
  - Follow state and federal regulations. Complete elimination is difficult.
  - Contact U.S. Fish and Wildlife Service, USDA Wildlife Services, state agriculture or natural resources department for guidance on managing birds.
- Bird management
  - Non-lethal methods like harassment, hazing, and removing empty nests are options for bird control.
  - Consider using decoys or scare devices in common roosting areas; move/change so birds do not get used to them.
  - Consider using perch deterrents like spikes on rafters.
  - Fence off ponds/non-draining areas. Consult a wildlife or wetlands professional about managing ponds and drainage areas on farm.

## FEED

Feed can attract wildlife, birds, and other animals. Disrupt habitats as described above.

- Data on H5N1 presence and survival in feed is not currently available.

## MONITORING FOR SICK ANIMALS

If sick animals are found that fit the H5N1 clinical case\* definition, contact your herd veterinarian for testing and management advice. Once H5N1 is introduced to a dairy, stopping spread has not been possible to date based on several management factors and the contagious nature of this virus. Raw milk from clinical animals should not enter the food supply. It should be heat treated prior to disposal. USDA will pay producers up to \$2,000 per affected premises per month towards heat treatment. More information about financial support options is available on the [USDA HPAI in livestock website](#).

\*[USDA Case Definition](#) (May 2024): Infected cattle can shed virus before showing clinical signs which may include a decrease in feed consumption and decrease in rumination and rumen motility; respiratory signs including clear nasal discharge; and acute drop in milk production. Additional clinical signs may include abnormal tacky or loose feces, lethargy, dehydration, and fever. Severely affected cattle may have thicker, concentrated, colostrum-like milk or produce no milk at all.

## PRECAUTIONS FOR ANIMAL CARETAKERS

The CDC states the current risk of H5N1 infection to the public is low. People working closely with infected or presumed infected animals are at greater risk of infection. This is due to close contact with the infectious virus in raw milk or other bodily fluids (possibly urine) from infected cattle. Federal and state health agencies are closely monitoring for changes that might indicate the potential for increased transmission of the virus to humans or among humans.

According to CDC's [interim recommendations](#), people should avoid unprotected exposures to sick or dead animals, as well as raw milk, manure or materials contaminated by animals with confirmed or suspected H5N1 virus infection.

When working with infected or potentially infected animals, farm employees should wear [personal protective equipment](#). Information for farm workers exposed to H5N1 is available in [English](#) and [Spanish](#).

Most milkers are accustomed to wearing boots, gloves and eye protection for other reasons before this outbreak. Protecting the eyes, nose, and mouth from splashes or touching with contaminated hands/gloves should be a primary focus. Goggles or a face shield should be worn. N95 masks can protect the nose and mouth. Workers wearing additional protection will require extra monitoring for heat exhaustion if barriers like waterproof coveralls and aprons are added.

Animal handlers are encouraged to thoroughly wash their hands after contact with infected animals, carcasses, milk or manure. Persons working with or around cattle, even if not in close contact, should avoid eating, drinking, smoking, chewing gum and other such activities in potentially contaminated areas (parlor, hospital pen, holding pen, areas where milk or urine may splash). They should also avoid rubbing or touching their eyes and should thoroughly wash their hands often.

Anyone exposed to infected cattle should be monitored for signs and symptoms of acute respiratory illness or conjunctivitis beginning after their first exposure and for 10 days after their last exposure. If any person develops acute respiratory illness symptoms during the monitoring period, the state health department should be notified, and the sick person should be isolated.

CDC, USDA, and FDA remind animal caretakers and consumers not to prepare or eat uncooked or undercooked food or related uncooked food products, such as unpasteurized (raw) milk or fresh raw milk cheeses, from animals with suspected or confirmed H5N1 cases.

## MORE INFORMATION ABOUT BIOSECURITY FOR H5N1 IN DAIRY CATTLE

- [Dairy Cattle: Biosecurity for H5N1 Virus](#)
- [Spread and Prevention of H5N1 Virus in Dairy Cattle](#)

## ACKNOWLEDGEMENTS

This resource was created by NMPF and Preventalytics based on USDA, CDC and FDA recommendations, enhanced biosecurity resources in the SMS Plan, published and pre-print research, and USDA epidemiological reports. It was reviewed by the American Association of Bovine Practitioners Working Group consisting of veterinarians working with dairy clients with clinical cases, diagnosticians, academicians, industry representatives, preventive medicine specialists, epidemiologists, biosecurity subject matter experts, NMPF, National Cattlemen's Beef Association and the American Veterinary Medical Association.



