

LEPTOSPIROSIS AWARENESS

Understanding the risks & diagnosing infections

Disease overview:

Leptospirosis is an economically important zoonotic bacterial infection of livestock that causes abortion, stillbirth, infertility, and loss of milk production, and is caused by infection with the spirochete *Leptospira*.



Different leptospiral serovars exist, based on surface antigens on the organism. Specific serovars tend to be associated with one maintenance host. Cattle are the maintenance host for the serovar Hardjo although there is some evidence that this serovar can also be maintained in sheep.

In the Irish cattle herd two distinct species exist within the serovar Hardjo: *Leptospira interrogans* serovar Hardjo (type hardjopravitno) and *Leptospira borgpetersenii* serovar Hardjo (type hardjo-bovis). The former is more closely associated with disease of the reproductive tract and the latter with renal infection and the risk of zoonotic transmission. Transmission of the infection among maintenance hosts is mainly through contact with infected urine, placental fluids, or milk, resulting in a high proportion of the contact population becoming infected.

However, the infection can also be transmitted venereally or transplacentally.

Moisture and warm temperatures favour the survival of leptospires and under these conditions the organism may persist for days to weeks outside the animal; survival is brief in dry soil or at freezing or sweltering temperatures. Therefore, in Ireland leptospirosis occurs most commonly in the spring, autumn, and early winter.

Introduction of infection to the herd

Biosecurity risk factors:

- An open herd policy resulting in the purchase of carrier animals.
- Co-grazing with sheep.
- Sharing bulls.
- Allowing cattle to drink from water sources that have flowed through other farms.



Risk of maintaining herd infection

- Once infected, and despite the onset of immunity, animals can continue to shed the organism for periods in excess of a year.
- Add this to a regular supply of naïve heifers as occurs in most dairy herds and the perfect conditions are created for endemic herd infection.



Clinical signs

- Fever and agalactia.
- Abortion or stillbirth.
- Weak or under-sized calves.
- Drop in conception rate.
- The impact on the herd varies depending on the level of immunity, stage of breeding and the strain of Leptospire present.
- Leptospirosis can have a major impact on the reproductive performance of the herd.



Diagnosis

Serology:

- Animals seroconvert to infection with both species of L Hardjo by 14 days and animals may remain seropositive for periods of several years following infection.
- Paired serology can be used to diagnose the acute phase of disease if the first blood sample is collected when the animal has fever and milk drop and the second sample is collected at least two weeks later.
- Where reproductive failure has occurred the animals will have seroconverted by the time the abortion is detected and paired serology is of limited value. A single sample can be used to demonstrate exposure only but this may not be associated with the reproductive failure.
- In herd investigations sampling from different management groups and age groups will provide a clear guide on whether exposure has occurred and may offer some indication as to the pattern of infection in the herd.

Foetal examination:

- There are no specific pathology findings to help with diagnosis and the ability of diagnostic laboratories to detect leptospire in foetal material appears to be limited.

- PCR tests for the presence of the genetic material of the organism have been used, but the detection rate has been very low. In some cases of abortion and stillbirth the developing calf has had time to develop a serological response to infection and the detection of specific antibody in foetal serum is considered diagnostic.
- In relation to the investigation of leptospirosis as a cause of foetal death the greatest value of foetal examination lies in excluding other causes of abortion.

Zoonotic risk

- The principal route of infection for humans is exposure of mucous membranes or skin to infectious body fluids, especially urine and birth products.
- For those working with cattle, particularly in the parlour, there is a very real risk of exposure to infection.
- Appropriate precautions should be put in place to reduce the risk of transmission in the infected herd, such as wearing gowns and gloves to avoid contaminating exposed skin and wearing face shields to avoid inhalation of aerosols.
- In people, the disease varies from subclinical to severe and can be fatal when renal or hepatic failure occurs.
- The most common signs are fever, headaches, rash, ocular pain, muscle pain, and malaise. Unexplained instances of such signs in people working with animals should be reported to a doctor.

