



# FrontLine®

TECHNICAL INFORMATION FOR  
TODAY'S FEED PROFESSIONAL

## Foot-and-Mouth Disease

Foot-and-mouth disease (FMD) is a severe, highly communicable 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. Many affected animals recover, but the disease leaves them debilitated. It causes severe losses in the production of meat and milk. Because 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

The disease is caused by a virus. The virus survives in lymph nodes and bone marrow at neutral pH, but destroyed in muscle when  $\text{pH} < 6.0$  i.e. after rigor mortis. The virus can persist in contaminated fodder and the environment for up to one month, depending on the temperature and pH conditions. There are at least seven separate types and many subtypes of the FMD virus. Immunity of one type does not protect an animal against other types.

### How It Spreads

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

- People wearing contaminated clothes or footwear or using contaminated equipment pass the virus to susceptible animals.
- 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.
- 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 cow is inseminated by semen from an infected bull.

### Signs

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

Some of these other signs may appear in affected animals during an FMD outbreak:

- Ruptured vesicles discharge either clear or cloudy fluid and leave raw, eroded areas surrounded by ragged fragments of loose tissue.
- Sticky, foamy, stringy saliva is produced.
- Consumption of feed is reduced because of painful tongue and mouth lesions.
- Lameness with reluctance to move is often observed.
- Abortions often occur.
- Milk flow of infected cows drops abruptly.
- Conception rates may be low.
- FMD can lead to myocarditis (inflammation of the muscular walls of the heart) and death, especially in newborn animals.



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Animals do not normally regain lost weight for many months. Recovered cows seldom produce milk at their former rates.

### **Confusion With Other Diseases**

FMD can be confused with several similar, but less harmful, diseases, such as vesicular stomatitis, bluetongue, bovine viral diarrhea, and foot rot in cattle, vesicular exanthema of swine, 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.

### **Where FMD Occurs**

While the disease is widespread around the world, North America, Central America, Australia, New Zealand, Chile, and some countries in Europe are considered free of FMD. Various types of FMD virus have been identified in Africa, South America, Asia, and part 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 infected 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 wildlife populations could become infected rapidly and could be a source for reinfection of livestock.

### **What You Can Do**

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

- Watching for slobbering, 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.
- If FMD should appear in your animals, your report will set in motion an effective 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, and Veterinary Services Emergency Programs  
4700 River Road, Unit 41  
Riverdale, MD 20737-1231  
Telephone (301) 734-8073  
Fax (301) 734-7817

Current information on animal diseases and suspected outbreaks is also available on the Internet at  
<http://www.aphis.usda.gov/oa/pubs/fsfmd301.pdf>