

# PREVENTION PRACTICES FOR FOOT-AND-MOUTH DISEASE (FMD)

If a case of foot and mouth disease (FMD) is confirmed anywhere in the United States, it could spread rapidly across the nation. If any animal on your farm is confirmed to have FMD, all animals on the farm that could get sick (cattle, swine, sheep and goats) may be euthanized and disposed of to control the further spread of the disease.

There are steps you can take to help prevent FMD from entering your farm. **Strict biosecurity practices** can help you and your neighbors **minimize the chances** that your animals will have to be destroyed.

A General Precautions handout (found on the CFSPH website) provides prevention steps that should always be used on a farm.

The biosecurity practices outlined here should be put into place **immediately** if FMD is confirmed anywhere in the U.S. and maintained until the U.S. is once again declared FMD free.

## General Precautionary Measures

Prevention measures to minimize the introduction and spread of FMD onto your farm fall into three general categories.

1. Use strict biosecurity measures for animals, animal products, vehicles, people and equipment.
2. Restrict or stop all animal movement to prevent entry or spread of the disease.
3. Observe, detect and report any disease or unusual signs to your herd veterinarian as quickly as possible.

Specific steps you can take upon FMD being confirmed in the United States are listed below. Many should already be in place on your farm but should be enhanced and more strictly enforced in the event that FMD is confirmed in the U.S. This will minimize the chance of the disease being introduced onto your farm.

## Farm Entrance

- **Limit access to your farm.**
  - The entrance to your farm is a major control point.
  - Have only one gated entrance to the animal areas on your farm to better control and monitor all visitors and vehicles arriving at your farm.
  - Keep the gate locked when not in use.
- **Stop all movement of animals on and off your farm.**
  - If FMD is confirmed in the U.S., movement restrictions may be implemented locally, regionally and possibly nationally.

- Restrictions will depend on the scope of the outbreak.
- These measures will minimize the spread of FMD to other areas, including your farm.
- **Post signs at the farm entrance to inform visitors of procedures to follow on your farm. (See Appendix A)**
  - Stay off this farm unless given permission to enter.
  - Honk before getting out of vehicle (to announce your arrival).
  - Check-in with farm personnel upon arrival. (Direct visitor to "where" they should check-in).
  - Follow farm biosecurity procedures.
  - Wear protective clothing (coveralls, boots) while on the farm. (Be sure to guide visitors to where protective clothing is located).
  - Visitors and their vehicles should avoid contact with animals, unless absolutely necessary.
- **Traffic on or off your farm should be closely monitored and recorded. (See Appendix B)**
  - Maintain a log sheet to record all visitors and vehicles that enter your farm.
  - All visitors should be accompanied by someone from your farm at all times.
  - Accurate record keeping of traffic on your farm will help with disease surveillance and tracking should it become necessary.
  - Do not rely on your ability to "recall" visitors and vehicles that were on your farm.

## People

### Employees

- **Limit employees to only those necessary for the continued operation of the farm.**
  - Minimize contact with animals to only tasks necessary for the continued operation of the farm and health and well-being of the animals.
- **Implement strict biosecurity measures for employees coming onto the farm.**
  - Provide clean boots, hats and coveralls to wear on the farm. These items should remain on your farm when the person leaves and be washed and disinfected before they are used again.
  - All footwear should be disinfected before entering AND after leaving any animal housing area.
  - Hands must be washed with soap and warm water before entering AND after leaving an animal housing area.

# PREVENTION PRACTICES FOR FMD (CONT'D)



- **Employees that have contact with livestock at other locations (including their own home) should use strict biosecurity measures while on your farm.**
- **Educate yourself and train your employees about FMD and the signs of illness. (Photos found in Appendix C)**
  - Blistering or ulcers on the mouth, tongue, feet or teats
  - Increased salivation or slobbering
  - Refusal to eat
  - Signs of lameness
  - Refusal to walk or move
- **Contact the herd veterinarian immediately if unusual illness or signs are noticed.**

## Neighbors

- **Discuss the threat of FMD with your neighbors.**
- **Determine steps you can take together to protect your area and farms from becoming infected.**
  - Eliminate direct contact between animals across fence lines.
  - Control free roaming animals, especially dogs and cats.
  - Do not share equipment or vehicles between farms.
  - Always wear clean coats, coveralls, boots, hats, etc. when coming in contact with animals.
  - Change gloves, clothes, hats and wash and disinfect boots between farms.
  - Wash your hands thoroughly after any contact with animals.

