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Recommended Citation

Frederick, H. J., "Circular No. 51 - Foot-and-Mouth Disease" (1924). *UAES Circulars*. Paper 47.

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UTAH AGRICULTURAL COLLEGE
UTAH AGRICULTURAL EXPERIMENT STATION

FOOT-AND-MOUTH DISEASE

By

H. J. FREDERICK

The following is printed that the seriousness of the foot-and-mouth disease outbreak might be apparent to the farmers and ranchmen of Utah, that the importance of the quarantine regulations might be emphasized, that precautionary methods might be adopted by each individual concerned, that the disease might be recognized should it occur, and that each stock man of the state might see the importance of immediately reporting to the State Veterinarian or to a veterinarian in his locality or to the Utah Agricultural Experiment Station.

Foot-and-mouth disease is a contagious disorder of cloven-hoofed animals affecting the mouth, tongue, lips, feet, legs, and udder. The disease is due to an ultra-microscopic organism and is characterized by the formation of vesicles of the mucous membrane and skin. The discharges of the mouth and feet contain the contagion. This virus is scattered along the roads in the stables, feed lots, and pastures and is conveyed from field to field by small vermin, dogs, cats, chickens, pigeons, etc. Raw milk may also transmit the disease to human beings or animals fed with it.

History and Occurrence.—Foot-and-mouth disease has been somewhat prevalent in Europe since 1839 and has occasioned a tremendous loss. It has gained such a foothold that it is almost impossible to exterminate it, as has been done in the United States; hence, the frequent outbreaks in different parts of Europe. The disease is also reported from Asia and Africa. It is common in South America.

Foot-and-mouth disease has been an occasional visitor to the United States since 1870. Six different outbreaks have occurred, and the seventh (the latest invasion) occurred in California

about February 20, 1924. The disease is supposed to have originated in Solano County, California, thru the feeding of garbage to hogs, from a steamer arriving from a foreign port. In most European countries foot-and-mouth disease has gained such a foothold that it has probably become a permanent infection. Great Britain has fought off many outbreaks and is now engaged in one of the hardest fights to protect its livestock from the scourge.

The United States has succeeded in eradicating five previous outbreaks before they spread to any great extent. The worst outbreak occurred in 1914, gaining considerable headway before being recognized. It took one and a half years of strenuous effort to stamp it out. Twenty-two states and the District of Columbia were affected. Three thousand and twenty-one herds and 2707 premises, about 77,000 cattle, 85,000 swine, and 10,000 sheep (including goats and deer) were slaughtered. This cost the Federal government and the states sharing the expense cooperatively approximately \$9,000,000.

Symptoms.—The disease makes its appearance in from three to seven days after the exposure of the animal, altho it may be longer. The first evidence of the disease is usually a rise of temperature, reaching 106° F. and lasting one or two days and then falling to normal (101.5° F.) as soon as vesicles appear. Unless secondary infections or complications arise no further rise in temperature occurs during the course of the disease.

With the fever there is a period of loss of appetite, suppressed rumination, and exhaustion followed by development of vesicles on the muzzle and inside the lips, mouth, and tongue. These are about the size of hemp seeds or peas to that of walnuts. In a short time these rupture and leave deeply reddened sensitive open sores of an irregular area. The irritation causes saliva to drool from the mouth and a peculiar sucking sound with the lips and tongue is produced. The mouth symptoms are the most characteristic and may be present without foot lesions. In other cases, in a day or two after the mouth symptoms, similar eruptions may make their appearance between the digits and at the cornet. Lameness in the feet often becomes so severe that when the vesicles break sloughing occurs. Sometimes the hoofs drop off and the joints are opened and excessive sloughing takes place. The greatest damage to feet is among sheep and hogs. They often rest on their knees to relieve the pain in the feet. They often lie down most of the time, and when they arise it is with difficulty.

