

# Johne's Disease (Paratuberculosis)

Johne's disease is a chronic, progressive, wasting disease of ruminants caused by *Mycobacterium avium* sub. *paratuberculosis*. The disease is characterised by a long incubation period, with clinical disease usually only occurring in older animals.

**Classification:** OIE List B disease

## **Susceptible species:**

Cattle are the main species affected, with goats, sheep, deer and alpacas also susceptible. Susceptibility to infection is greatest in young animals, especially those less than 3 months old. Clinical disease is usually seen in older animals.

## **Distribution:**

The disease occurs in many countries, especially those with cool climates, and is most prevalent in intensive dairying areas.

## **Transmission:**

- ✓ Infection of young animals occurs through the **ingestion** of infected fecal material on contaminated teats of dams, or contaminated pasture or water.
- ✓ The causative bacterium is excreted in large numbers by diseased animals and to a lesser extent by asymptomatic carriers.
- ✓ The bacteria are stable in the environment and may survive 12 months or more in sheltered situations.
- ✓ *M. paratuberculosis* has been isolated from male and female reproductive tracts, from semen and from unborn calves of infected cows.
- ✓ It is excreted in the milk of infected cows, especially if clinically affected.

## **Clinical signs:**

Clinical signs are rarely seen in cattle younger than 2 years and are usually observed between 2 and 6 years of age. Clinical disease may occur at a younger age in sheep and alpacas. Appetite is usually unaffected. The main features are:

### **Cattle and deer**

Diarrhea  
Wasting  
Dehydration

### **Sheep and goats**

Emaciation  
Weakness  
Depression  
Diarrhea, is not usually as severe as in cattle

- Sub-clinical infections are common in all species and sub-clinically infected animals are a source of transmission of the disease.

### **Post-mortem findings:**

Thickening and corrugation (waving) of the intestinal mucosa, particularly in the terminal ileum and ileo-cecal area and associated lymph nodes are swollen and edematous

### **Differential diagnosis:**

Other conditions with signs that could be confused with Johne's disease include:

1. Salmonellosis
2. Coccidiosis
3. Parasitism
4. Chronic molybdenum poisoning
5. Wasting due to cobalt deficiency

### **Diagnosis:**

- The detection of sub-clinical diseases can be done by delayed-type hypersensitivity (**DTH**), consisting in intradermal inoculation of avian tuberculin and the observation 72 hours later of swelling at the inoculation point. (poor sensitive test)
- Common serological tests include **complement fixation** and **ELISA** but those are of unknown sensitivity.
- Faecal samples can be submitted for identification of the Mycoplasma by bacteriology.
- Faecal samples can also be submitted for DNA probes detection associated with PCR, commercial kits have been recently developed.
- At post-mortem, samples of small intestine especially terminal ileum and ileo-caecal valve region for histopathology, samples are stained with Ziehl-Neelsen's method.

### **Control / vaccines:**

1. Control of spread of infection has been constrained by the lack of an efficient serological test for the detection of sub-clinically infected animals.
2. Control programs involve preventing exposure of young animals to contaminated feces or milk and the prompt removal of known infected animals and any close relatives (dam/offspring) from the herd or flock.
3. Vaccination against Johne's disease reduces, but does not eliminate, bacterial excretion.
4. Vaccination may interfere with bovine tuberculosis programs because vaccinated animals are sensitised to tuberculin, and the vaccine antibodies interfere with serological testing for Johne's disease to detect infected animals.