**VISIT [WWW.NMPF.ORG/HPAI](http://WWW.NMPF.ORG/HPAI) FOR A  
FULL LIST OF AVAILABLE RESOURCES  
AND UP-TO-DATE INFORMATION.**



## APPENDIX A: FMD AND HPAI H5N1 VIRUS SIMILARITIES AND DIFFERENCES

VIRUS	SHED BY CATTLE IN	EXPOSE NEW CATTLE THROUGH	SIGNS IN CATTLE
FMD	<ul style="list-style-type: none"> <li>• Milk</li> <li>• Urine</li> <li>• Nasal secretions</li> <li>• Saliva</li> <li>• Feces</li> <li>• Semen</li> </ul>	<ul style="list-style-type: none"> <li>• Direct contact (includes reproductive spread)</li> <li>• Fomites (contaminated inanimate objects)</li> <li>• Inhalation (aerosol)</li> <li>• Oral</li> </ul>	<ul style="list-style-type: none"> <li>• Blisters on teats, feet, in mouth leading to: <ul style="list-style-type: none"> <li>• Decreased feed intake</li> <li>• Nasal discharge</li> <li>• Decreased milk production</li> <li>• Lameness</li> <li>• Mastitis</li> </ul> </li> <li>• Fever (103-106°F)</li> <li>• Calf death</li> </ul>
H5N1	<ul style="list-style-type: none"> <li>• Milk</li> <li>• Rarely nasal secretions, urine, saliva.</li> <li>• Not found in feces.</li> <li>• Data on H5N1 presence and survival in semen is not currently available.</li> </ul>	<ul style="list-style-type: none"> <li>• Intramammary</li> <li>• Direct contact*</li> <li>• Fomites</li> <li>• Inhalation (aerosol)*</li> <li>• Oral*</li> </ul> <p>*Research needed to fully understand exposure</p>	<ul style="list-style-type: none"> <li>• Decreased feed intake <ul style="list-style-type: none"> <li>• Decreased rumination</li> </ul> </li> <li>• Respiratory signs <ul style="list-style-type: none"> <li>• Clear nasal discharge</li> </ul> </li> <li>• Decreased milk production <ul style="list-style-type: none"> <li>• Thick, yellow, colostrum-like to no milk</li> </ul> </li> <li>• Abnormal feces</li> <li>• Lethargy</li> <li>• Dehydration</li> <li>• Fever</li> <li>• Youngstock do not show clinical signs and it is rare to find virus on nasal swabs</li> </ul>

## APPENDIX B: TRAINING RESOURCES AND SUPPORT MATERIALS TO IMPLEMENT ENHANCED BIOSECURITY FOR H5N1

Below are resources that apply to keeping H5N1 out of a dairy herd. Most come from the SMS website: [www.securemilk.org](http://www.securemilk.org) and are applicable to this disease situation.

Line of Separation, Access Points

- [Dairy Operation Inputs/Outputs Worksheet](#)
- [Establishing LOS & Controlled Access Point SOP](#)

Signs to mark the LOS and access points

- Do Not Enter – Cross only at Biosecure Entry Point: [English and Spanish](#)
- Biosecure Entry Ahead: [English](#) and [Spanish](#)
- Stop – Biosecure Entry Ahead: [English](#) and [Spanish](#)

Forms to log people, animal, and vehicle/equipment entry and deliveries available at:

- [Animal Movement Log](#)
- [People Entry Log](#)
- [Vehicle/Equipment Movement Log](#)
- [Employee and Visitor Arrival Agreement](#)

## **Cleaning and Disinfection Station**

Setting Up and Operating a Temporary C&D Station, Iowa Department of Agriculture and Land Stewardship (IDALS) and Iowa State University (ISU) [Watch](#) (16 min) | [handout](#)

- Supply List for Temporary C&D Station, IDALS, ISU [handout](#)
- Resources for Establishing C&D Station, IDALS, ISU [handout](#)
- Preparing the C&D site, disinfection selection, University of California, Davis: [Watch](#) (9:23 mins)
- Milk Tanker Exterior C&D, Rutgers University: [Watch](#) (5:48 mins)
- [Cleaning and Disinfection SOP](#)
- [EPA-registered disinfectants for avian influenza](#)

Resources for trailer interior C&D are available from the swine industry:

- [Livestock Truck Wash](#)
- [Tips for Cleaning Out Livestock Trailers](#)

## **Personnel**

- [Personnel Entry/Exit SOP](#)
- Secure Beef Supply: [Livestock Hauler/Transporter Enhanced Biosecurity Steps for FMD Protection](#)
- Center for Food Security and Public Health (CFSPH) Footwear Tip Sheet: [English](#) and [Spanish](#)
- CFSPH Laundry Tip Sheet: [English](#) and [Spanish](#)

## **Animal Movement**

- [Recommendations to Minimize Influenza Transmission at Dairy Cattle Livestock Exhibitions](#)

## **Animal Product Movement**

- [SMS Plan Biosecurity Performance Standards for Raw Milk Collection and Transport](#)
- [Milk Collection SOP – Hauler/Truck Do NOT Cross LOS](#)
- [Milk Collection SOP – Hauler/Truck Cross LOS](#)
- Milk Collection Signs
  - Wear PPE – Clean and Disinfect: [English](#) and [Spanish](#)
  - Do Not Enter – Milk Collection Occurring: [English](#) and [Spanish](#)
  - Entry Permitted – Cleaning and Disinfection Complete: [English](#) and [Spanish](#)

## **Bird Control**

- [USDA wild bird management resources](#)