## Visitors

- **Post warning signs asking visitors to keep out. (See Appendix A)**
- **Minimize visitors to only those necessary for the continued operation of the farm.**
  - FMD is highly contagious and the virus could be carried onto your farm by people's clothing or on vehicle tires and wheel wells.
- **Visitors should park at the entrance to the farm away from animal areas or in designated parking areas.**
- **Only on-farm vehicles should be used.**
- **Specific rules and biosecurity measures to follow on farm should be clearly posted for visitors.**
- **Record any visitors onto the farm with a log sheet.**

- **Provide the following items for visitors:**
  - Clean coveralls, hats and disposable or disinfected rubber boots.
  - Facilities for disinfecting vehicles, footwear and clothing.
  - Pressure washers, brushes, hoses, water and EPA approved disinfectants for disinfection of footwear and any equipment used. (See Appendix D for disinfectants to use for FMD).
- **All visitors should be accompanied by someone from the farm at all times.**
- **Visitors should avoid livestock areas, pens and barns unless absolutely necessary.**
- **Restrict close contact or handling of animals by visitors (unless necessary for the health of the animal).**
- **If your livestock business depends on visitors, such as petting farms, or international and local visitors for sales promotion,**
  - Ensure that they have not been to areas where FMD has recently occurred.
  - Visitors from these areas should not be allowed access until they have been away from affected areas for at least five days and follow ALL the above protocols.

## Vehicles

- **Minimize traffic to only that essential for the continued operation of your farm.**
  - FMD is highly contagious and the virus could be carried onto your farm by people's clothing or on vehicle tires and wheel wells.
- **Do not allow off-farm vehicles to drive onto your farm; they should be parked at the entrance or in designated parking areas and use on-farm vehicles.**
- **Have deliveries left at the farm entrance.**
- **Any vehicles entering the farm must have their wheels, wheel wells and under carriage sprayed with disinfectant prior to entry and again upon leaving.**
  - Provide facilities for washing and disinfecting vehicles before they enter the farm.
- **Record any vehicles entering the farm with a log sheet.**
  - Maintain accurate record keeping of traffic onto and off of your farm to help with surveillance and tracking should it become necessary.

# PREVENTION PRACTICES FOR FMD (CONT'D)



- Do not rely on your ability to “recall” visitors and vehicles that have accessed your farm.
- **Restrict areas where vehicle traffic can go.**
  - Establish parking areas away from any animals, barns and livestock areas, preferably on concrete or paved areas.
  - Avoid vehicle transfer of dirt, mud or manure.
- **Stop all movement of animals on and off farm.**
  - In the event of FMD in the U.S., movement restrictions will likely be ordered.
  - This serves to not only minimize the spread of FMD but may prevent it from getting onto your farm.
- **If you are allowed to move animals, clean and disinfect the vehicle and trailer before loading and after unloading.**
  - Pay special attention to the tires and wheel wells.
  - Do not mix livestock species in vehicles when transporting animals.
- **Monitor animals closely and frequently for any developing illness or signs of disease.**
- **Isolate sick animals from the herd to minimize disease spread.**
  - Isolation should be at a minimum 28-30 days (which equals two incubation periods for FMD).
- **Contact your herd veterinarian immediately to examine sick animals.**
- **Use separate facilities, equipment and staff to handle isolated livestock.**
  - If this is not possible, at a minimum, handle or visit the isolated animals LAST.
  - Clean and disinfect all equipment, clothing, boots, etc. that come into contact with ill animals.
- **Do not acquire semen from FMD-outbreak areas.**
  - Semen can contain large amounts of the FMD virus.
- **Any animals that have recently been purchased or have returned to the farm should be quarantined for 30 days.**
  - New or returning animals (e.g. shows, competitions) can be infected with a disease without showing signs right away.
  - Quarantine allows time for a disease to develop in the animal, without exposing your entire herd to the disease agent. The animal can then be examined, diagnosed and treated (if it is not FMD).
  - Animals exposed to the FMD virus can take as long as 14 days before signs of illness are seen.
  - Do not allow new additions and animals returning to share water, feed, facilities or bedding with your other animals.
  - Ideally, animals should be quarantined at a separate location (premises).

