

Johne's Disease of Cattle

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JOHNE'S DISEASE OF CATTLE

Although this disease is not prevalent in Canada, this pamphlet has been prepared with a view to giving cattle breeders and owners the available information to assist them to recognize or suspect it when it does occur, and so enable them to guard their interests by taking prompt measures to control the disease, and to prevent its spread. Much depends upon the alertness of the live stock owner in detecting disease, his promptitude in isolating affected animals and reporting to the authorities, as to whether the infection is quickly controlled or a serious outbreak develops.

HISTORY

Johne's disease was so named after the scientist Johne, who, with his co-worker Frothingham, discovered the microbe which produces this disease in 1895. The disease, however, had been observed in Europe much earlier, as the peculiar changes which it produces in the intestines were described nearly one hundred years ago. It was not, however, definitely recognized in Great Britain until 1906. It has since been reported on this continent, and cases have been confirmed in Canada. With improved and greater facilities for the transportation of cattle throughout the world, the disease is undoubtedly spreading nationally and internationally. While it has been recognized in this Dominion it is believed to be of rare occurrence, and the extent of its spread is unknown.

NATURE OF THE DISEASE

Johne's disease is a malady particularly affecting cattle with lowered resistance, irrespective of breed. It is a chronic infectious disease, and it can only occur as the result of a pre-existing case. Bad management and care, improper feeding and over production will seriously lower the resisting powers of an animal, but cannot produce this disease. It is necessary for the specific microbes to gain entrance into the body of the animal before Johne's disease can develop.

Health, disease, or death, from a technical viewpoint, is in reality the result of a struggle for victory between the resisting forces inherent in the individual body and the disease-producing germs which invade it.

When an animal, maintained under conditions which lower its resisting powers to disease, comes in contact with this infection, the germs are able to multiply in its body and to increase their activities to such an extent that the normal functions of the tissues in which they are located are deranged and disease results. When, however, the germs gain entrance to the body of an animal with high resisting powers they are destroyed by the body cells and disease cannot then develop.

This particular microbe is an organism of very low virulence, and the disease which it produces progresses very slowly and develops in a very insidious manner. Months and years may pass before the animal shows noticeable signs of illness.

SYMPTOMS

Infection may occur during calthood, but symptoms have not been observed in animals under eighteen months of age, and rarely before they are two years old. Symptoms are usually first observed after calving, at a time

when the animal's resisting powers are at a low ebb. They are more frequently seen in animals ranging from two and a half to six years of age, and occasionally in older animals.

The characteristic symptom of this disease is a diarrhoea, and until it occurs little change can be detected in the appearance and behaviour of the animal.

The attacks of diarrhoea occur periodically and become more frequent and of longer duration as the disease progresses. The animal begins to lose flesh more rapidly and there is soon a marked reduction in the milk secretion of lactating cows. The appetite as a rule remains relatively good.

It is a painless disease until the last stages are reached, when the animal, reduced to a mere skeleton, may show evidence of discomfort and suffering.

The periodic attacks of diarrhoea generally observed until death occurs and the extraordinary loss of flesh during the later stages of the disease, are typical of this infection.

The periodically appearing, but persistent diarrhoea of John's disease, with its mash-like watery faeces, which soil the hindquarters as well as the floor and walls of the stalls, should at once create suspicion. It should not be confused with the haemorrhagic diarrhoea of young calves caused by a minute animal parasite producing coccidiosis, nor with the diarrhoea affecting young cattle from calfhood, caused by stomach worms (Parasitic Gastritis).

POST-MORTEM APPEARANCES

Many diseases do not produce significant changes in the body which can be recognized at post-mortem by individuals who have not studied the body in health and disease. John's disease, however, generally produces marked changes along the lining of the small intestines (bowels). This surface presents a corrugated appearance similar to the corrugated zinc surface of a washboard, except that the corrugated lines are not as uniform. The walls of the intestines are much thickened and the intestinal lymphatic glands are swollen.

It has also been observed that the fat in the carcass of an affected animal is of a marked yellow colour.

It is remarkable that this chronic fatal disease does not cause other visible changes in the body, although it is not a difficult one to recognize after symptoms develop, nor to confirm for all practical purposes after death takes place.