After the rupture of the vesicles the grayish-white membrane forming the blister may remain attached for a day or more or disappear quickly leaving deeply reddened sensitive spots or ulcers in the mouth and on the cornets as well as between the claws. Such erosions may be noticed on the teats of milk cows. The foot attacks often show themselves on all four feet at the same time, yet in some animals one or more of the feet escape during the entire course of the disease. The contents of the vesicles are clear or yellowish and contain the infective material.

When the disease has become fully established the duration of the attack will vary greatly with different animals. It usually requires from ten to twenty days for the recovery of a normal appetite and spirits in mild outbreaks. In the malignant type of the disease it requires from three months to a year for an animal to recover. However, many die—about 1 per cent in the benign type and 50 per cent in the malignant type.

The causative factor of this disease is taken up by the digestive tract with food, water, bedding, litter, etc. which has become infected principally by the saliva and foot discharges of affected animals. Such agents as stable utensils, mangers, watering troughs, clothing, and the hands and shoes of the attendants may harbor the virus. Stock yards, railway cars, cattle pens, manure, and hides may also carry the contagion. Hay, straw, feed, etc. imported from infected districts often spread the disease.

Diagnosis.—In typical cases during the vesicular stage of the eruption the diagnosis is not difficult. The affection is characterized by the finding of the vesicles, the foot lesions, the rapid spread of the contagion, and the ease with which it may be transmitted artificially. Foot-and-mouth disease may be confused with various forms of stomatitis in animals, none of which are very contagious.

Tromatic stomatitis is caused by sharp irregular teeth and irritant medicines. There are no vesicles present and the wounds have a sharp border.

Mycotic stomatitis which is very common is due to a fungus or mold. The ulcers are deeper in tissues and it is non-contagious and affects neither sheep nor swine. At the most no more than 50 per cent of animals are affected.

Vesicular stomatitis of horses and cattle affects the mouth but not the feet. Horses are affected with this but not with the foot-and-mouth disease. Hogs and sheep do not have **Vesicular stomatitis**.

Necrotic stomatitis (calf diphtheria or sore-mouth in pigs) is detected by yellowish-gray spots or patches which develop on the mouth, cheeks, and tongues. It is caused by **Necrosis bacillus**. Lip and leg ulceration (**necrobacillosis**) is also caused by **Necrosis bacillus**.

Other diseases sometimes mistaken for foot-and-mouth disease are (1) foot-rot in sheep and cattle where no vesicles appear and where the disease spreads slowly thru the flock; (2) ergotism which is not contagious and which is not accompanied by blisters; and (3) cow and horse pox which forms pustules.

In all of these diseases the percentage of animals infected in a herd of cattle, sheep, or swine, and the history of the exposure without transmission of the disease except by immediate contact would indicate that the ailment is not foot-and-mouth disease. When foot-and-mouth disease is introduced practically all (if not all) cattle and hogs as well as sheep in the locality are affected.

Treatment.—In the United States no treatment is tolerated. The extreme contagion of the disease and its rapid spread justify the radical measures of extermination. Immediate slaughter of all affected animals and proper disposition of carcasses (either by cremation or by deep burial at least six feet and covered with air-slacked lime) as well as a thoro disinfection of premises are recommended.

The present outlook for controlling foot-and-mouth disease in California is rather favorable, but it cannot be definitely predicted. The experience of former outbreaks has been valuable in facilitating the work of this outbreak that had to be done in California. The state and government are working harmoniously, cooperating to eradicate this disease. Whole-hearted cooperation of the stockmen and various organizations with the public in general in the infested area is making it possible for the efficient Federal and State forces to eliminate this scourge in record time.

All the intermountain states, including Utah, have adopted uniform quarantine regulations covering the movement of live-stock and other commodities from California. Nothing can be shipped or brought into this state from California unless it is accompanied by a certificate of inspection from Federal or California State Inspectors. Even persons and vehicles are properly fumigated before entering the state.