

Research Article



Foot and Mouth Disease Outbreak Public Awareness: A Study of Knowledge, Attitudes and Practices of Farmers in Baring Village, Pangkajene and Islands Regency, South Sulawesi, Indonesia

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Abstract | This study aimed to assess knowledge, attitudes and practices (KAP) of farmers regarding Foot and Mouth Disease (FMD) in Baring Village, South Sulawesi, Indonesia, conducted between May and June 2023. A structured interviews and questionnaires were conducted with 52 farmers to evaluate the awareness, preventive measures and response strategies toward FMD. The results showed that a larger number of farmers primarily obtained information about FMD from relatives and community leaders. Although a majority considered FMD to be caused by a virus, misconceptions persisted regarding the etiology, clinical manifestations and transmission pathways. Farmers were majorly familiar with clinical signs such as excessive salivation, lesions on the feet and oral ulcers. Direct contact with contaminated feed and infected livestock was identified as the main transmission route. The most common preventive measures included isolating livestock from other herds, ensuring feed and water hygiene and conducting regular cage disinfection. Many farmers carried out suboptimal implementation of these biosecurity measures. Additionally, a lack of awareness about FMD control strategies, including disease reporting and coordination with veterinary authorities, posed a significant challenge. FMD was reported to cause substantial economic losses, specifically due to mortality and the sale of infected livestock at reduced prices. The absence of livestock insurance complicated the financial vulnerability of farmers. In conclusion, this study shows the limited knowledge level of farmers in Baring Village about FMD. The prevention practices carried out by the majority are ineffective; many individuals do not implement any measures at all, and disease control is not optimal. The observed challenges suggested the urgent need for enhanced education of farmers, risk communication and policy support to strengthen FMD prevention and control. Comprehensive extension programs and accessible livestock insurance schemes are recommended to mitigate economic and health impacts of future FMD outbreaks.

Keywords | Knowledge, Attitude, Practice, Foot and mouth disease, Farmer, Indonesia

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Foot and Mouth Disease (FMD) is a highly contagious viral disease affecting cloven-hoofed livestock, such as cattle, pigs, sheep and goats. The cause is Aphthovirus from the Picornaviridae family, which consists of seven distinct serotypes, including A, O, C, Asia 1 and SAT 1, 2 and 3 (Mahy, 2005). FMD is characterized by high morbidity rates close to 100% in native populations, although mortality is typically low, except in young livestock (Mee *et al.*, 2021). This significantly affects the livestock industry by reducing milk production, weight gain, fertility and general performance, leading to severe economic consequences, particularly in endemic regions such as Indonesia (Abubakar *et al.*, 2022).

The transmission of FMD occurs through direct contact with infected livestock, contaminated feed and fomites such as farm equipment, human clothing and vehicles. Additionally, airborne transmission is possible over long distances, particularly in humid climates (Purba *et al.*, 2024). Clinical manifestations of FMD include fever, excessive salivation and vesicular lesions on the tongue, lips, gums, interdigital spaces and udder, leading to lameness as well as severe discomfort in affected livestock (Ismail *et al.*, 2023). The presence of the virus in multiple secretions, including saliva, milk, semen and nasal discharge, amplifies the rapid spread, suggesting a need for effective control measures (Sutmoller *et al.*, 2003; Abdul Kabir *et al.*, 2024).

Various control strategies such as vaccination, movement restrictions, culling and biosecurity enforcement are known, but FMD remains a persistent challenge in many developing countries, including Indonesia. According to Zainuddin *et al.* (2023), Indonesia, including South Sulawesi, has experienced recent FMD outbreaks involving genetically identified virus strains, with field reports indicating infection rates of up to 20–30% in some villages based on data from local veterinary services (Zainuddin *et al.*, 2023). Studies showed that inadequate knowledge about disease, along with poor biosecurity practices, could contribute to uncontrolled outbreaks and obstruct eradication efforts (Nyaguthii *et al.*, 2019; Osmani *et al.*, 2021; Nursakilah *et al.*, 2025). Effective risk communication and targeted education campaigns are crucial in bridging these knowledge gaps and improving preventive measures (Blacksell *et al.*, 2019).