METHODS OF INFECTION

The germs producing this disease generally gain entrance into the body with feed and water which have been contaminated or polluted with the discharges from affected animals.

Animals may become infected by direct contact with an infected animal, and by contact with infected premises or anything that has been soiled by the discharges of infected animals through the act of licking. They may also become infected by grazing on pastures on which infected animals have grazed.

While it has not been definitely determined how long the germs of this disease can live outside of the animal body, it is not considered safe to place animals on pastures which have been contaminated until the pastures have been vacant for a period of at least two months.

Contaminated ponds and pools are particularly dangerous and should be permanently excluded as a source of water supply.

Manure piles are also particularly dangerous, and the practice of leaving manure where animals can come in contact with it cannot be too strongly condemned. It is a certain means of spreading this infection through a herd; is often responsible for the spread of other diseases and for the infestation of

the animals with parasites or worms. It is consequently important, and it pays under any circumstances to store manure at all times where animals cannot have access to it.

HOW THE DISEASE SPREADS

The infected animal is the original source of infection and it will infect those that come in contact with it.

The movement of infected animals by any means for any purpose anywhere leaves a train of infection.

The discharges, and particularly the faeces in this disease, and anything that may be contaminated with these discharges, including the hands, clothes and boots of attendants and others, may carry the infection.

Dogs, cats, and other smaller animals coming in contact with these discharges may spread the infection to many premises.

CONTROL OF THE DISEASE

As soon as Johne's disease is suspected the animals under suspicion should be promptly removed from contact with other cattle and so maintained, and prompt advantage should be taken of competent veterinary advice.

It is well to remember that the infected animal is the chief source of infection, and all materials contaminated with its discharges are dangerous. These constitute the channels through which infection is spread, and there must be no contact direct, or otherwise, with anything on the isolated premises and the outside, if success is to be achieved. Dogs must be chained or locked up, and visitors must not be allowed to go on to the isolated premises. The attendants should be required to wear suitable apparel and rubber boots, and to disinfect them with care each time before leaving the isolated premises, which must be regarded as an infected place.

The stalls from which the suspected animals have been removed should be promptly cleaned and care exercised in the removal of the litter to prevent further contamination of the premises. The litter should be well covered with quick-lime and buried or stored where animals cannot come in contact with it. The stalls should then be thoroughly scrubbed with hot water and lye. Not until the floors, walls and mangers are as clean as it is possible to make them should a reliable disinfectant, of known potency, be applied, if good results are to follow.

It should be realized that infection is always due to the presence on the premises of minute living organisms and that small particles of manure and material of any kind may cover or harbour millions of them. Disinfectants, however potent, cannot destroy germs unless they come in direct contact with them, and it is consequently essential to success to exercise the greatest care in the cleaning process.

Upon completing the cleansing and disinfection of the known contaminated sections of the premises, the same procedure of cleaning, washing, scrubbing and disinfecting should be promptly undertaken of the remaining parts of the stable, and similar precautions should be taken with the manure.

The cleansing and disinfection of stables and premises is a laborious undertaking, but the cattle owner who takes pains to have it done thoroughly is well repaid through the curtailment of further losses among his stock.

There is no known cure for this disease after symptoms develop, and there is no available method to immunize cattle against this infection. Treatment must, therefore, be restricted to preventive measures. It is consequently in the best interests of the owner to slaughter animals showing symptoms with the least possible delay.

Carcasses of animals in a poor or emaciated condition are not fit for food, are of no value, and should be promptly burned or deeply buried with quicklime. Those of better nourished animals should be examined by a qualified veterinarian, who would be able to decide if the carcasses could be salvaged for food purposes, or if they must be destroyed.

As in all probability there will remain in the herd infected cattle not showing symptoms, the veterinarian should also be employed to identify them with the means at his disposal. The infected animals should be promptly taken out of the herd and kept strictly isolated. If given a liberal supply of minerals mixed with good nourishing food, and good care, many of them may fatten satisfactorily for the block.

As infected cattle which do not show symptoms may eliminate the germs of this disease with the faeces, they must be regarded as dangerous animals, and the necessary precautions must be taken with the manure, litter, and anything that may be soiled with their discharges.

