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Transmission of Foot and Mouth Disease (FMD) Outbreaks in Lampung Province at May-December 2022

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Abstract

FMD is also known as Foot and Mouth Disease (FMD). This type of disease is caused by a type A virus from the Picornaviridae family, the genus Apthovirus, namely Aphtaee epizootecae. The first clinical symptoms that appear are an increase in body temperature followed by weakness, decreased appetite, when blisters form in the mouth, salivation will increase and is accompanied by the formation of foam around the lips and drooping saliva. This study aims to determine how massive the transmission of FMD is in Lampung Province. This type of research is qualitative descriptive which is a research method that utilizes qualitative data and is described descriptively. This study can be concluded that FMD transmission in Lampung occurred quite massively, the livestock which was confirmed positive consisted of 1,496 cows, 192 kebaru, 299 goats. Based on the results of the last report in December 2022

Keywords: *FMD; Lampung; Transmission*

Introduction

Foot and mouth disease, or often called FMD, is a contagious disease in animals and is very feared by almost all countries in the world, especially livestock and livestock product exporting countries. Indonesia first contracted FMD in 1887 in the Malang area, East Java. FMD is a severe vesicular infection primarily affecting cloven hoofed animals. FMD is known for its ability to infect healthy animals in minimal doses with fast replication and high levels of viral excretion (Alexanderse et al., 2003).

FMD is also known as Foot and Mouth Disease (FMD). This type of disease is caused by a type A virus from the Picornaviridae family, the genus Apthovirus, namely Aphtaee epizootecae. The incubation period of the disease is 1-14 days, namely the time from when the animal becomes infected with the disease until symptoms of the disease appear. This virus can survive for a long time in the environment and survives in bones, glands, milk, and milk products. This morbidity rate can reach 100% and the mortality rate is high in young animals or children. The transmission rate of foot and mouth disease (FMD) is quite high, but the mortality rate is only 1-5%.

According to Harada et al. (2007), FMD is highly contagious to cloven hoofed animals. Transmission has been reported by direct contact with infected animals, aerosols, semen, food products and fomites. The morbidity of this disease is very high but the mortality is low and it is highly contagious (Rushton and Knight-Jones, 2013). FMD is an endemic disease in most parts of the world, such as in the Middle East, Africa, South America and Asia. Information about a country's status against FMD and a list of FMD-free countries can be seen on the World Organization for Animal Health (OIE) website.

Hoofed animals such as cattle, pigs, goats, sheep, buffalo and some wild animals such as deer, antelope and wild boar can also be infected with the FMD virus (Grubman & Baxt 2004; OIE 2012). Although it does not cause high mortality in adult animals, this disease causes clinical symptoms that vary depending on the FMD virus strain that attacks (Grubman & Baxt 2004). The first clinical symptoms that appear are an increase in body temperature followed by weakness, decreased appetite, when blisters form in the mouth, salivation will increase and is accompanied by the formation of foam around the lips and hanging salivary discharge (Jamal & Belsham 2013).

Certain clinical symptoms in even/split hoofed animals that are acute and mass (affecting many animals in one group) should be suspected as a high probability of FMD attacks. The temporary diagnosis of FMD can be made if there are several symptoms, especially in cattle/buffalo, such as:

a. Acute lameness in some animals
b. Hypersalivation, visible hanging saliva, foamy saliva on the floor of the cage
c. Swelling of the submandibular gland Vesicles/blisters and/or erosions around the mouth, tongue, gums, nostrils, skin rashes and nipples
d. Animals lie down more often
e. High fever reaches 410 C
f. A drastic decrease in milk production in dairy cows

Most cows will recover in about 2 weeks. During this time, healing of the tongue or foot lesions will occur within 30 days after infection and these are usually clearly detectable on post mortem examination. Antibodies that begin to develop after 5-14 days will eliminate FMD virus in blood and tissues, so that the probability of the virus in the carcass is low.