Understanding knowledge, attitudes and practices (KAP) of farmers regarding FMD is fundamental to designing and implementing effective disease control programs. Previous studies reported that limited awareness, misconceptions about disease transmission and reluctance to adopt preventive measures contributed to the persistence of FMD in many areas (Sieng *et al.*, 2022). Assessing KAP is

essential to identify barriers to disease control and develop targeted interventions. This research employs a quantitative descriptive methodology via a survey to assess the KAP of farmers on FMD in Baring Village, Pangkajene and Kepulauan Regency, South Sulawesi. The results will contribute to designing effective education programs and policies to enhance FMD control strategies and mitigate the economic effects of the disease.

MATERIALS AND METHODS

This study was conducted in Baring Village, Pangkajene and Islands Regency, South Sulawesi, Indonesia, in 2023. The village spans an area of 37.53 km² and is characterized by a predominantly livestock-based economy. Baring Village was selected purposively due to its recent experience with an FMD outbreak, while surrounding areas had been previously affected.

A cross-sectional descriptive survey design was employed to assess the knowledge, attitudes and practices (KAP) of livestock farmers regarding foot-and-mouth disease (FMD) prevention and control. The study population consisted of farmers owning at least one cloven-hoofed livestock species (cattle, goats, or buffaloes). A total of 52 farmers were selected through purposive sampling, considering feasibility, willingness to participate and representation of the actively farming community. While a formal sample size calculation was not applied, this number is consistent with similar KAP studies in rural and outbreak contexts (e.g., Osmani *et al.*, 2021; who used a sample size of 50 farmers in Afghanistan).

Data collection was carried out between May and June 2023 through face-to-face structured interviews conducted by one veterinarian and two trained veterinary paramedics. During the fieldwork, the research team followed strict biosecurity protocols, including wearing clean, disinfected footwear and clothing before entering each farm; using footbaths and hand sanitizers before and after each interview; ensuring no direct contact with animals; and avoiding visits to multiple farms within a short time period. Prior to participation, all respondents were briefed on the purpose of the study, and verbal consent was obtained. The study protocol was reviewed and approved by the Animal Research Ethics Committee of Universitas Hasanudin (Approval No. 008/UN4.1.RSHUH/B/PP36/2025).

The questionnaire was adapted from previously validated KAP tools on FMD (Osmani *et al.*, 2021) and reviewed for face validity by three field veterinarians. It consisted of both closed- and open-ended questions, divided into three sections (see [Supplementary File](#)): (1) Knowledge (awareness of the cause, clinical signs and transmission routes of FMD); (2) Attitudes (perception of disease risks, trust in

veterinary services and willingness to report); (3) Practices (preventive actions, treatment strategies (traditional and modern) and disease control behaviors). Some questions, particularly those addressing sources of information and types of preventive measures, allowed for multiple responses. The response options were informed by previous studies and field experience with FMD cases in the region. While the questions were closed-ended, interviewers allowed participants to elaborate if necessary. Any responses outside the provided options were documented separately in a comments section. These were later reviewed during data cleaning; if appropriate, they were reclassified into existing categories or noted as “don’t know.” Unique or non-categorized responses were not included in the quantitative analysis but were considered during qualitative reflection on farmers’ perceptions and behaviors.

Data were analyzed descriptively, using Microsoft Excel and SPSS version 25 to calculate frequencies and percentages for all KAP variables. No scoring system was applied, as the purpose was to present a narrative understanding of farmer behaviors and perceptions during the outbreak. This approach was considered appropriate given the exploratory nature of the study and the contextual need for flexibility in interpreting responses from rural communities.

RESULTS AND DISCUSSION

SOURCES OF FMD INFORMATION

The results showed that farmers in Baring Village primarily acquired information about FMD through informal sources. Relatives (39%) and community leaders (33%) were the most common sources of knowledge regarding disease (Table 1). Veterinary professionals, including veterinarians, field officers and paramedics, were consulted by only 10% of respondents. Approximately 14% of farmers relied on livestock traders for disease-related information, while television was cited as a source by only 4%. The heavy reliance on non-professional sources suggests a potential gap in accurate disease awareness. Previous studies showed that inadequate knowledge from informal sources might contribute to the persistence of misconceptions and ineffective control measures (Nyaguthii et al., 2019; Osmani et al., 2021). This signifies the need for structured educational interventions through mass media, veterinary extension services and training programs to enhance FMD awareness (Kiayima et al., 2025).

