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FOOT AND MOUTH DISEASE

BY

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FOOT AND MOUTH DISEASE.

Canadian stock owners and veterinarians have been fortunate in that hitherto they have had little need for knowledge of Foot and Mouth Disease. Its recent appearance in New England however, has suggested the advisability of issuing a brief bulletin giving a general description of the disease in question, its symptoms and treatment and the various channels through which it spreads.

This malady has many other names as Eczema Epizootica, Epizootic Aphtha, Aphthous Fever, etc., but it is now commonly known in English speaking countries as Foot and Mouth Disease, owing to the fact that its specific effects are, as a rule, more readily observable in connection with the feet and mouth than elsewhere, although the skin and mucous membranes generally are also affected.

There is conclusive evidence of the existence of this disease in Europe before the middle of the eighteenth century.

It first appeared in Britain, so far as is certainly known, in 1839 and from that date until a very few years ago, it was one of the most persistent scourges of the herds and flocks of the mother country. For eight or nine years back however, it has been kept under control, and although it has been introduced several times, it has never been permitted to extend its ravages.

It was first observed in Canada in August, 1870, having been introduced by cattle landed at Montreal. A number of herds in Quebec, Ontario and the North-eastern States became involved but the infection did not survive the winter.

In 1875 it appeared near Toronto in some imported sheep, and although it spread to some extent, it was stamped out through the well directed efforts of Professor Smith who, however, attributes his success largely to the advent of cold weather.

In 1884 a slight outbreak occurred in cattle landed at the quarantine station at Point Levis, but the prompt measures adopted by my predecessor prevented its obtaining a foothold in the country.

The exact nature of the germ to which Foot and Mouth Disease owes its existence is not yet definitely decided. It is not of a fatal nature, the rate of mortality, in ordinary outbreaks, seldom exceeding one or two per cent of the adult animals affected. It causes however great financial loss to stock owners through shrinkage of flesh, milk and general condition, while abortion in pregnant animals is very common, and in severe cases troublesome complications are liable to persist long after the disease itself has run its course in the herd.

Originally it appears to be a disease of cattle, but it is easily transmissible to sheep, swine and poultry as also in a less degree to horses, dogs, cats and other animals, while man himself is by no means immune. It is, without doubt, one of the most infectious diseases known and the many different ways in which its germs are conveyed from place to place, render it very difficult to prevent its spread once it has made its appearance in a community.

As all the natural discharges of an affected animal are highly infective and as some of them, particularly the saliva, are largely increased during the attack, the disease is readily conveyed to other animals by these media.

Fodder of every kind, including grass, readily becomes infected and when eaten by healthy animals will, in the majority of cases, produce the disease, while water is a frequent agent in its transmission. Halters, blankets, brushes, brooms, and pails are all sources of danger as is also the manure from infected animals. The disease has frequently been conveyed from farm to farm through the clothing of attendants and others and by the feet not only of affected animals which, especially in the secondary stages of

the attack, are exceedingly active agents in the dissemination of the infection, but of men, dogs, birds and other creatures.

The period of latency may extend from twenty-four hours to as many days, but once introduced in a herd the disease will generally develop within a week.

SYMPTOMS.

The first symptoms shown by an affected animal are shivering, staring coat, arching of the back, stiffness, especially when the feet are involved, and loss of appetite. The sufferer will leave the herd and there is a tendency to seek shelter and warmth. There is always a decided rise of temperature which may reach 105° or 106°, although this may be unaccompanied by a corresponding increase in the pulse rate. Constipation is generally present and the action of the kidneys is likely to be irregular. Mucous discharges from the eyes and nose are often present and, especially in cold weather, there may be more or less coughing.

The premonitory symptoms as given above are shortly followed by the more definite local phenomena which characterize the disease. Among these one of the first to be noticed in cattle is a peculiar smacking of the lips, accompanied by a profuse discharge of frothy saliva. This symptom is soon followed by the eruption in the mouth of the characteristic vesicles of the disease. These are generally first observed on the dental pad, one or more at each angle, seldom in the middle, although they may subsequently coalesce. They are soft, fluctuating and unaccompanied by any inflammation of the surrounding tissues, which are in fact generally somewhat paler than the rest of the mucous membranes. These are followed by similar though somewhat larger vesicles or blisters on the upper surface of the tongue. On this organ although large in size, they are seldom numerous. Owing to the density of the mucous membrane they do not break readily and may under run and unite forming eventually large and very painful sores. Vesicles are frequently seen on the membrane lining the cheeks and palate as also on that of the lower lip and occasionally on the muzzle. If these vesicles are not accidentally ruptured by the attempts of the patient to eat hard or coarse food, they burst spontaneously on reaching maturity. They contain in the early stages a yellowish lymph-like fluid which however becomes gradually more opaque. They leave raw, red and painful erosions which sometimes, persist for a considerable time, especially if irritated, as unhealthy ulcers, but which under favourable conditions, heal naturally although always somewhat slowly.

