भा.कृ.अनु.प. -राष्ट्रीय खुरपका और मुंहपका रोग संस्थान

ICAR - National Institute on Foot and Mouth Disease

FMD Case Study Series-2025

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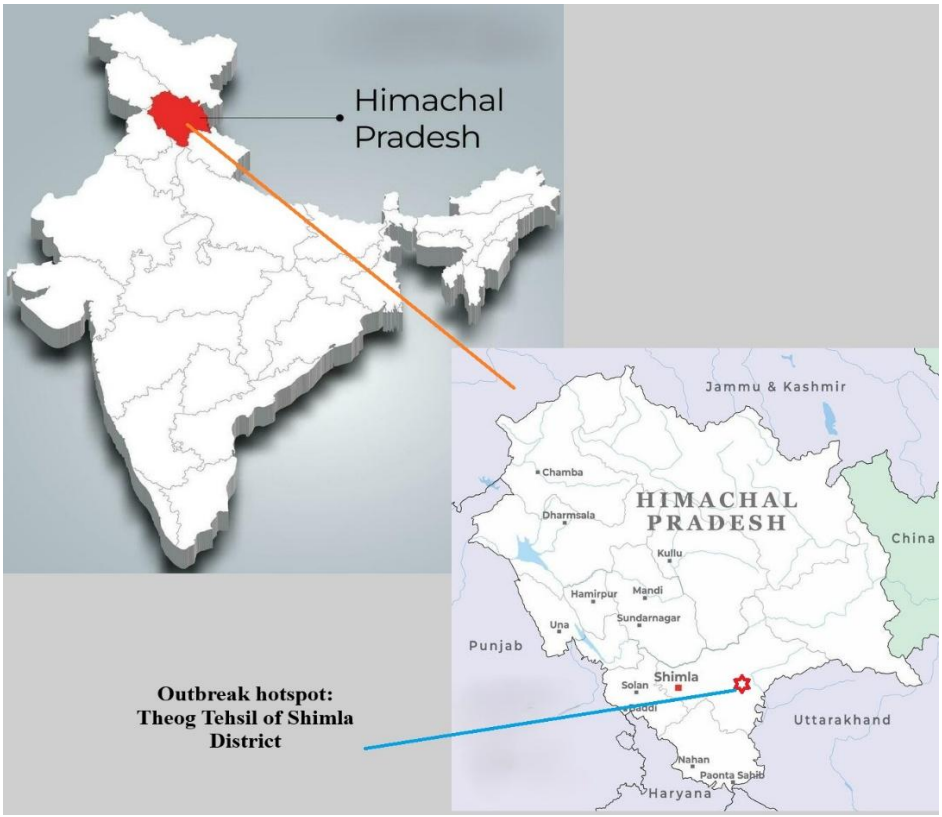
Case Study Number:		**04/2025**
State involved:		Himachal Pradesh
Area/District:		Theog, Shimla district
Month/Year:		April/2025
Primary Species affected:		Cattle (Ghoond Balsan Wasi Gausadan)

Investigation of a Foot-and-Mouth Disease (FMD) Outbreak in a Gausadan in the Shimla district of Himachal Pradesh



Case History: An outbreak of Foot-and-Mouth Disease (FMD) was reported from Ghoond Balsan Wasi Gausadan (cow shelter) located in Balghar village, Theog block, Shimla district, Himachal Pradesh, which falls under the mid-hill zone with a mild temperate climate. The geographical coordinates of the Gausadan are 31.05° N latitude and 77.45° E longitude. The shelter housed a total of 348 cattle at the time of the outbreak. The Gausadan had a history of poor biosecurity practices, including the introduction of unproductive animals of unknown origin without proper records of ownership, health and vaccination status. No isolation or quarantine measures were followed during the introduction of new animals, which likely facilitated the entry and spread of infection. The animals in Gausadan had been vaccinated against FMD on 09th April, 2025, under the ASCAD (Assistance to States for Control of Animal Diseases) programme. The first clinical case was reported on 15th April, 2025. Affected animals showed pyrexia, and five animals exhibited characteristic foot lesions, consisting of fluid-filled vesicles in the interdigital spaces, which later ruptured to form painful ulcers, leading to lameness. Supportive treatment was initiated immediately on 15th April 2025. Treatment included systemic antibiotics (oxytetracycline), antipyretic and anti-inflammatory drugs (meloxicam and paracetamol combination), antihistaminic (chlorpheniramine maleate), and local management of lesions by washing with 1% potassium permanganate solution followed by application of glycerine as an emollient. Animals were monitored daily, and treatment was continued as required. The number of animals showing clinical signs increased to 32 on 16th April, 2025. With continued treatment and monitoring, the number of clinically affected animals gradually declined. By 23rd April, 2025, twenty-seven animals had recovered, while five animals continued to show clinical signs. These included four cross-bred Jersey females aged between 7 and 9

years and one male aged over 12 years, all of which exhibited foot lesions. No new cases were observed after 26th April, 2025, and the outbreak was considered to have subsided by 28th April, 2025.

