



# 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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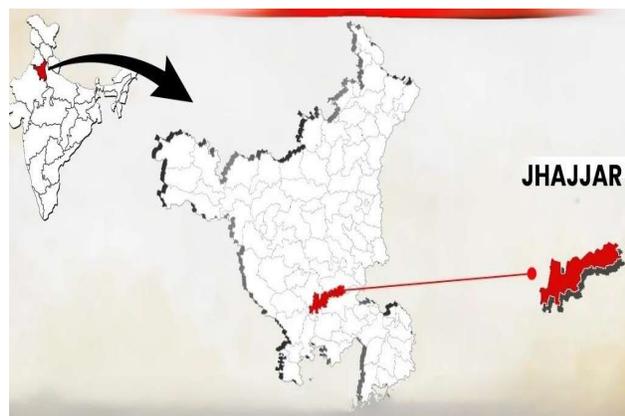
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<b>Case Study Number:</b>	<b>01/2025</b>
<b>State involved:</b>	Haryana
<b>Area/District:</b>	Kharhar, Bahadurgarh, Jhajjar
<b>Month/Year:</b>	March/2025
<b>Primary Species affected:</b>	Swine/Pigs

## **FMD outbreak in Piggery farm in Haryana**



**Sample collection from the affected farm**



**Outbreak hotspot**

### **1. Case History:**

An episode of FMD was observed in a piggery unit in village Kharhar, Tehsil Bahadurgarh, District Jhajjar of Haryana state, India (28° 43' 8.6088" N; 76° 46' 21.3774" E). According to the case history, the disease occurred following the introduction of piglets purchased from Rajasthan, for which no history of FMD vaccination was available. The index case was first observed by the owner on 16.03.2025. Piggery Farm had 150 pigs (Adult: 50; Young: 100). Based on the anamnesis, twenty-five piglets exhibited clinical signs, and six died within five days in a single pen. Subsequently, two more piglets died, taking the death toll to eight, indicating a case fatality rate of 32% in piglets. Some affected piglets died suddenly, while others that survived longer developed FMD-like lesions. The clinically sick animals were provided supportive therapy, including antibiotics and NSAID (flunixin). Two piglets were presented for necropsy at the Department of Veterinary Public Health and Epidemiology, LUVAS, Hisar on 21.03.2025. Necropsy Samples were collected and tested at the Regional Research Centre on FMD, Department of Veterinary Microbiology, LUVAS. FMDV serotype O was detected by sandwich ELISA and RT-mPCR. For further confirmation, serum samples and tissues preserved in buffered glycerol and formalin were referred to ICAR-NIFMD, Bhubaneswar on 26.03.2024. ICAR-NIFMD confirmed that the outbreak was caused by FMDV serotype O.

### **2. Field Investigation and Epidemiology:**

The LUVAS team visited the village Kharhar on 03.04.2025. The piggery farm was located on the outskirts of village, in the fields approximately 700-800 meter from the periphery of the village. This farm had been operating for 4-5 months. The owner informed the team that he had purchased some piglets from Rajasthan about 2 months back. The FMD vaccination history of these newly purchased piglets was unknown. The last FMDV vaccination in the village had been carried out in September 2024 for goats and in November 2024 for cattle & buffaloes. The pigs on the farm had been vaccinated against classical swine fever, and only the adult pigs had been vaccinated against FMD in November-December 2024 (with vaccine received from GVH Nayagaon). No history of any outbreak was reported on the farm. During the initial phase of the episode, eight piglets died. No mortality was observed thereafter. The owner also had 70-80 pigs slaughtered following the onset of the FMD outbreak. It was informed that only the piglets and grower pigs weighing less than 80 kg were affected, while adult pigs remained asymptomatic. The outbreak lasted for approximately 15-20 days.

In case of FMD, the herd immunity induced by vaccination generally declines by about 4-5 months post-vaccination if repeat vaccinations are not carried out. In the present case study, cattle and buffalo

in the area were vaccinated around November and the adult pigs of the affected farm had been vaccinated against FMD in November-December 2024. While, the outbreak occurred in March, indicating a possible decline in herd/population immunity in the nearby area.

### **3. Laboratory Diagnosis:**

Necropsy of two pigs was conducted at the Department of Veterinary Public Health and Epidemiology, LUVAS, Hisar on 21.03.2025. Samples were collected and sent to the Regional Research Centre on FMD, Department of Veterinary Microbiology, LUVAS. Initial screening by serotype differentiating Sandwich ELISA and RT-mPCR at RRC indicated that the incidence was due to FMDV serotype O. A team of scientists from RRC on FMD also visited the site of outbreak and brought additional samples for further testing. The heart samples, preserved in 50% buffered glycerol, tested positive by RT-mPCR for FMDV serotype O. The samples were referred to ICAR-NIFMD, Bhubaneswar for further confirmation and virus characterization.

### **4. Socioeconomics of FMD outbreak:**

The active outbreak lasted for approximately 15-20 days based on anamnesis and subsequent follow up of the episode. The livestock population directly at risk comprised 563 cattle, 1442 buffalo, 4 goat, and 4 scavenger pigs. Early containment of outbreak through strict biosecurity measures, timely reporting, rapid confirmatory diagnosis and strong vaccination induced immunity in the animal population thriving in proximity to the farm experiencing outbreak effectively limited virus transmission to neighbouring herds, thereby preventing widespread losses. Considering the prevention of direct economic losses arising from morbidity (to the tune of 50%), reduced milk production, mortality, weight loss, infertility/abortions, treatment cost and distress-sale etc., as estimated from published reports, an economic gain of approximately ₹1.9 crore was achieved due to the preventive measures implemented. However, the actual socio-economic gain could be much higher when assessed in a broader context. Successful curtailment of FMDV spread also prevent surge in animal product prices, escalation in crop farming expenses, shortage of veterinary supplies and impact on nutritional security for the local population. A catastrophic and widespread FMD outbreak can disrupt social stability; thus, the containment of this episode resulted in substantial perceptible socio-economic advantages.

