

NADIS Health Bulletin



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Health Quiz

Johnes Disease (Paratuberculosis)

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Johnes's disease (Paratuberculosis) is a chronic enteritis of adult cattle and sheep caused by *Mycobacterium avium* subspecies *paratuberculosis* (MAP). The main signs in cattle are progressive weight loss and chronic diarrhoea (Fig 1). Diagnosis and control are difficult. If your herd has no history of Johnes's disease it is critical that all measures are taken to prevent introduction of infection because eradication of disease once prevalent in the herd proves very costly and may take many years.

There is limited but disputed evidence that the organism may be associated with Crohn's disease in humans.

Economic importance

It is estimated that there were 1,000 cases of Johnes's disease in the UK during 2000, increasing to 2,400 in 2004 affecting between 20 to 50 per cent of UK herds. In infected herds the annual culling/mortality rate may be 1 to 5%. However, losses due to subclinical disease (weight loss, reduced milk yield; poor fertility) are also substantial. The financial losses are estimated to be £2600 in a 100 cow dairy herd with clinical cases but this is likely to be a gross underestimate.

Causes and background to disease

The disease occurs worldwide, but especially in temperate climates, and affects particularly cattle, sheep, goats and deer reared in intensive systems. Many wildlife and exotic species are also susceptible to Johnes's disease.

There is evidence for intrauterine infection of the developing calf in the case of heavily-infected dams.

The disease is also transmitted to young calves by ingestion of the organism in colostrum, and from the faeces of infected animals contaminating food and surface water/water troughs (Fig 2), and the cow's teats (Fig 3). There is a long incubation period and clinical disease is not usually apparent until three to five years-old although younger cases are possible. Infected animals may shed organisms in the faeces for over a year before clinical signs appear.



Fig 1: The main signs of Johnes's disease in cattle are progressive weight loss and chronic diarrhoea



Fig 2: Faeces of infected animals contaminating surface water

Early clinical signs to watch out for

Diarrhoea, poor milk yield and weight loss occur in cattle three to five years-old with onset often following calving or other stressful event (sale, transportation etc). There is no fever and the animal maintains a good appetite until the terminal stages. Clinical signs may continue for several

months with the cow/bull becoming emaciated and is then culled for welfare reasons (Fig 1).

Control and Prevention

There is no single reliable test for confirming Johne's disease during the early stages of disease (test described as having a low sensitivity value).

Blood tests detect antibodies to crude *M.paratuberculosis* antigen but not all cases have a detectable antibody response. In practical terms diagnosis is best done using a combination of serology (blood tests) and faecal examination.

Control:

Control is difficult because of the long incubation period, shedding of infection by animals before they show clinical signs, and diagnostic techniques with poor detection rates in the early stages of disease.

Eradication requires a substantial commitment by the farmer, veterinarian and local laboratory and is based on identification and removal of infected animals. Blood testing and/or faecal examination may be done every 6-12 months with slaughter of positive cases. Two consecutive herd negatives may indicate eradication.

Practical control measures that can readily be adopted to limit losses in a diseased herd include:

Rapid culling of diseased animals.

Minimise faecal contamination of food, water and pasture e.g. by raising feed and water troughs, strip grazing, use of mains/piped water rather than surface/pond water, avoid spreading yard manure on pasture, maintain good hygiene in buildings/yards and calving boxes in particular (Fig 4).



Fig 3: Grossly infected environment around ring feeders in out-wintered autumn-calving beef cows



Fig 4: Clean calving environment



Fig 5: Separate newborn calves from dams at birth and rear by bucket with artificial colostrum/milk (only possible for dairy calves)



Fig 6: Ideal environment for spread of Johne's disease

Separate newborn calves from dams at birth and rear by bucket with artificial colostrum/milk (only possible for dairy calves Fig 5).

Do not feed waste milk to calves

Do not use calves from known infected dams as breeding replacements.

Restock only from accredited herds especially bulls.

Vaccination

Vaccination has been used as an aid in the control of Johnes in many countries and can be imported into the UK under license. Inoculation is given into the brisket area of calves less than one month old (preferably less than one week) producing considerable local reaction. Vaccinated herds/flocks have much reduced clinical cases and losses but Johnes's disease will not be eradicated. Vaccination may be the most cost-effective option for commercial beef herds breeding their own replacements and experiencing considerable losses from Johnes's disease. Vaccination against Johnes disease is not an option for many beef farmers because replacement heifers are typically bought as either yearlings or in-calf heifers while vaccination has to be undertaken within the first four weeks of life. Vaccination interferes with interpretation of the tuberculin skin test.



Fig 7: *Ideal environment for spread of Johnes disease*

Welfare implications

There is no effective treatment and animals must be culled as soon as the diagnosis is confirmed. It would be prudent not to keep the progeny of infected cows as breeding replacements. Such offspring will generally fatten normally as clinical disease is unusual before two year-old.

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NADIS Health Bulletins are designed to improve farm income, animal health and welfare by promoting disease control and prevention.

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