Field Investigation and Epidemiology: Field investigation revealed several epidemiological risk factors contributing to the outbreak. The Gausadan is located near a local livestock market at Sainj, which could have served as a potential source of infection either directly or indirectly through fomites, personnel, or animal movement. The absence of strict biosecurity measures, lack of animal movement records, and failure to implement quarantine for newly introduced animals were identified as major predisposing factors. Despite recent vaccination, the occurrence of the outbreak within a short interval suggested possible exposure to the field virus before the development of protective immunity, high infection pressure, or introduction of infected animals. The clustering of persistent clinical cases among older and cross-bred animals indicated a possible influence of age, stress, or reduced immune response on disease severity and recovery. The pattern of disease spread and subsequent decline following movement restriction and supportive treatment suggested effective local containment once control measures were initiated.

There was a relatively rapid spread of infection within the Gausadan, with approximately 9.2% (32/348) of the animals showing clinical signs within a short duration following the first reported case. The incubation period for Foot-and-Mouth Disease (FMD) generally ranges from 2 to 14 days, varying by animal species (cattle 2-14 days, sheep/goats 3-8 days, pigs can be 18 hours to 3 days) and circumstances, with virus shedding and potential transmission occurring even before clinical signs appear. For official trade purposes, the World Organisation for Animal Health (WOAH) defines it as 14 days. It has been observed that panic immunisation is performed if an outbreak is suspected. In such instances, the animals may show clinical FMD immediately post vaccination. It may lead to a doubt on safety of the vaccine used, indicating contamination with live virus sometimes. Since only some animals, out of the total population of the Gausadan, were showing clinical signs, the possibility of vaccine contamination was ruled out. It is evident that the infection was perhaps in the incubation period while vaccination was being done and the animals might have been exposed to the virus during the window period before development of protective immunity.

Laboratory Diagnosis: Samples from five clinically affected animals were collected for laboratory confirmation on 23rd April, 2025. These samples included epithelial tissue around the active vesicles in the hooves of affected animals. The samples were received at ICAR-NIFMD, Bhubaneswar, on 02nd May, 2025. Confirmatory testing was completed on 13th May, 2025. Out of the five samples tested, three samples were confirmed positive for Foot-and-Mouth Disease Virus (FMDV) serotype O by FMDV serotyping ELISA and FMDV RT-multiplex PCR (RT-mPCR). The positive samples were obtained from one male aged 12 years and 3 months and two females aged 9 years and 7 years 8 months, respectively. These results confirmed FMDV serotype O as the etiological agent responsible for the outbreak.

Socioeconomics of FMD outbreak: The studied Gausadan housed a total of 348 cattle at the time of the outbreak. That itself is a large number and emphasises the importance of cow shelters in a country like India, where the population of FMD susceptible animals of different species is more than 300 million. If the animal incubating the FMD virus had been allowed to stray in the region, a major outbreak would have resulted leading to economic losses arising from morbidity, reduced milk production, mortality, weight loss, infertility/abortions, mastitis, treatment cost and distress sale. However, in the present case, with timely diagnosis and prompt implementation of control measures, the outbreak was restricted within the gausadan and did not spread to the surrounding region, thereby preventing further economic losses. According to available information, the Government of Himachal Pradesh (via Himachal Pradesh Gauseva Aayog) provides a direct state grant up to Rs.10 Lakh or 50% of project cost (whichever is less)

for a new Gausadan Setup and up to Rs. 5 Lakh or 50% estimated cost for expansion projects. Funds from the Animal Welfare Board of India (AWBI) are distributed as regular & rescue maintenance grants to recognized organizations. The state government has increased the monthly fodder grant for cattle housed in Gausadans from Rs. 700 to Rs. 1,200 per animal, effective August 2025. The Himachal Pradesh Gauseva Aayog's resources primarily come from a Rs. 2.50 per bottle liquor cess and 15% of the total receipts from temple trusts. Unwarranted disease episodes such as FMD substantially increase the operational and maintenance costs of Gausadans, primarily due to expenditure related to treatment and additional care of sick animals.

Control Measures and Recommendations: In a Gausadan or gaushala, it is difficult to implement stringent biosecurity measures as compared to a conventional cattle farm. By design, Gausadan serve as a rescue shelter. They are required to admit animals in distress due to disease, injury and old age complications. They also harbour those animals which are being illegally trafficked or are abandoned because of being unproductive. Often, such rescue centres are saturated to their full capacity, and there is little space available for quarantine of new animals or isolation of sick ones. Consequently, unlike a commercial farm, the number, and health status of newly introduced animals can neither be monitored nor managed as easily. This inherent operational limitation results in a persistent risk of introduction and transmission of infectious diseases in a Gausadan. Apart from newly introduced animals, the farm workers may also serve as a vehicle for both in and out movement of infectious agents.