Relatives being considered the primary source of information about FMD highlights the importance of social networks in shaping community understanding of livestock health issues, since Baring Village was experiencing an outbreak of foot-and-mouth disease (FMD) for the first time and in the village almost all residents have cattle (at least one head), there is limited access to information from

animal health officers, and there are no regular visits from the service veterinarian. Previous studies have shown that informal information sources, including family members and peers, significantly influence farmers’ perceptions and behaviors regarding disease prevention and control (Nyaguthii et al., 2019; Sieng et al., 2022). However, the information received may not be entirely accurate or comprehensive due to a lack of recognition of some clinical signs, including lesions on the gums, nose and udder, as well as misconceptions where 4% of respondents mistakenly believe that FMD is caused by bacteria.

Table 1: Sources of Information about Foot and Mouth Disease Among Livestock Farmers in Baring Village (n = 52).

Source of Information	Frequency	Percentage
Veterinarian, Field officer, Paramedic	5	10
Trader	7	14
Relatives, Neighbors, Friends	21	39
Television	2	4
Society Figures	17	33
Total	52	100

The misunderstandings about disease can be attributed to several factors. First, relevant educational programs are limited in number and scope, leading farmers to rely on general sources unable to provide in-depth explanations. Second, information dissemination through mass media tends to be less effective in communicating crucial details about FMD, such as the differences between viral and bacterial infections and the variations in clinical signs (Young et al., 2014). The information presented may appear extremely general or lack relevance to local conditions. Third, access of farmers to credible information sources such as veterinarians may be limited due to distance, cost, or lack of awareness. Consequently, difficulties are experienced in obtaining clarification about FMD, particularly when there are specific questions requiring answers (Nampanya et al., 2016).

Targeted and integrated efforts are needed to improve the quality and accessibility of information. Strategic use of mass media with more specific and relevant educational content can be an initial step. Direct outreach programs, including livestock health professionals, should be enhanced. Direct outreach allows two-way interaction between farmers and experts. Additionally, using information technology such as applications or online platforms can be an alternative to increase accessibility for farmers in remote areas (Mapiye et al., 2023).

KNOWLEDGE OF ETIOLOGY AND CLINICAL SIGNS

A significant proportion of farmers had a basic understanding of FMD, but large gaps persisted. Even though

50% correctly identified a viral etiology, 46% were unsure and 4% mistakenly attributed the disease to bacterial infection (Table 2). Farmers reported recognizing a variety of clinical signs, including excessive salivation (31%), foot lesions (28%), and vesicles in the mouth (24%). Awareness of vesicular lesions in the mouth (24%), nasal lesions (5%) and under lesions (1%) was significantly low.

Table 2: Knowledge and Awareness of Foot and Mouth Disease Among Livestock Farmers in Baring Village (n = 52).

Category	Response	Fre- quency	Per- centage
Etiology of FMD	Virus	26	50.0
	Bacteria	3	5.8
	Don't know	23	44.2
Recognized Clinical Signs	Excessive salivation	16	30.8
	Lesions on the udder	1	1.9
	Lesions on the gums	6	11.5
	Lesions on the nose	3	5.8
	Lesions on the foot	14	26.9
	Vesicles in the mouth	12	23.1
Known Transmission Routes	Contaminated feed	20	38.5
	Contact with infected animals	17	32.7
	Introduction of new animals	5	9.6
	Equipment, vehicles, or people entering farms	4	7.7
	Don't know	6	11.5
Preventive Measures Known	Keep livestock separated from other herds	15	28.8
	Ensure hygiene of feed and water	10	19.2
	Regularly disinfect the housing area	10	19.2
	Avoid purchasing livestock from risky sources	5	9.6
	Take no preventive action	12	23.1

It is important to note that all respondents were able to identify at least one clinical sign of FMD; therefore, the option “Don’t know” was not included in Table 2. Recognition of clinical signs was variable, with excessive salivation (31%), foot lesions (28%), and vesicles in the mouth (24%) being the most frequently identified symptoms. In this context, excessive salivation (31%) and leg lesions (28%) were the most frequently identified symptoms, similar to the findings of vesicles on the legs and excessive salivation reported in other studies (Chen *et al.*, 2022).

FMD is a highly contagious viral disease that is primarily transmitted through direct contact with infected animals, but indirect transmission, such as airborne transmission, also plays a role (Brown *et al.*, 2022). The knowledge gaps regarding FMD transmission and etiology found in Baring Village (e.g., 46% unsure of viral cause, 4% believing it’s bacterial) were also observed in Cambodia, where many farmers failed to recognize fomites and airborne spread as potential risks (Sieng *et al.*, 2022).