Figure1.Hypersalivation

Figure 2.Wounds on Cattle Scratches

FMD Transmission Method

Broadly speaking, the spread or transmission of the disease occurs horizontally or vertically. Horizontal transmission of the disease means that there is a transfer of disease from one animal to another in one generation, for example transmission of the influenza virus from one horse to another in one stable. Meanwhile, vertical transmission means that there is a transfer of disease from one generation to the next, for example, there is transmission of disease to embryos or fetuses while in the uterus, or through eggs to birds, reptiles or fish. Transmission that occurs from mother to child through milk is also categorized as vertical transmission (Triakoso, N., 2009).

Horizontal transmission can occur directly or indirectly. Direct transmission can occur by contact of infected animals with infected animals without intermediaries. While indirect transmission through intermediaries such as objects or living things. These agents are generally known as vectors. Transmission of infectious agents through the air (airborne transmission) that occurs at long distances is also classified as indirect transmission (Triakoso, N., 2009). Transmission of FMD is through inhalation, can be spread through wind, traffic of food ingredients, livestock, vaccines contaminated with the FMD virus, and through reproduction (Budi, S.R., 2019).

FMD Clinical Symptoms

FMD transmission through blister fluid, inhalation, breast milk, direct contact with infected animals, excretions, cement and cage equipment. Clinical symptoms, seen generally fever temperature of 41 degrees Celsius, lethargy, hypersalivation, anorexia, reluctance to stand up, decreased body weight, decreased milk production. While looking specifically at the blisters in the form of round protrusions filled with lymph fluid on the tongue, inner lips and gums. Primary blisters begin to appear 1-5 days after infection as well as sores on the feet. Post mortem abnormalities of blistering and erosion seen in the rumen, reticulum, omasum. In calves, goats, buffaloes and pigs, abnormalities in the heart are often found in the form of yellow-gray nests that have lines depicting the Republic of Indonesia's (Gelolodo, M. A., 2017).

Diagnosis FMD

There are several tests used to detect FMD, be it virus isolation, serology or molecular PCR (Grubman & Baxt 2004; OIE 2012). Compared to virus isolation, molecular detection can be done more quickly and can reduce the risk of spreading the virus due to errors that occur in the laboratory. This is because sample extraction in the PCR test uses detergent-based reagents which will inactivate the virus. Compared to virus isolation, PCR is more expensive and requires positive control for each test. FMD is a strategic animal disease and is still declared free in Indonesia, procuring positive controls is an obstacle

because they have to import antigens from abroad. Synthetic positive controls have been used and developed for several disease trials (Caasi et al. 2013).

FMD has a big influence on Lampung Province. Lampung Province has a fairly high role in fulfilling national food. Statistical data from the Livestock and Animal Health Service states that the population of beef cattle in Lampung Province in 2020 was recorded at 857,364 heads, which is the second largest population on the island of Sumatra with a contribution of 4.9% to the national cattle population which was recorded at 17,440,393 heads. (Livestock and Animal Health Service of Lampung Province, 2022). The outbreak of FMD in Lampung Province has caused the price of fresh meat in other provinces to be unstable, this is because suppliers of fresh meat or live livestock in other provinces come from Lampung Province.

Lampung Province is one of the cattle producing centers in Indonesia, this is because Lampung Province has a large population of cattle. The following is data from the Central Statistics Agency regarding the cattle population by district in Lampung Province in 2019-2021:

Table 1. Cattle Population

Region	2019	2020	2021
Bandar Lampung	1 121.00	1 064.00	1 080.00
West Lampung	7 655.00	7 416.00	7 510.00
South Lampung	146 323.00	119 170.00	124 089.00
Central Lampung	364 338.00	342 050.00	367 692.00
East Lampung	149 300.00	151 510.00	164 726.00
North Lampung	31 064.00	32 022.00	32 502.00
Mesuji	8 862.00	9 292.00	9 525.00
Metro	9 902.00	11 704.00	11 922.00
Pesawaran	21 255.00	20 446.00	21 625.00
Pesisir Barat	9 556.00	9 761.00	9 956.00
Pringsewu	13 138.00	15 073.00	16 000.00
Tanggamus	8 729.00	6 452.00	6 475.00
Tulang Bawang	22 148.00	22 683.00	27 219.00
Tulang Bawang Barat	20 333.00	22 710.00	23 315.00
Way Right	37 831.00	38 092.00	38 352.00