Too much care cannot be taken in the cleansing and disinfection of the premises directly the animals have been removed for slaughter. They should not be disposed of for any other purpose, even though the animals may have put on flesh and appear healthy.

While it has not been definitely proven that infected animals cannot recover, investigators and others who have had many years of experience with this disease, consider there is little hope for recovery. With our present knowledge of this disease it would be unwise to take unnecessary risks, and consequently all known infected animals should be disposed of by slaughter.

While this disease has not been brought under the provisions of the Animal Contagious Diseases Act, the Department is prepared to render assistance to owners to determine if their animals are infected when difficulty is experienced.

Much experimental and investigational work has been in progress for many years in an endeavour to obtain a means to detect infected animals in a manner similar to that used for detecting tuberculosis. A product known as Johnin has been produced, which is proving an aid in this regard in countries in which this disease is prevalent. Owing to the peculiarities of the germs of John's disease much difficulty has been experienced in growing them outside of the animal body, and consequently the supply of Johnin, which is a product of the growth of these germs, is limited.

PREVENTIVE MEASURES

It cannot be stated too emphatically, nor repeated too frequently, that John's disease is a malady affecting cattle with low resisting powers and that the chief preventive measures consist in the maintenance of cattle in the highest possible state of vigour.

Caution should also be exercised in the selection of animals for addition to herds, and it is good sound practice to isolate them for at least thirty days before putting them with the herd.

As there is reason to believe natural infection frequently takes place in the early days of life by contact with infected dams or surroundings, calves should be removed immediately after birth from the contaminated place and raised where they will not be subject to exposure to infection.

With a better knowledge of disease brought about by scientific research, diseases causing enormous losses in the past have been eliminated over vast territories and brought under better control elsewhere.

While the incidence of certain serious diseases has changed under modern conditions, other diseases are slowly but surely increasing and are spreading and invading new territory.

With the development and maintenance of the abnormally high producing cow, breeding efficiency has been impaired and her resistance to disease lowered. Economic losses due to impaired breeding efficiency, diseases of reproduction and of the new-born, have increased to a serious degree, and the cow has become much more susceptible to microbial infections.

The development of the dairy cow to its present state of perfection is an accomplishment of many years of patient intelligent endeavour. It has transformed the cow, which originally was only required to produce sufficient milk to support her young, to an animal yielding enough milk to supply a small community of people.

The present day high-producing cow is an artificial animal producing milk beyond all natural bounds, and the care and feed which sufficed for the cow in the more natural state has been found quite inadequate. Experience has shown that in order to maintain health the materials derived from the tissues of the body to produce offspring, milk and butterfat, must be regularly replaced in the feed, as otherwise they are supplied at the expense of the animal body. The feed must consequently be selected and regulated with a view to preventing the general state of nutrition suffering from the continuous drain to which the body is subjected.

Investigators have shown that substances of unknown composition, named vitamins, are essential to normal nutrition and growth, and that these vitamins have a definite relation to the assimilation of nutritious material.

It has further been demonstrated that animals fed upon improperly balanced rations with insufficient vitamin content develop deficiency diseases. This is probably of very great importance in regard to Johne's disease, as it has been recorded that this disease has been more easily eliminated from herds when the animals have been put on properly balanced rations containing a liberal supply of minerals.

SANITATION

Animals kept in badly ventilated dirty stables, lose their vigour, and when exposed to infection easily contract disease. Dark, dirty, crowded and ill-ventilated stables, are especially favourable to the propagation of disease, and when infection is introduced into such premises disease not infrequently spreads with startling rapidity.

Good ventilation must provide for two things, first, the removal of foul air from the inside, and, second, the bringing in of fresh air from outside the building. No system is good that fails to accomplish these objects without causing unnecessary draughts. When both inlets and outlets are proportioned to the size of the building there should be a constant circulation of air, and no sensation of closeness should be perceptible in the stable.

Stables should be cleaned out often and the manure should be stored in a locality where animals cannot gain access to it. Cleanliness includes keeping the walls and ceilings free from dirt, dust and cobwebs. These are all good resting places for disease germs.

Whitewashing the interior of the stable at least twice a year is a great aid to cleanliness, and also has a destructive action upon disease germs.

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