UNDERSTANDING OF TRANSMISSION ROUTES

Understanding transmission routes is crucial for effective disease control. Most respondents (39%) identified contaminated feed as a key transmission pathway, while 32% reported direct contact with infected livestock. However, misconceptions persisted, with only 9% recognizing the role of new livestock introductions and 8% attributing disease spread to fomites such as contaminated equipment and human movement. These results were consistent with previous studies stating that gaps in disease knowledge contributed to poor biosecurity compliance and ineffective outbreak control measures (Blacksell *et al.*, 2019).

PREVENTIVE PRACTICES AND BIOSECURITY MEASURES

Preventive measures varied among farmers, with the most common practices being livestock isolation from other herds (28%), followed by maintaining feed and water hygiene (20%) as well as routine cage disinfection (20%) (Table 2). However, 22% of respondents reported taking no action to prevent FMD, and only 10% avoided purchasing livestock from risky sources. Regarding control measures, 36% recognized the importance of routine veterinary visits, and 28% understood the role of early detection by professionals. Only 12% mentioned the importance of movement control for the infected, 5% recognized the role of authorities in ensuring the health of imported livestock, and 13% did not know FMD control practices. These results show a substantial gap between awareness and action, suggesting the need for enhanced veterinary extension programs, community engagement and policy interventions to improve biosecurity compliance among farmers (Sieng *et al.*, 2022; Ryoo *et al.*, 2024).

CONTROL STRATEGIES AND REPORTING BEHAVIORS

The majority of farmers (35%) choose to treat sick livestock as a primary response to FMD (Table 3). This action reflects the desire to maintain good health and prevent further disease spread. In Western Kazakhstan, approximately 21% of farmers reported treating infected animals with antibiotics (Bayantassova *et al.*, 2023), indicating self-medication practices in the field. Additionally, 24% sell or slaughter infected livestock, potentially increasing transmission risk and causing economic consequences for other farmers. Separating the sick from the healthy population

is another strategy used by 20%, showing awareness of the importance of biosecurity in FMD control. However, only 11% report FMD cases to veterinary authorities, suggesting a lack of active engagement in the livestock disease reporting system. These findings underscore the need to increase awareness and strengthen relationships between farmers and veterinary authorities to ensure timely and effective disease reporting. In Afghanistan, the majority of farmers (74.8%) reported that they would notify authorities if they suspected FMD in their animals (Osmani *et al.*, 2021). The low reporting rate in Kazakhstan suggests significant differences in farmer behavior regarding animal disease reporting.

Approximately 10% of farmers take no action against FMD, which can escalate the risk of disease spread and complicate the effect. These results show the need to enhance the awareness and participation of farmers in FMD control efforts. Providing education on the importance of disease reporting, biosecurity and good livestock health management practices is crucial. In Cambodia, studies have shown that basic biosecurity practices such as quarantine of new animals, isolation of sick animals and FMD vaccination are still poorly implemented by smallholder farmers (Young *et al.*, 2017). This low level of biosecurity may increase the risk of FMD transmission among livestock communities.

The success of foot-and-mouth disease (FMD) control is highly dependent on the collaboration between farmers, village-level animal health officers and village leaders in disease reporting (Sieng *et al.*, 2022). Additionally, support from the government and relevant stakeholders is necessary to assist farmers in overcoming economic and technical challenges related to control processes. These findings are consistent with previous studies, such as those by Osmani *et al.* (2021) in Afghanistan and Sieng *et al.* (2022) in Cambodia, where informal knowledge networks predominated and biosecurity practices were inconsistent (Osmani *et al.*, 2021; Sieng *et al.*, 2022). Likewise, Compston *et al.* (2021) highlighted that in Kenya, economic pressures and poor veterinary access undermined effective FMD prevention, even when awareness existed (Compston *et al.*, 2021). Such parallels suggest that gaps between knowledge and practice are not unique to Indonesia but are shared among smallholder systems in many developing countries.

The implementation of prevention practices was found to be suboptimal. Few farmers routinely maintain the cleanliness of feed and drinking water as well as keep livestock away from other groups. Suboptimal cage disinfection and the purchase of livestock from unclear sources show a gap between knowledge and action, which can be explained by several factors. First, limited resources such as time, labor, or costs are potential constraints. Second, not understand-

ing the importance of biosecurity can lead to underestimating some preventive practices. Third, social and economic barriers such as pressure to buy cheap livestock or lack of community support tend to influence the behavior of farmers (Mulei *et al.*, 2007; Blacksell *et al.*, 2019; Compston *et al.*, 2021; Zainuddin *et al.*, 2023).

