

Foot And Mouth Disease And Its Impact On Livestock Health

Oshwin Patil

Apollo College of Veterinary Medicine, Jaipur, Rajasthan, India

Abstract

Foot and Mouth Disease (FMD) is a highly contagious viral disease affecting cloven-hoofed animals such as cattle, buffaloes, sheep, goats, pigs, and wildlife species. The disease is caused by the Foot and Mouth Disease Virus belonging to the family *Picornaviridae*. FMD is characterized by fever and vesicular lesions in the mouth, feet, and teats, leading to excessive salivation, lameness, reduced milk production, weight loss, reproductive disorders, and mortality in young animals. The disease spreads rapidly through direct contact, contaminated materials, aerosols, and infected animal products, making it one of the most economically important transboundary animal diseases worldwide. Outbreaks of FMD cause severe economic losses due to decreased livestock productivity, trade restrictions, increased disease management costs, and disruption of dairy and meat industries. Although human infection is rare, the disease significantly affects food security and rural livelihoods, particularly in developing countries. Effective control strategies include regular vaccination, strict biosecurity measures, surveillance, movement restrictions, rapid diagnosis, and public awareness among livestock owners. International organizations and veterinary authorities continue to promote coordinated disease control programs to reduce the global burden of FMD. Strengthening veterinary infrastructure, improving vaccine coverage, and adopting scientific management practices are essential for sustainable control and eventual eradication of this economically devastating livestock disease.

Keywords: Foot and Mouth Disease; FMD virus; Livestock disease; Vaccination; Biosecurity; Transboundary animal disease

Introduction

Foot and Mouth Disease (FMD) is one of the most highly contagious viral diseases affecting cloven-hoofed animals such as cattle, buffaloes, sheep, goats, pigs, and several wild animal species. The disease is caused by the Foot and Mouth Disease Virus (FMDV), which belongs to the genus *Aphthovirus* under the family *Picornaviridae*. FMD is considered a major transboundary animal disease because of its rapid spread, severe economic consequences, and impact on international livestock trade. The disease is characterized by fever and the formation of vesicles or blisters in the mouth, tongue, gums, teats, and feet of infected animals. Although adult animals usually recover, the disease causes severe production losses including reduced milk yield, weight loss, infertility, poor growth, and decreased work efficiency. Young animals may suffer high mortality due to myocarditis. FMD is endemic in many developing countries and remains a significant challenge for the livestock sector worldwide. The livestock industry plays a crucial role in food security and the rural economy, especially in countries like India where millions of farmers depend on dairy and animal husbandry for their livelihood. Therefore, prevention and control of Foot and

Mouth Disease are essential for sustainable livestock development and economic stability.

Transmission and Clinical Signs

Foot and Mouth Disease spreads rapidly through direct and indirect contact with infected animals. The virus is present in saliva, milk, semen, urine, feces, and exhaled air of infected animals. Transmission can occur through contaminated feed, water, equipment, vehicles, clothing, and animal products. Airborne transmission over long distances is also possible under favorable environmental conditions. The incubation period generally ranges from 2 to 14 days depending on the viral strain, species affected, and immune status of the animal. Infected animals initially show fever, dullness, reduced appetite, and decreased milk production. Soon after, painful vesicles develop in the mouth and interdental spaces of the feet. These blisters rupture, leaving ulcers that cause excessive salivation, lameness, and difficulty in eating and walking. In dairy animals, teat lesions may lead to mastitis and secondary bacterial infections. Calves and young animals are particularly vulnerable and may die suddenly due to heart muscle damage even without visible lesions. Sheep and goats often show mild clinical signs,

making disease detection difficult and increasing the risk of silent transmission. Because of its highly contagious nature, even a single infected animal can rapidly spread the disease within herds and neighboring regions if proper control measures are not implemented immediately.

Economic Importance and Public Health Concerns

Foot and Mouth Disease causes enormous economic losses worldwide. Reduced milk production, weight loss, reproductive failure, decreased draught power, mortality in young animals, and trade restrictions significantly affect livestock productivity. Farmers often suffer severe financial hardship due to reduced market value of animals and increased expenditure on treatment and disease management. Countries free from FMD maintain strict import regulations to prevent entry of infected animals and animal products. Outbreaks in previously disease-free countries can lead to massive economic damage due to culling programs, trade bans, and disruption of the livestock industry. Although FMD is primarily an animal disease, its indirect effects on food security and rural livelihoods are substantial. Milk and meat production decline during outbreaks, affecting the supply chain and income of small-scale farmers. In regions heavily dependent on dairy farming, repeated outbreaks can negatively impact rural economies for extended periods. Human infection with FMD virus is extremely rare and generally mild. Therefore, FMD is not considered a major public health threat compared to other zoonotic diseases. However, the disease remains critically important because of its devastating effects on animal health and agricultural economics.

Prevention and Control Strategies

Effective prevention and control of Foot and Mouth Disease require a combination of vaccination, surveillance, biosecurity, and movement control measures. Vaccination is one of the most important tools used in endemic countries to reduce disease incidence and limit virus circulation. Regular vaccination programs using quality vaccines matched to circulating viral strains help develop herd immunity and protect livestock populations. Strict biosecurity practices should be followed on farms to prevent introduction and spread of

the virus. Isolation of newly purchased animals, restriction of animal movement during outbreaks, proper sanitation of vehicles and equipment, and disinfection of premises are essential preventive measures. Rapid diagnosis and reporting are crucial for controlling outbreaks. Veterinary authorities should conduct regular surveillance and laboratory testing for early detection of infection. Infected and suspected animals should be isolated immediately to minimize transmission. Public awareness among farmers regarding disease recognition, vaccination schedules, and biosecurity practices is equally important. Governments and veterinary organizations should strengthen disease monitoring systems and improve coordination among stakeholders involved in livestock health management.

Advances in molecular diagnostics, vaccine development, and epidemiological surveillance are improving the global capacity to control FMD. International organizations such as the Food and Agriculture Organization (FAO) and the World Organisation for Animal Health (WOAH) continue to support global efforts toward progressive control and eradication of the disease.

Conclusion

Foot and Mouth Disease remains one of the most economically important viral diseases of livestock worldwide. Its highly contagious nature, rapid transmission, and severe impact on productivity make it a major concern for farmers, veterinarians, and policymakers. Although the disease rarely affects humans, its consequences on livestock health, food security, and the rural economy are profound. Sustainable control of FMD requires coordinated efforts involving vaccination, surveillance, biosecurity, farmer education, and strong veterinary infrastructure. Adoption of scientific disease management strategies and strengthening of national control programs are essential to minimize economic losses and improve livestock productivity. Continuous research and international cooperation will play a vital role in achieving long-term control and eventual eradication of Foot and Mouth Disease.

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