

# JOHNE'S DISEASE: WHY TEST?

The increased awareness of Johne's disease has prompted many farmers to look at options for managing the disease in their herds. Any management approach has to encompass the extent of disease in the herd of interest and the Johne's status of herds that are used to source replacements. In order to understand the complexities of the disease it is important to examine the disease, the clinical signs and potential sources of infection.

Johne's disease is an infectious bacterial disease primarily affecting the intestinal tract and is caused by the bacterium named *Mycobacterium avium* subspecies *paratuberculosis* (Map). It is a distant relative of *Mycobacterium bovis* the bacterium that causes tuberculosis (TB) in humans and animals, but Map does not cause TB. Young animals are considered to be the most susceptible to infection, although the long incubation period when the bacteria grow and multiply inside the immune cells of the animal means that clinical signs do not usually occur until cattle are older than 19 months of age. Map is excreted in the dung of infected animals and contaminates soil or water supplies. Outside the animal, Map does not multiply well, but can survive over a year in the environment because of its resistance to heat, cold and drying. Therefore, the primary source of infection is directly from infected animals. The body tries to rid itself of the bacteria which results in a thickening of the intestinal lining, preventing it from functioning normally and leading to poor absorption of nutrients and eventual diarrhoea. As a result, although animals may be feeling and eating well, they begin to lose weight gradually.

Many cases are not detected as they are subclinical or just culled as "poor doers". Whilst no concrete figures exist, it is estimated that UK herd prevalence may be anywhere from 20 to 40%. Losses attributed to the disease in the UK have been estimated at £16/cow in suckler herds and £26/cow in dairy herds

Due to the slow, progressive nature of the infection, the clinical signs of Johne's disease which include long-lasting diarrhoea and weight loss despite a good appetite are not generally seen until years after initial infection. In the infected cow or heifer, noticeable signs commonly start within a few weeks after a stressful event like calving.

Infection can be divided up into four typical stages:

- **Stage 1** – Initial infection. The animal becomes infected; not showing signs of the disease and cannot be detected by current tests as it is unlikely to have detectable antibodies or evidence of bacterial shedding.
- **Stage 2** – Antibody positive. The presence of antibodies suggests the animal is infected with Map and will progress to the later stages of disease, although the animal does not show any clinical signs. Antibody titres can fluctuate and there may be some bacterial shedding detectable in dung samples.
- **Stage 3** – Bacterial shedding. Antibody titres are likely to be high and Map may be detected in dung samples by PCR or culture, however bacterial shedding can be intermittent. Some weight loss or reduced milk production may be evident.
- **Stage 4** – Clinical disease (See Figure 1.1). Typically, there is chronic diarrhoea and weight loss, antibody titres are high and bacterial shedding can be detected.

A period of 2–6 years or more may pass for Johne's disease to progress through all four stages. There may be animals in all four stages in some herds. It has been suggested that for each animal showing obvious signs of Johne's disease (Stage 4), 5 to 15 other animals at various stages of infection are not showing signs.



Figure 1.1 Clinical signs of Johne's Disease

Johne's disease usually enters a herd in a healthy-looking but infected animal (Stage 1). As the disease progresses in that animal, Map is shed in large numbers in the faeces and can be found in colostrum. Ingestion of Map from teats, calving pens, pasture or pond water contaminated with infected manure is the most common way infection is spread. In favourable environmental conditions, Map can remain viable for over a year on pasture. Milk or colostrum from infected dams is also a potential source of infection. Map is more likely to be excreted in milk of infected females in the later stages of disease and it has been suggested that 36% of stage 3 and 4 cows have Map in their colostrum. The chance of transmission of infection through colostrum and milk is high in beef herds where the calves remain with their mothers. Map may be excreted directly through the mother's milk or infection may be passed on through contaminated faeces around the teats. There is also the possibility of a fetus becoming infected before birth if its mother is in the later stages of the disease.

The ideal approach in managing Johne's disease is to determine herd status through a Cattle Health Certification Standards (CHCS) registered cattle health scheme such as Biobest Herdcare, which provides maximum confidence in herd status, and enables disease-free herds to be duly certified and recognised as Accredited free. In order to attain accredited status, two clear herd tests on all cattle over 2 years are required a minimum of 12 months and a maximum of 24 months apart. Subsequently, a clear whole herd test on all cattle over 2 years has to be carried out annually to maintain accreditation.

Regular testing over time provides the most reliable method of determining whether disease is present in the herd and offers a way to control and eliminate the disease from herds where infected animals are identified. A herd accreditation scheme enables farmers to buy and sell animals of known status.

However, there are occasions where farmers may struggle to justify the cost of the whole herd individual animal testing that meeting and maintaining accredited status entails. This is particularly the case for commercial herds, and has led to many farmers adopting for the 'ostrich principle' by sticking their head in the sand and ignoring any potential problem. Ignoring Johne's disease can be extremely hazardous as it increases the risk of introducing infection into disease-free herds, and also increases the prevalence of disease in herds that are already infected.

**If you would like to know more about Johne's Disease testing or Herdcare, please do not hesitate to contact the Cattle Health Scheme Manager or the Veterinary team at Biobest on 0131 440 2628.**