A comprehensive method is needed to improve compliance with prevention practices. Intensive outreach concerning the importance of biosecurity and the economic impact of FMD can help change the perceptions of farmers. Practical training on how to implement proper preventive practices is capable of increasing the confidence of farmers. Facilitating access to the necessary facilities and infrastructure has the potential to reduce economic barriers (Ariestanty *et al.*, 2024).

Building collective awareness at the community level about the importance of FMD control is essential and can be achieved through group meetings, open discussions, or public awareness campaigns. Community support will significantly motivate farmers to implement good preventive practices and remind each other during negligence. This method tends to help address social and economic barriers occasionally experienced (MacPhillamy *et al.*, 2022).

Data showed that the majority of respondents (65%) used traditional methods to treat FMD in livestock (Table 3), while 35% had never used traditional treatment methods. This suggests that traditional treatment remains a choice for most farmers in Baring Village. Farmers frequently utilize traditional medicines such as turmeric, herbal remedies, coconut water, ginger, mango, honey, cat's whiskers, Javanese ginger, and chicken eggs. More investigations are needed to identify the specific traditional methods used and their effectiveness, as well as potential risks and benefits. Raj *et al.* (2021) stated that accurate information should be provided about available treatment options, including the advantages and disadvantages (Raj *et al.*, 2021).

ECONOMIC IMPACTS AND LIVESTOCK INSURANCE

Approximately 35% of respondents reported the absence of livestock infected with FMD. This shows FMD is widely experienced by farmers in Baring Village, which can be a basis for further investigation into the impact on livestock businesses and experiences in dealing with disease outbreaks. Data presented that the majority of respondents (21%) reported several cases of livestock deaths due to FMD (Table 3), while 79% had no experience of deaths. Salvarani *et al.* (2025) similarly detect that FMD has caused significant economic losses for farmers in Baring Village, suggesting the urgency to increase prevention and control efforts, including through education, vaccination, and better livestock health management (Salvarani *et al.*, 2025).

The high mortality rate and the sale of infected livestock at low prices show the severe impact of FMD on farmers in Baring Village. Economic losses are not limited to deaths but also include decreased productivity, treatment costs and losses from selling at low prices. This impact can threaten the sustainability of businesses and affect community well-being, specifically when livestock is the primary source of income for families in the village (Ibrahim, 2022).

Table 3: Attitudes and practices of Foot and Mouth Disease Among Livestock Farmers in Baring Village (n = 52).

Category	Response	Frequency	Percentage (percent)
Knowledge of Control Practices	Early detection by veterinary professionals	14	28.0
	Regular visits by veterinary authorities	19	36.0
	Reduce contact between groups	3	6.0
	Control movement of infected animals	6	12.0
	Health checks of imported animals	3	5.0
Current Protective Actions	Don't know	7	13.0
	Report to vet	6	11.5
	Separate sick animals	10	19.2
	Sell/slaughter sick animals	13	25.0
	Provide care/treatment	18	34.6
Experience and Behavior	Do not take action	5	9.6
	Used traditional methods	Yes: 34	65.4
		No: 18	34.6
	FMD-infected livestock experience	Yes: 34	65.4
		No: 18	34.6
	FMD-related livestock deaths	Yes: 11	21.2
Livestock Insurance		No: 41	78.8
	Sold infected animals at low price	Yes: 39	75.0
		No: 13	25.0
	Own livestock insurance	Yes: 4	7.7
		No: 48	92.3

Data showed that 75% of respondents admitted to selling FMD-infected livestock at lower prices (Table 3), while only 25% declared no engagement in practices. Selling the

infected at lower prices is troubling because of the tendency to promote the spread of FMD and threaten the health of other livestock. This suggests the need for stricter interventions to prevent practices, including increasing awareness of farmers about the risks of disease spread and more enforcement of regulations related to livestock trade. The sales potentially driven by economic factors are highly risky due to rapid FMD spread and the complication of control efforts (Yadav *et al.*, 2022). Farmers may be forced to sell sick livestock to avoid greater losses through deaths, but the action harms other colleagues and the community (Nursakilah *et al.*, 2025), suggesting a need for decisive measures to prevent these practices. Strict law enforcement with severe sanctions for offending farmers can have a deterrent effect and prevent others from doing the same. Incentives for farmers who report FMD cases early can facilitate being more responsible and proactive in disease control (Gates *et al.*, 2021).