## Record Keeping

- **Maintain thorough and accurate records of animal movement.**
  - Document all prior animal movements, including the dates of introduction into the herd, where they came from and movements between separate units.
  - Each farm location must be treated as a separate unit or premise.
  - This information will be essential to help trace where the disease came from.
- **Know the health status and the source of any animal(s) brought onto your farm.**
  - Do not bring animals onto your farm unless they have been proven to be from FMD-free areas.

## Animals

### Livestock

- **Do not allow contact of your animals with neighbor's livestock.**
  - Move animals out of pastures or lots where they have contact with neighboring animals.
  - Provide as much distance between your animals and neighboring animals as possible.
  - Consider double fencing the perimeters to minimize nose-to-nose contact.
- **Fence off streams and rivers.**
  - Provide fresh drinking water in tanks.

### Wildlife and Other Animals (See Appendix E)

- **Prevent contact with free roaming animals (wildlife, cats, dogs).**
  - Free roaming animals can potentially spread the FMD virus from infected to susceptible animals.
  - Keep pets in a kennel or tied securely to avoid contact with livestock and feed areas.
  - Ask your neighbors to do the same.
- **Control of wildlife will be difficult, but should be attempted.**
  - Keep farm access routes, parking areas, yards and storage areas clean and tidy to avoid attraction of birds or rodents.
  - Implement rodent and vermin control measures to minimize the potential spread of disease by these animals.

# PREVENTION PRACTICES FOR FMD (CONT'D)



## Cleaning and Disinfection (See Appendix D)

### General

- **Remove any organic material before any cleaning or disinfection.**
  - Most disinfectants are ineffective when dirt, manure and other debris are present.
  - This step applies to boots and vehicles as well as buildings being cleaned.
- **Use the proper concentration of disinfectant (see the product label).**
- **Allow the disinfection solution to “sit” (contact time) and work, according to the product label (usually at least 5 minutes).**
  - Disinfectants need time to work and kill the microorganisms present.

### People

- **Provide clean protective clothing and footwear for visitors.**
- **Require that they wear these items if entering livestock areas.**
- **Wash hands with soap and warm water before entering AND after leaving an animal housing area.**
- **Provide boot baths at the entrance/exit of animal areas.**
- **Visitors must remove and leave behind protective outer clothing and footwear when leaving the farm.**

### Boot Baths

- **Anyone allowed in animal areas should be required to wash and disinfect their boots prior to entering and when exiting animal areas.**
- **Maintain boot baths properly.**
  - Mix solution to the proper concentration according to the label instructions.
  - Clean all dirt, manure and debris off of boots **BEFORE** stepping into the disinfectant solution. Organic material (dirt, manure, etc) will prevent most disinfectants from working.
  - Allow the disinfectant solution to have ample contact time with the boot surface. This will vary with the disinfectant selected. Consult the product label.
  - Change solutions daily or when visibly dirty.

## Barns and Buildings

- **Clean and disinfect anything that has come in contact with manure or animal secretions before it is used for another purpose.**
- **Clean isolation areas and replace bedding regularly. Surfaces should be scraped, cleaned with high pressure hot water and detergent, and rinsed. Disinfectant should then be applied and allowed to “sit” for the optimal contact time (see product label).**
- **Dispose of bedding and manure from isolation areas and store it in a fenced off area, making sure livestock or wildlife do not have access to it.**

## Vehicles

- **Any vehicles (trucks, trailers, etc.) allowed on the farm have the potential to spread disease. Therefore, cleaning and disinfection of vehicles is important.**
  - Tires and wheel wells are especially important.
- **Have facilities and equipment available for disinfecting vehicles.**
  - Have pressure washers, brushes, hoses, water and EPA approved disinfectants (see Appendix D) available.

## References

- Bovine Alliance on Management and Nutrition. Handling foreign animal diseases in cattle. BAMN Publication. 2005
- Department for Environment, Food and Rural Affairs (DEFRA-UK). Biosecurity guidance to prevent the spread of animal diseases. Accessed on July 06, 2005 at <http://www.defra.gov.uk/animalh/diseases/pdf/biosecurity-guidance.pdf>
- Montana Department of Livestock. Prevention and control – Foot and mouth disease. Accessed on June 21, 2005 at <http://www.discoveringmontana.com/liv/animalhealth/diseases/fmd/prevention.asp>.
- USDA APHIS. Routine biosecurity measures for on-site farm visits or other livestock concentration points. Accessed June 21, 2005 at <http://www.aphis.usda.gov/lpa/issues/fmd/fmdbiose.html>.
- Washington State Department of Agriculture. Animal Health Program. Operational emergency response regarding highly contagious or foreign animal diseases. Annex 1. Accessed on July 7, 2005 at <http://agr.wa.gov/FoodSecurity/Attachments/Annex1ProducersDairies.pdf>.