The saliva which in the early stages is thin and frothy, gradually becomes thicker and hangs in ropes from the mouth infecting, especially after the vesicles rupture, everything with which it comes in contact.

A second crop of vesicles is occasionally thrown out. These are less in area but deeper and accompanied by more inflammation of the surrounding tissues.

In cows the udder often becomes affected, the lesions on that organ particularly in deep milkers or newly calved cows, being very serious and extensive. More or less inflammation is always evident, followed in a few hours by the development, usually on the teats, of the characteristic vesicular eruption. If left undisturbed, the vesicles generally burst within twenty-four or thirty hours of their appearance, although they sometimes dry up and scale off, their contents becoming absorbed. As a rule however, they leave raw, purulent sores which, if irritated by the hands of the milker or otherwise, are very apt to run together, sometimes extending over and blocking up the opening of the teat, causing congestion and possibly inflammation of the quarter affected. Secondary vesicles not unfrequently appear on the udder. The function of this organ, which is always more or less impaired in animals giving milk, is of course seriously interfered with and may be altogether suspended upon the development of the local lesions above described. The milk in almost all cases is unfit for use. It not only becomes thick, yellow and offensive but it is exceedingly fatal to young animals, causing death very suddenly, either from acute inflammation of the stomach and bowels, or by direct toxic action. In the human species it is highly dangerous to infants, and even in adults, it will in some cases transmit the disease, while in others it will produce

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serious gastric and intestinal disturbance. It may be rendered harmless by boiling or by the addition of salicylic acid, but even when so treated cannot be recommended as an article of diet.

In some outbreaks the external generative organs, both male and female, show the characteristic lesions of the disease, giving rise to much irritation and occasionally to severe inflammatory changes.

Some authorities state that the disease at times affects the base of the horns causing loosening and sometimes loss of these appendages, but this is of rare occurrence.

There is however no doubt that the skin, as a whole, is more or less affected in every instance although, save in exceptionally severe cases, the lesions are apparent only on the thinner and more delicate portions.

Foot lesions in cattle are first indicated by lameness generally, though not invariably, sudden in its onset. This may affect one foot or it may involve them all. In the latter case motion is of course exceedingly painful and difficult, especially on hard or stony ground or among stubble. The animal will frequently, in the early stages, be seen to shake the affected foot or feet, as if a stone or other foreign body were lodged between the digits.

As the pain in the feet, especially if all are involved, becomes more severe the suffering animal will lie almost constantly and while in this position will drag itself about in order to feed, rather than attempt to rise and walk. In mild cases, relief is evidently obtained by standing in water or in cool wet marshy spots. On examination, pain, heat and swelling will be detected round the coronet while, in white or light colored cattle, redness of the part is also present.

Within twenty-four hours, as a rule, from the first appearance of lameness, the vesicles or blisters characteristic of the disease may be observed. These in cattle are generally confined to the hairless tissue about the junction of the digits although they may, and frequently do, occur high up in the heel near the small horny excrescences in that region.

A few hours after their appearance these vesicles burst, discharging a clear yellowish fluid and leaving bright red, angry sores showing ragged, whitish edges. These sores ordinarily heal rapidly, seldom leaving any scar or other bad result. Occasionally however, more especially when affected animals have been driven some distance, a severe inflammatory action takes place, giving rise to serious local complications such as shedding of the hoof, inflammation of the coronet or of the delicate internal structures of the foot, open joint or even gangrene (mortification) of a portion or the whole of the extremity.

In sheep the disease is generally confined to the feet, only a small percentage of these animals presenting mouth lesions which, when they do appear, resemble closely those already described in the case of cattle. The feet of sheep however are usually affected in a manner somewhat different from those of the larger animals. The vesicles are more frequently situated at the heels or directly on the coronet, than at the openings of the inter-digital space, their favorite seat in the bovine species. Owing to this circumstance a gradual casting and renewal of the hoof is a not uncommon sequel of the disease in sheep. When this occurs, the new hoof, slowly growing downward from the coronet, displaces the old one which however is not cast off until its successor is almost fully developed.

In the pig the mouth symptoms are slightly different from those shown by cattle and sheep, inasmuch as the vesicles are generally more in evidence on the snout and lips than on the tongue and inside the cheeks. The mammary glands are frequently involved. Except for a more acute and exceedingly painful laminitis accompanied by a tendency to the abrupt shedding of the hoof, the foot lesions of the pig are almost identical with those of the sheep.

TREATMENT.

