

Johne's Disease

Johne's disease is a chronic disease which progressively damages the intestines and after a period of scouring and weight loss, ultimately results in the animal's death. It causes huge economic loss to the national cattle, sheep and deer industries and yet its presence goes unrecognised in many herds or flocks. Johne's is a disease of ruminants so goats, alpacas and llamas can also be affected.



Johne's disease is caused by a bacterium, *Mycobacterium avium* subspecies paratuberculosis (or MAP for short).

Cattle can become infected with MAP at any age, although infection within the first few weeks or months of life is most common. Calves can become infected before they are born.



Following infection, bacterial multiplication is slow so that clinical signs of disease are usually only seen once the animal has reached between three and six years of age. It is possible for animals as young as 18 months to show signs of clinical disease. Johne's disease is widespread in the cattle, sheep and deer populations in New Zealand.

Clinical signs of Johne's disease

Prior to clinical disease there is a reduction in productivity in the pre-clinical phase. The financial losses that result are of great significance. Classic signs of Johne's disease are:

- Scouring and weight loss despite, in most cases, the affected animal remaining bright and still eating and drinking.
- Periods of remission may be seen in which affected animals appear to improve in condition however the disease is essentially irreversible.



Eventually oedema ('bottle-jaw') will be seen.

- Animals become emaciated, and death will follow.
- Fertility of bulls and cows is reduced. The breeding lifespan of MAP infected animals is estimated to be approximately half that of uninfected animals.
- Milk production is reduced.
- Calves born to infected dams are likely to show poorer than expected growth rates.

Routes of infection

Most infections occur during the first 30 days of life due to ingesting the bacterium from contaminated milk, colostrum, teat surfaces or any other infected surface. Calves remain susceptible to becoming infected up until they are 12 months old, and thereafter become relatively resistant to infection due to natural immunity. The other main route of infection is through contaminated faeces. Cows showing signs of the disease will shed large amounts of bacteria, hence increasing the risk of other stock becoming infected. Faeces and milk are the main routes of excretion however the bacterium can also be excreted in urine or semen.

Diagnosis

Johne's disease is usually diagnosed based on animals showing clinical signs that are consistent with the disease, i.e. ill thrift and diarrhoea. From here blood testing is usually the next step in confirming the disease. Although testing can be good, only 88% of animals with the disease will test positive. This declines to 48% when testing animals that are showing no signs of disease. This is the reason why routine testing of animals showing no clinical signs of the disease is of questionable value.

Did you know? In 1895, German physician Heinrich Albert Johne and his American colleague Frothingham were the first people to describe Johne's disease. *Mycobacterium avium* subspecies paratuberculosis (MAP) is bacterium genetically related to the organism that causes tuberculosis however MAP does not cause tuberculosis in either animals or humans.



Herd health planning

In order to minimise the losses caused by Johne's disease it is important to define a herd's disease status and then to take appropriate action.

If Johne's disease is confirmed in a herd, controlling the disease to limit its impact will depend on biosecurity, hygiene and enlisting the farm vet's help to identify MAP-infected animals so they can be culled thereby minimising the spread of the infectious organism in the environment.



Identification and removal of MAP-infected animals:

1. Isolate all adult animals showing signs of diarrhoea and weight loss, and test for disease.
2. Cull animals confirmed to be suffering with Johne's disease, and those animals in which the disease cannot be ruled out.
3. Trace the offspring of infected animals and ensure they are not kept as replacement breeding stock as there is high risk that they are also infected.

Prevention and control

Hygiene is particularly important at calving and for the first few weeks or months of a calf's life when there is the greatest vulnerability to infection.

Reducing faecal-oral contamination

- Pick up new born calves at least twice a day, ideally more frequently, to prevent suckling of dirty teats and contact with contaminated environment.
- Keep feed and water free from faeces.
- Young stock should not graze where mature cattle have been.

Colostrum/milk management

- Bacteria may be excreted into milk and colostrum. Milk and colostrum may also become contaminated by faeces from infected animals.
- Milk/colostrum from positive animals should not be fed.
- In heavily infected herds consider feeding milk replacer or pasteurising milk/colostrum before feeding to calves. Pre-milking teat dipping would also be advisable in heavily infected herds.

Vaccination

- Prevents the development of clinical disease but does not prevent infection.
- Must be combined with changes in management to prevent disease.
- Can cause injection site reactions.
- Interferes with testing for bovine tuberculosis. Therefore consent must be given by MPI to vaccinate a herd especially in areas where tuberculosis is present.

Biosecurity facts

If Johne's disease is not present in your herd, biosecurity precautions to prevent its introduction are vital. This means screening all replacement animals. However, Johne's disease has a long incubation period, and so the sensitivity of the currently available laboratory test is relatively poor. This means a single negative test on a young replacement breeding animal, whether bull or heifer, is relatively meaningless. Of greater reassurance is evidence about the status of the herd of origin of the replacement animals.



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