Table 3 showed that the majority of respondents (92%) lack insurance for livestock, and only 8% have insurance. This signifies the low level of financial protection for farmers against the risk of loss due to disease or livestock death, which is a serious concern considering the high FMD prevalence in Baring Village. There is a need to raise awareness about the benefits of insurance and advise individual participation in available insurance programs. Moreover, the low rate of insurance ownership complicates the economic impact of FMD. Livestock insurance can provide financial protection during livestock death or culling due to disease. Insurance can help farmers reduce the risk of significant financial loss, promoting focus on recovery and disease prevention efforts. However, many may lack understanding of the benefits or have difficulty accessing insurance. There is a need to raise awareness about the benefits and facilitate access to insurance, such as through subsidization programs or collaboration with financial institutions.

The practices adopted by farmers in Baring Village to prevent and control FMD varied widely and were often suboptimal. Approximately 22% of respondents reported taking no preventive action, reflecting a substantial knowledge-to-practice gap. The most common preventive measures were isolation of livestock from other herds (28%), maintaining feed and water hygiene (20%) and routine cage disinfection (20%). However, fewer farmers practiced movement control (12%) or avoided buying livestock from unknown sources (10%), despite these being crucial components of FMD containment (Blacksell *et al.*, 2019).

These findings are consistent with those from Cambodia and Kenya, where farmers' awareness of biosecurity measures was not always translated into action due to economic constraints, lack of infrastructure, and low perceived risk (Compston *et al.*, 2021; Sieng *et al.*, 2022). For example,

economic factors such as the cost of disinfectants or the need to purchase cheap livestock, even from high-risk areas, influenced farmers' decision-making and compromised biosecurity compliance (Yadav *et al.*, 2022). Additionally, social norms and peer practices in rural communities often determine acceptable levels of preventive behavior, meaning individual knowledge may not suffice to change actions unless community-wide practices shift.

Another important observation was that only 11% of respondents reported FMD cases to veterinary authorities, which is a crucial weakness in the passive surveillance system. Gates *et al.* (2021) emphasized that underreporting of animal diseases often results from lack of trust in authorities, fear of culling without compensation, and limited awareness of the importance of disease reporting (Gates *et al.*, 2021).

A critical challenge identified was the low level of veterinary service utilization—only 10% consulted veterinary professionals. This mirrors findings in South Africa and Afghanistan, where poor access to veterinary extension services, especially in remote or underdeveloped areas, limited the adoption of scientifically recommended practices (Osmani *et al.*, 2021; Kiayima *et al.*, 2025).

This study found critical gaps in KAP of farmers regarding FMD in Baring Village, where many had a basic awareness, but misconceptions persisted and preventive measures were often suboptimal. The results showed a need to enhance prevention and control efforts through targeted educational programs, improved veterinary extension services and financial risk mitigation strategies, such as livestock insurance.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, this study shows the limited knowledge level of farmers in Baring Village about FMD, with the majority obtaining information from informal sources such as relatives and community leaders, while only a few consulted veterinary personnel. Although half of farmers are aware that FMD is caused by a virus, there are still misperceptions and uncertainty about the etiology and clinical signs. The prevention practices carried out by the majority are ineffective; many individuals do not implement any measures at all, and disease control is not optimal. The high infection rate (65%) and livestock mortality due to FMD (21%) suggest that disease causes significant economic losses, amplified by low livestock insurance ownership (8%). Therefore, education-based interventions, improving veterinary services, strengthening biosecurity policies and providing livestock insurance schemes are needed to im-

prove the economic resilience of farmers and the effectiveness of control efforts.

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NOVELTY STATEMENTS

This study uniquely highlights the knowledge gaps, attitudes, and suboptimal practices of smallholder farmers during an active FMD outbreak in South Sulawesi, Indonesia. It provides localized insights to inform future FMD control strategies through education, veterinary outreach, and insurance policy development.

AUTHOR'S CONTRIBUTIONS

All the authors contributed to the study design, data collection, data acquisition, analysis and reporting, and manuscript preparation.

SUPPLEMENTARY MATERIAL

There is supplementary material associated with this article. Access the material online at: <https://dx.doi.org/10.17582/journal.jahp/2025/>

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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