### **5. Control Measures for Foot and Mouth Disease (FMD):**

The control measures for FMD are broadly categorized into two components:

- (1) Preventive actions to avoid the occurrence of outbreaks
- (2) Contingency plan for emergency response when an outbreak is suspected.

This approach ensures a formidable shield for the livestock against FMD, minimizes production losses, and supports the national goal of FMD elimination under the Livestock Health and Disease Control Programme (LHDCP).

#### **i. Preventive Measures (Before Outbreak Occurs):**

Preventive measures aim to build herd immunity, maintain farm-level biosecurity, and detect any early signs of viral circulation.

- **Mass Vaccination:** Systematic biannual vaccination of agriculturally important susceptible livestock (primarily cattle and buffalo, and other species as need may be) with a trivalent inactivated FMD vaccine. Ensuring close to 100% vaccination coverage, maintaining cold chain integrity, and maintaining digital vaccination records are essential.
- **Surveillance and Monitoring:** Continuous active and passive surveillance through clinical inspection, sero-surveillance, and laboratory diagnosis is carried out to detect early infection or viral circulation hotspots. Risk-based surveillance data guide targeted vaccination and resource allocation.

- **Biosecurity and Quarantine:** Enforcement of strict farm level biosecurity measures, including disinfection of vehicles, equipment, and personnel movement controls. Quarantine, health inspection and vaccination of newly purchased animals before their introduction to the herd are critical.
- **Awareness and Capacity Building:** Regular training of veterinarians, para-vets, and farmers on FMD recognition, vaccination practices, and early reporting. Awareness campaigns help ensure community participation in disease control.
- **Regulation of Livestock Movement and Trade:** Implementation of animal movement permits, health certification systems, and temporary restriction on livestock fairs or markets in high-risk zones in the event of an outbreak to reduce chances of virus spread.
- **Mapping and tracing of Disease hotspots:** Each and every disease occurrence of any aetiology must be considered for investigating the movement route of disease spread especially targeting the sources of animal trade. A map of hotspot of virus activity may be made accumulating data over a period of 2-3 years, which can make implementation of control measures easier.

#### ii. Emergency response contingency Measures (After Outbreak Occurs):

Once FMD is confirmed, rapid and well-coordinated field actions are initiated to restrict and ultimately eliminate infection.

- **Reporting:** The important prerequisite for control of any disease outbreak is timely reporting. The state government authorities must consider any suspected occurrence of infectious disease exhibiting clinical symptoms similar to FMD for laboratory screening of FMD by sending samples to the state FMD laboratory or ICAR-NIFMD, Bhubaneswar for confirmation.
- **Quarantine and Movement Restriction:** Immediate restriction on movement of animals, animal products, and transport vehicles in and out of the infected area. Notification of infected, surveillance, and buffer zones and cordon off the infected area limiting movement of people and animals including community grazing as much as possible.
- **Ring Vaccination:** Emergency ring vaccination within a 10 km radius of the affected site be carried out to create an immune barrier around the infected herd. Post-vaccination seromonitoring will confirm coverage and immune response. Suspected fresh cases if any in the ring vaccination zone should be reported and diagnosed promptly without fail.
- **Isolation and Supportive Veterinary Care:** Affected animals are segregated and provided supportive treatment to minimize mortality and secondary bacterial infections. Recovery monitoring is documented to assess productivity losses.
- **Cleaning, Disinfection, and Disposal:** Thorough cleaning and disinfection of infected premises using approved disinfectants (e.g., sodium carbonate, citric acid). Safe disposal of carcasses, milk, and contaminated feed, preferably by deep burial with lime under veterinary supervision.
- **Epidemiological Investigation:** Detailed tracing of the infection source, routes of transmission, and contact herds to implement corrective measures. Data are fed into national disease reporting systems (NADRS/NADCP MIS).
- **Public Communication and Reporting:** Timely communication with farmers, local authorities, and state control rooms ensures compliance and transparency. Regular updates are sent to DAHD and ICAR-NIFMD for national monitoring.

## **6. Conclusion:**

The disease incidence in the pig farm could be primarily attributed to the introduction of new animals without adequate quarantine. Strict adherence to quarantine protocols is essential, and only animals that have completed the quarantine period and are appropriately vaccinated should be inducted into the farm. Currently, pigs are not covered under vaccination in the LHDCP. However, vaccination can be carried out at the farm owner's discretion. The FMD vaccine presently used for bovines in India has been found suitable for use in pigs as well, as demonstrated in a recent study conducted by ICAR-NIFMD (unpublished data). An integrated approach combining preventive vaccination, farm-level biosecurity, rapid outbreak response, and public awareness and participation forms the cornerstones of India's FMD control strategy. Coordinated implementation of disease prevention and control campaign through the State Animal Husbandry Departments, with technical support from ICAR-NIFMD and policy guidance and funding from DAHD, Government of India is making steady progress towards achieving the national goal of FMD freedom through progressive zoning and eventual elimination.