

# Foot-and-Mouth Disease

Foot-and-mouth disease (FMD) is a severe, highly contagious viral disease of cattle and swine. It also affects sheep, goats, deer, and other cloven-hooved ruminants. FMD is not recognized as a zoonotic disease.

This country has been free of FMD since 1929, when the last of nine U.S. outbreaks was eradicated.

The disease is characterized by fever and blister-like lesions followed by erosions on the tongue and lips, in the mouth, on the teats, and between the hooves. Most affected animals recover, but the disease leaves them debilitated. It causes severe losses in the production of meat and milk.

Since it spreads widely and rapidly and because it has grave economic as well as clinical consequences, FMD is one of the animal diseases that livestock owners dread most.

## What Causes It

FMD is caused by a virus. Signs of illness can appear after an incubation period of 1 to 8 days, but often develop within 3 days.

The virus survives in lymph nodes and bone marrow at neutral pH, but is destroyed in muscle when pH is less than 6.0, i.e., after rigor mortis. The virus can persist in contaminated fodder and the environment for up to 1 month, depending on the temperature and pH conditions.

There are seven known types and more than 60 subtypes of the FMD virus. Immunity to one type does not protect an animal against other types.

## How It Spreads

FMD viruses can be spread by animals, people, or materials that bring the virus into physical contact with susceptible animals. An outbreak can occur when:

- Animals carrying the virus are introduced into susceptible herds.
- Contaminated facilities are used to hold susceptible animals.
- Contaminated vehicles are used to move susceptible animals.
- Raw or improperly cooked garbage containing infected meat or animal products is fed to susceptible animals.

- People wearing contaminated clothes or footwear, or using contaminated equipment, pass the virus to susceptible animals.
- Susceptible animals are exposed to materials such as hay, feedstuffs, hides, or biologics contaminated with the virus.
- Susceptible animals drink common source contaminated water.
- A susceptible animal is inseminated by semen from an infected animal.

## Signs

Vesicles (blisters) followed by erosions in the mouth or on the feet and the resulting excessive salivation or lameness are the best known signs of the disease. Often blisters may not be observed because they easily rupture, leading to erosions.

These signs may appear in affected animals during an FMD outbreak:

- Marked rise in body temperature for 2 to 3 days.
- Vesicles that rupture and discharge clear or cloudy fluid, leaving raw, eroded areas surrounded by ragged fragments of loose tissue.
- Production of sticky, foamy, stringy saliva.
- Reduced consumption of feed due to painful tongue and mouth lesions.
- Lameness with reluctance to move.
- Abortions.
- Low milk production (dairy cows).
- Myocarditis (inflammation of the muscular walls of the heart) and death, especially in newborn animals.

Animals do not normally regain lost weight for many months. Recovered cows seldom produce milk at their former rates, and conception rates may be low.

## Confusion With Other Diseases

FMD can be confused with several similar but less harmful diseases, such as vesicular stomatitis, bluetongue, bovine viral diarrhea, foot rot in cattle, and swine vesicular disease. Whenever mouth or feet blisters or other typical signs are observed and reported, laboratory tests must be completed to determine whether the disease causing them is FMD or not.

## Where FMD Occurs

While the disease is widespread around the world, North America, Central America, Australia, New Zealand, Japan, Chile, and many countries in Europe

are considered free of FMD. Various types of FMD virus have been identified in Africa, South America, Asia, and some parts of Europe.

### **Prevention and Control**

FMD is one of the most difficult animal infections to control. Because the disease occurs in many parts of the world, there is always a chance of its accidental introduction into the United States.

Animals and animal byproducts from areas known to be affected are prohibited entry into this country.

Livestock animals in this country are highly susceptible to FMD viruses. If an outbreak occurred in the United States, this disease could spread rapidly to all sections of the country by routine livestock movements unless it was detected early and eradicated immediately.

If FMD were to spread unchecked, the economic impact could reach billions of dollars in the first year. Deer and other susceptible wildlife populations could become infected and potentially serve as a source for reinfection of livestock.

Vaccines for FMD are available, but must be matched to the specific type and subtype of virus causing the outbreak. Vaccination can help contain the disease if it is used strategically to create barriers between FMD-infected zones and disease-free areas.

### **What You Can Do**

You can support U.S. efforts against FMD by:

- Watching for excessive salivation, lameness, and other signs of FMD in your herd; and
- Immediately reporting any unusual or suspicious signs of disease to your veterinarian, to State or Federal animal disease control officials, or to your county agricultural agent.
- When traveling outside the United States, ensuring that you do not bring back prohibited animal products or other at-risk materials (see APHIS Factsheet on Protecting America from FMD).

If FMD should appear in your animals, your report will set in motion an aggressive State and Federal eradication program.

Your participation is vital. Both the early recognition of disease signs and the prompt notification of veterinary officials are essential if eradication is to be carried out successfully. Your warning may prevent FMD from becoming established in the United States, or, if it does spread, reduce the time and money needed to wipe it out.

### **Additional Information**

For more information about FMD, contact:

USDA, APHIS, Veterinary Services  
National Center for Animal Health Emergency  
Management

4700 River Road, Unit 41  
Riverdale, MD 20737-1231

Phone: (301) 734-8073

Fax: (301) 734-7817

Current information on animal diseases and disease outbreaks is also available on the Internet at <<http://www.aphis.usda.gov>>.

---

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.