The constitutional treatment in ordinary cases is very simple. It is generally advisable to move the bowels slightly, for which purpose a moderate dose of Epsom salts will

be found most suitable. Should the temperature remain elevated, a few doses of nitrate of potash or hyposulphite of soda may be easily administered in the drinking water. Complications must be specially dealt with as they appear. In lingering cases or where great weakness supervenes, benefit will result from the judicious use of ale or stout combined with vegetable tonics. The food supplied should in all cases be soft and easily masticated, as gruel, mash, green grass, steamed hay, ensilage, etc. If roots are given they should be pulped. Careful attention to this phase of the treatment is demanded.

Local treatment is also simple. The vesicles should under no circumstances be intentionally ruptured, but must be allowed to burst of themselves, after which they may be dressed several times a day with a solution of alum, borax, iron sulphate or salicylate of soda, to which may be added a few drops of creolin or carbolic acid. Where unhealthy sores or ulcers occur extending into the deeper tissues, the careful application of a mild caustic may be necessary. The feet should be kept as clean as possible. The sores resulting from rupture of the vesicles may be dressed with the agents mentioned above as suitable for the mouth, although in some cases they may be used in stronger solution. For this purpose foot baths are useful more especially as many affected animals like to stand in water or moist places.

A convenient mode of dressing the feet when animals are affected in large numbers is to drive them, once or twice a day, through shallow troughs containing the solution which it is desired to apply.

The udder when involved should be carefully handled; to prevent irritation from the hands of the milker it is advisable to use a teat siphon.

The foregoing is a brief summary of the methods hitherto in vogue, but within the last eighteen months an important discovery has been made by Professor Baccelli, a noted Italian pathologist, which, it is claimed, will revolutionize the treatment of Foot and Mouth disease.

Professor Baccelli's method consists in the injection of a solution of corrosive sublimate into the veins of affected animals.

The dose for an adult of the bovine species is about one grain. It is administered in combination with common salt solution. Its effects are said to be marvellous.

If administered before the development of clinical symptoms, the progress of the disease is at once arrested, the only noticeable feature being a slight elevation of temperature.

In the more advanced stages of the attack the results are said to be even more striking, the temperature being almost immediately lowered, while the ulcers assume a healthy aspect, the appetite returns, lameness disappears and no secondary lesions occur. Even in the worst and most severely complicated cases, it is claimed that this simple remedy will check the disease and save the lives of the animals.

There has fortunately been no opportunity for this Department to test the truth of these statements, but as they are made on excellent authority, it will be well to bear them in mind should the disease ever make its appearance in the Dominion.

PREVENTIVE MEASURES.

Once the disease is recognized, every possible effort should be made to prevent its spread. This, owing to the ease with which the infection is disseminated, is a matter of very great difficulty.

All movement of animals should be immediately stopped and those affected isolated at once. If the outbreak is small and localized, slaughter may be advisable, especially as the flesh of animals affected with the disease in its ordinary form may be used with impunity.

In any case the most stringent precautions should be adopted to prevent the conveyance of the contagion to other premises or to animals not yet affected. Bedding, manure and rejected fodder should be burned or failing this, thoroughly mixed with fresh lime, carefully guarded and buried or ploughed in as soon as possible. Carcasses of animals dead of the disease should be burned and their hides or wool, if removed, carefully disinfected, this latter precaution of course applying also to the hides or wool

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of animals slaughtered. All clothing, halters and stable utensils are active infective media and should either be burned or carefully disinfected.

Buildings, fences and other fixtures should be treated with hot steam or boiling water before being coated with lime wash containing a liberal allowance of chloride of lime, creolin or crude carbolic acid. Infected or suspected stock cars and yards, as also ships or boats which have conveyed diseased animals, should be dealt with in a similar manner.

The disease is frequently conveyed from place to place by human agency. Attendants, owners, interested neighbors, veterinary surgeons and inspectors should all exercise the greatest care in the disinfection of clothing, hands, boots, instruments, etc., after being among or in proximity to affected animals.

Dogs are very liable to convey the disease to or from neighbouring farms and should be closely confined when it is known to exist in any district.

Foot and Mouth Disease generally runs its course in from two to three weeks, but the contagion may retain its activity under favourable circumstances for a long time. Stables have been known to remain infective for twelve months, while in one case, troughs lying in an open field infected cattle after four months. One attack confers immunity for about five months but animals readily become re-infected in subsequent outbreaks. Inoculation with a mixture of the blood of animals recently recovered and the lymph from active vesicles is said to convey similar immunity without producing the disease in an acute form. Ordinary inoculation is frequently resorted to in order that the duration of an outbreak may be curtailed by having all the animals in a herd affected at the same time.

Should the disease unfortunately appear in Canada no time should be lost in communicating the fact to the Department of Agriculture at Ottawa. Under the provisions of the Animal Contagious Diseases Act, persons concealing its existence are liable to a penalty of two hundred dollars.

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Chief Veterinary Inspector.

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