# PREVENTION PRACTICES FOR FMD APPENDIX A



Sample signs to post at the farm entrance in the event of a FMD outbreak in the U.S.  
(Available from your state livestock extension specialist or the CFSPH web site at [www.cfsph.iastate.edu](http://www.cfsph.iastate.edu))



Additional signage available from private companies  
(Those listed below are available from Gempler's).





# PREVENTION PRACTICES FOR FMD APPENDIX C



## IMAGES OF FOOT-AND-MOUTH DISEASE (FMD) Signs of Illness in Cattle

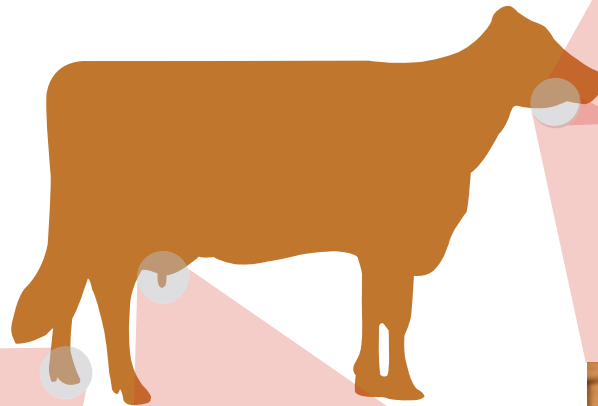
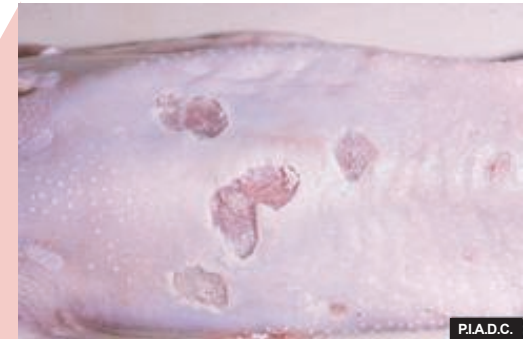


photo courtesy of Plum Island Animal Disease Center



Ulcers on the tongue

photo courtesy of [www.scotland.gov.uk/Topics/Agriculture/animal-welfare/Diseases/SpecificDisease/FootAndMouthDisease/ClinicalSigns](http://www.scotland.gov.uk/Topics/Agriculture/animal-welfare/Diseases/SpecificDisease/FootAndMouthDisease/ClinicalSigns)



Ulcer between the toes

photo courtesy of Plum Island Animal Disease Center



Ruptured blister on the end of a teat

photo courtesy of The Gray Book



Excessive drooling following blistering and lesions in the mouth



## EPA and USDA Approved Disinfectants for Foot-and-Mouth Disease Virus

**Note: Before disinfecting, all surfaces must be cleaned. This includes removing any visible material such as manure, bedding and feed.**

Product	Dilution	Mixing Instructions	Comments
Sodium hypochlorite 5.25% (NaOCl) (household bleach)	3%	2 gallons of bleach to 3 gallons of water. Mix thoroughly.	Not effective when area/objects are not clean; unstable in warm, sunny conditions.
Acetic acid	4-5%	6.5 oz. glacial acetic acid to 1 gallon of water. Mix thoroughly.	Vinegar is a 4% solution of acetic acid.
Potassium peroxy- monosulfate and so- dium chloride	1%	Follow label directions.	e.g. Virkon-S
Sodium carbonate (soda ash)	4%	5.33 oz. sodium carbonate to 1 gal- lon of hot water <b>OR</b> 1 lb. soda ash to 3 gallons of hot water. Mix thoroughly.	The solution is mildly caustic (irritates skin), but can dull paint and varnished surfaces.
Sodium hydroxide (lye, NaOH)	2%	1/3 cup of NaOH pellets (2.7 oz. of lye) to 1 gallon of cold water. Add lye to the water. Mix thoroughly.	<b>This solution is highly caustic (skin burns, damage metals).</b> Use protective (water-resistant) clothing, gloves and safety glasses. <b>Warning: Always add the lye to the water.</b> Never pour the water over the lye.