Mandatory Quarantine:

- All animals brought to rescue centres or Gaushala facilities must undergo a quarantine period of at least 21 days.
- Clinical examination & testing for FMDV and other diseases should be done immediately on introduction and repeated before they mix with resident animals.
- Introduction of only those animals must be allowed that have undergone pre-entry health screening (temperature, history, signs of FMD, HS, BQ, mastitis, parasitism, etc.).
- There must be a recording of the source, transport, and previous health status of new animals as per the availability of information.
- Deworming, ectoparasite control, and vaccination during quarantine must be conducted.
- Preferably, a veterinary fitness certificate must be issued before introduction in Gaushala.

Vaccination and Biosecurity:

- Strengthening of biosecurity practices within rescue centres must be done diligently.
- Proper recording of vaccination, health status and visitors must be maintained to trace any disease occurrence.
- Regular vaccination of resident animals in accordance with state/central FMD control programs must be strictly followed.
- Mandatory vaccination of newly introduced animals must be done preferably during the quarantine period.
- Restriction on visitor access must be there, and only essential entry should be allowed.
- Staff should be assigned to specific zones; avoid moving between sick and healthy animal areas.
- Farm hygiene, disinfection and ventilation, etc., must be strictly maintained.

Gausadan/ Gaushala staff:

- The staff of a gaushala must be discouraged from handling outside animals, as they may act as a source of infection both ways, in and out of the gaushala.
- They must be well acquainted with biosecurity measures and modes of disease spread.

Housing of different age groups:

- There must be a separation of different age groups as far as possible.

- Susceptible animals and age groups must be kept separate from immunologically competent ones.

Laboratory Testing:

- As early as possible, clinical samples should be submitted to an **authorised FMD diagnostic laboratory** for confirmation before integration.
- Irrespective of the fact that the animal may be found negative in the test report, the quarantine period must be completed.

Routine Health Monitoring

- There must be daily observation for the health status of animals, which includes clinical signs like fever, salivation, nasal discharge, wounds, lameness, diarrhoea, and respiratory distress.
- Immediate isolation of sick animals must be done.

Strict Regulation of Animal Movement:

- Illegal trafficking of cattle, buffalo, or any FMD-susceptible species poses a **high biosecurity threat**. Such movements must be strictly monitored, documented, and controlled by appropriate authorities.
- An episode of FMD in a Gaushala must be traced back to the site of origin, and appropriate control measures must be implemented.

Conclusion: In India, the stray cattle have become a challenge regarding control of animal disease spread, animal welfare, vaccination record maintenance, community & road safety and overall one-health. The present case study documents a confirmed outbreak of FMD caused by serotype O in a Gausadan at Theog, Himachal Pradesh. The outbreak affected a limited proportion of the herd, and early detection, prompt supportive treatment, and continuous monitoring played a crucial role in reducing disease severity and facilitating recovery in the majority of affected animals. Some level of immunity due to vaccination at the time of the outbreak also must have played a positive role in keeping the outbreak restricted, if not completely preventing it. This emphasises the importance of a Gausadan because, had these animals been allowed to stray in the region, it would have been difficult to restrict, monitor, vaccinate and provide them with treatment. Laboratory confirmation by serotyping ELISA and RT-mPCR established the etiological agent and provided epidemiological clarity. The studied case emphasizes the need for stringent biosecurity measures, especially in high-density animal shelters such as Gausadans. Older and cross-bred animals appeared to exhibit prolonged clinical illness, suggesting a possible influence of age and physiological status on disease outcome. This also indicates that susceptible animals must be kept separate from the stronger ones, as they may act as a source of infection for each other, depending on the condition. An immunologically competent animal may act as an asymptomatic carrier and introduce infection to a susceptible animal. On the other hand, a susceptible animal may act as an amplifier for infection, thus elevating the virus load in the premises to a level that is overwhelming for the stronger animals. The studied episode is very similar to cases where panic vaccination is performed on suspecting an outbreak. Further, strengthening surveillance, ensuring timely vaccination with effective vaccine strains, and reinforcing movement control and hygiene practices are essential to prevent recurrence. This case underscores the continued risk of FMD in endemic regions and the necessity of integrated disease control strategies under the national FMD control framework. It also highlights the important role a Gausadan plays in keeping restrictions on the spread of highly contagious animal diseases like FMD, and, also, at the same time, how vulnerable they are themselves to the invasion of such diseases.