Source: Livestock and Animal Health Service of Lampung Province

Methods Research

This type of research isqualitative descriptive which is a research method that utilizes qualitative data and is described descriptively. The purpose of this study is to describe cases of FMD outbreaks in

Lampung Province.The research location is in Lampung Province. The research lasted for 6 months, from June to December 2022. Data sources in the qualitative research were obtained from case reports of FMD outbreaks from the Livestock and Animal Health Service of Lampung Province, and the FMD Alert Team. Data collection in this study was carried out through observation and interviews, both structured and unstructured, documentation, visual materials and information recording. In this study the data collection techniques used were observation, interviews and document studies

Results and Discussion

Based on the results of interviews with informants, it is known that FMD transmission in Lampung is massive, FMD outbreaks attack various types of livestock including cattle, buffalo, goats and sheep. The first time a positive FMD case was confirmed was in Tulang Bawang Regency, which in the end was followed by other districts and cities. In the transmission of FMD outbreaks, the environment plays a very important role when there is a surge in FMD infections. This can happen because FMD transmission can occur directly or indirectly.

FMD transmission is direct, namely from sick livestock to healthy livestock that experience direct contact. While indirect transmission can be through feed, cage equipment and cage workers or inseminator officers. The results of the data obtained from the Livestock and Animal Health Service in Lampung Province were submitted by drh. Marta the P3H sub coordinator who was interviewed on November 9, 2022 who explained the transmission of FMD in Lampung Province as follows:

Foot and Mouth Disease or FMD was confirmed positive for the first time in Lampung Province, namely on May 12 2022, two districts which were confirmed positive for the first time after carrying out PCR tests on cattle suspected of having FMD based on clinical symptoms that appeared were in Tulang Bawang Barat and Mesuji districts. In the same month, namely in May 2022, two more districts were confirmed positive, namely on May 17, 2022 in Tulang Bawang Regency and May 23, 2022 in East Lampung Regency. So for one month, namely in May 2022, there were 4 districts that were confirmed positively infected with the FMD outbreak in Lampung Province.

In the following month, June 2022, following three other regencies which were confirmed positively infected by the FMD outbreak, namely Pesawaran Regency on June 13 2022, North Lampung Regency on June 14 2022, and Metro City on June 22 2022. Meanwhile in July it increased again three districts that were confirmed positive, namely South Lampung Regency on July 16 2022, Way Kanan Regency on July 20 2022 and Bandar Lampung City on July 22 2022. August 2022 was the last month for positive confirmation of FMD outbreak cases in new areas. There are two districts that have just confirmed positive, Central Lampung Regency on August 1, 2022 and West Coast District on August 23, 2022.

Based on information obtained from the Livestock and Animal Health Service of Lampung Province, the spread of FMD outbreaks occurred in 67 villages in 38 sub-districts and 12 districts/cities with a morbidity rate of 1987 livestock that were confirmed positive for FMD. Of the 1987 livestock that were confirmed positive, there were 1,496 cows, 192 goats, and 299 goats. Based on the results of the latest report in December 2022, out of 1987 cattle that were confirmed positive for FMD, 1856 had been declared cured of FMD disease, while 41 of the other 132 animals had died and 91 had been forcibly slaughtered.

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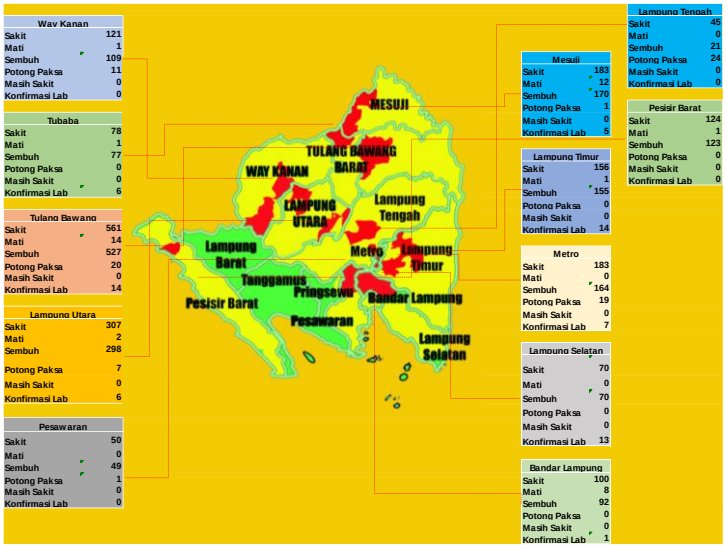