Source: USDA. National Emergency Response to a Highly Contagious Animal Disease,  
Executive Summary. Appendix III – Disinfectants for Foot-and-Mouth Disease,  
Field Use. March 30, 2001. At <http://www.aphis.usda.gov/oa/pubs/fco412.pdf>.



# PREVENTION PRACTICES FOR FMD

## APPENDIX E



### BIRD & RODENT CONTROL MEASURES



 the Center for  
Food Security  
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FMD virus may be spread on the fur, feathers or feet of some animals. Birds and rodents may spread FMD for a short time and distance during an outbreak and can also contaminate feed and water sources. Control programs should be implemented to minimize their numbers and the risk of disease spread on your farm.

#### ■ Eliminate openings for rodents or birds to enter, especially feed storage or processing areas.

- Seal any opening greater than  $\frac{1}{4}$  to  $\frac{1}{2}$  inch with a durable material such as steel wool packed tightly into openings.
- Use materials that cannot be easily gnawed or pecked through such as concrete, sheet metal, wire mesh, aluminum or brick. Plastic sheeting, wood, rubber will not be adequate.
- Check openings around augers, pipes and wires. Use mortar, masonry or metal collars in these areas.
- Doors, windows and screens should fit tightly. The distance between the bottom of the door and threshold should not exceed  $\frac{1}{4}$  inch.
- Drainage pipes or sewage systems may be used by rodents as routes to enter buildings. Equip floor drains with metal grates (openings less than  $\frac{1}{4}$ ").

#### ■ Remove potential hiding, resting and nesting sites.

- Equipment (e.g., refrigerators, powerwashers, etc.) should be raised and easily movable to allow for easy cleaning behind and underneath them.
- Sacked feed should be stacked on pallets with adequate space around and under them to allow easy inspection for signs of rodent activity and trap or bait placement.
- Rats can burrow and nest under feed bunks placed directly on the ground. Use of a concrete base around feed bunks can eliminate habitat.
- Maintain the water level in livestock waterers so it is deep enough that birds cannot stand in it.
- Hanging strips of heavy plastic vertically in doorways of buildings will allow machinery and people to pass through but keeps birds out. This will not prevent rodent entry.
- Cover the undersides of rafters with netting to exclude birds from nesting sites.

#### ■ Eliminate potential food sources.

- Store feed in well sealed containers (preferably metal with tight fitting lids).
- Use covered feeders that exclude birds.
- Clean up any spilled feed immediately.

#### ■ Proper disposal of garbage and dead animals is a very important part of rodent control.

#### ■ Establish a rodent barrier around buildings.

- A 3 foot wide weed free area with a gravel rock perimeter can be used to prevent weed growth and discourage rodents from burrowing.
- Gravel (at least 1 inch diameter) should be placed in a band at least 3 foot wide and 6 inches deep.

#### ■ Trapping is an effective way to control rodents.

- Proper placement of traps and baits is important. Set traps close to walls, behind objects, in dark corners, in places where rodent activity is evident.
- Use talc or flour patches to track where rodents are active.

#### ■ Baiting may be used to control rodents.

- When using rodenticide baits, first read the label carefully and fully follow the directions.
- Use the amount of bait indicated on the package. Requirements differ between products.
- Protect baits from the weather.
- Be sure baits are not accessible to children, farm or domestic animals and birds.
- Inspect baits regularly. Check often for dead rodents and burn or bury those you find.

#### ■ Other control measures are available, but beyond the scope of this document. Contact a wildlife pest control operator in your state for further assistance.

#### ■ Check local legislation for allowable bird control measures. Many birds are protected by state and/or federal law.

#### For More Information

Pierce RA. Bait Stations for Controlling Rats and Mice. University of Missouri Extension. <http://muextension.missouri.edu/explore/agguidees/wildlife/g09444.htm>.

Brittingham MC, Falker ST. Controlling birds around farm buildings. Pennsylvania State University Extension. <http://pubs.cas.psu.edu/FreePubs/pdfs/uh126.pdf>.

See T. Controlling rodents. North Carolina State University Extension. <http://www.thepigsite.com/Featured Article/Default.asp?Display=1015>.

Baker RO, Bodman GR, Timm RM. Rodent- proof construction and exclusion methods. University of Nebraska. [http://www.ces.ncsu.edu/nreos/wild/pdf/wildlife/RODENT\\_PROOF\\_CONSTRUCT.PDF](http://www.ces.ncsu.edu/nreos/wild/pdf/wildlife/RODENT_PROOF_CONSTRUCT.PDF).