

# Foot-and-Mouth Disease May Threaten North American Wildlife

**The ongoing pandemic of foot-and-mouth disease in Europe and other parts of the world is of great concern to the North American agricultural community. Foot-and-mouth disease may also pose a significant threat to North American wildlife.**

While foot-and-mouth-disease (FMD) is primarily an economically devastating disease of domestic livestock, experimental studies have clearly demonstrated that it also threatens wildlife. North American wildlife including white-tailed deer, other deer species, feral pigs, bison, moose, antelope, peccaries, musk ox, caribou, sheep and elk are susceptible to FMD. USGS scientists are concerned about this potential threat.

FMD is a highly infectious and extremely difficult to control viral disease of cattle, domestic sheep, goats and swine. Most affected animals recover, but the disease leaves them debilitated and causes severe losses in the production of meat and milk. Routine livestock movements can rapidly spread the disease, making early detection crucial for disease control. Left unchecked, the economic impact of FMD could reach billions of dollars in the first year. Because the disease can easily be confused with several diseases with very similar external appearances, laboratory confirmation is required before a diagnosis is made. FMD is not known to cause serious illness in humans and does not infect horses, mules or burros.

Wildlife disease specialists at the USGS National Wildlife Health Center are monitoring the outbreak in Western Europe and other parts of the world. Specialists are interacting with the US Department of Agriculture (USDA), and working with US Department of Interior land management and conservation agencies to provide infor-

mation on disease status and risks and assist in developing FMD prevention and contingency plans.

Domestic livestock and wildlife can spread the disease to each other. In some countries where FMD has become established, wild ungulates have been shown to harbor and spread the virus to livestock despite vaccination and control efforts. In other cases, FMD has been successfully eradicated from livestock without involving wildlife. However, most free-living North American wildlife have had no previous virus exposure, and there is very little information available about their vulnerability. The USDA has documented the effects of the disease in white-tailed deer; but based on information from other countries, it is probable that the disease will affect other susceptible North American species quite differently.

Domestic animals, wildlife, people and materials that are infected or have had contact with infected animals can spread FMD. Direct contact is the most probable method of infection, since infected animals produce a great amount of saliva containing the virus. Bedding, hay and other feed sources – including raw or improperly cooked garbage containing infected meat or animal products – can also be a source of the virus to susceptible animals. People, contaminated clothes and footwear, and equipment (including vehicles) can also spread the disease. The virus can persist in contaminated fodder and the environment (soil, water, leaf litter) for up to 1 month, depending on environmental conditions. Cool and



*Caribou, white-tailed deer fawn*



moist conditions favor the virus, while hot temperatures, direct sunlight and dry conditions are unfavorable. The virus can be killed by easily obtained solutions such as bleach, acetic acid (vinegar) and hydrogen peroxide.

All FMD vaccines are made from killed virus and provide only short-term protection. Animals must be re-vaccinated approximately every 6 months. In addition, FMD has 7 serotypes and over 60 subtypes, and no current single vaccine is effective against all the variants. The subtype can change during an outbreak, necessitating a change in vaccine and leaving animals vaccinated against a different subtype vulnerable to the new viral strain. Vaccinated animals get a much milder version of the disease and may become a source of infection for other animals.

Each US state is developing its own FMD emergency response plan, so there will be differences in the treatment of wildlife from state to state. Federal land management agencies will also enact their own plans, although efforts are underway to standardize the response. In some instances, wildlife may be targeted for disease control efforts.

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