Figure 1. FMD Distribution Map

The first time a positive FMD case was confirmed was in Tulang Bawang Regency, which in the end was followed by other districts and cities. In the transmission of FMD outbreaks, the environment plays a very important role when there is a surge in FMD infections. This can happen because FMD transmission can occur directly or indirectly.

Table 2. FMD Cases in Districts/Cities of Lampung Province

No.	Region	First Time PMK Possitive	Subdistrict	Village
1	Tulang Bawang Barat	12 May 2022	Gunung Agung	Mulya Jaya
2	Mesuji	12 May 2022	Way Serdang	Hadi Mulyo
3	Tulang Bawang	17 May 2022	Banjar Agung	Warga Indah Jaya
4	East Lampung	23 May 2022	Batang Hari	Batang Harjo
			Sukadana	Bumi Ayu
5	Pesawaran	13 June 2022	Negeri Katon	Halang Ratu
6	North Lampung	14 June 2022	Abung Selatan	Abung Jaya
7	Metro	22 June 2022	Metro Selatan	Rejo Mulyo
				Sumber Sari
8	South Lampung	16 July 2022	JAti Agung	Marga Kaya
9	Way Kanan	20 July 2022	Baradatu	Bakti Negara
10	Bandar Lampung	22 July 2022	Langkapura	Gunung Terang
11	Central Lampung	1 August 2022	Seputih Seagung	Gayau Sakti
12	Pesisir Barat	23 August2022	Pesisir Utara	Padang Rindu
				Walur

FMD transmission occurs directly due to direct contact with sick animals, contact with saliva and nasal discharge, and materials contaminated with the FMD virus, as well as carrier animals. While indirect transmission occurs due to contact with materials/equipment contaminated with the FMD virus, such as officers, vehicles, animal feed, livestock products in the form of milk, meat, viscera, bones, blood, semen, embryos and feces from sick animals. FMD transmission from one area to another generally

occurs through the movement or transportation of infected livestock, products from infected livestock and carrier animals or animals carrying the infective virus in the body.

The massive transmission of FMD outbreaks in Lampung province can be influenced by several factors including:

1. The application of biosecurity is still not optimal because it is influenced by the community's habitual system of raising livestock extensively in several districts which has a great opportunity for FMD transmission due to contact between healthy livestock and sick livestock.
2. Treatment has not been achieved evenly due to the limited number of available drugs, given that the livestock population in Lampung province is quite large, which is more than 800,000 cattle.
3. The implementation of the vaccination program is not optimal because it is caused by several factors including, the limited number of human resources with a disproportionate ratio when compared to the number of livestock with existing officers, livestock rearing systems in several districts using the herding method make it difficult for officers to carry out vaccinations, and also there are resistance vaccination by some people.

Forced slaughter programs that have not run optimally because of the large costs incurred as compensation to breeders.

Conclusion

FMD transmission in Lampung occurred quite massively. Based on information obtained from the Livestock and Animal Health Service of Lampung Province, the spread of FMD outbreaks occurred in 67 villages in 38 sub-districts and 12 districts/cities with a morbidity rate of 1987 livestock that were confirmed positive for FMD. Of the 1987 livestock that were confirmed positive, there were 1,496 cows, 192 goats, and 299 goats. Based on the results of the latest report in December 2022, of the 1987 cattle that were confirmed positive for FMD, 1856 of them had been declared cured of FMD, while 41 of the other 132 animals had died and 91 had been forcibly slaughtered.

Conflict of Interests

The author declares that no conflict of interest exists in this publication.

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