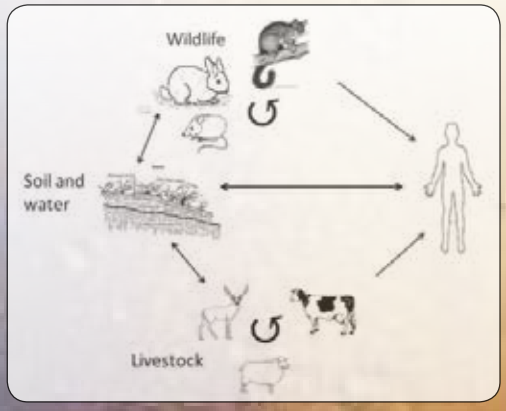
Leptospirosis in Dairy Cattle

Leptospirosis is a bacterial infection and is an important zoonotic disease in New Zealand especially for people working with livestock such as farmers, abattoir workers and veterinarians.

The bacteria colonises the kidney and genital tract of a maintenance host (cattle, pigs, rats, possums and hedgehogs are all implicated here) and is shed in the urine which is a major source of contamination and infection to accidental hosts (sheep, deer and other animals as well as humans) in which clinical disease can occur.



Leptospires can survive in wet soil and stagnant water and the likelihood of infection increases with heavy rainfall and flooding. Leptospires do not replicate outside of the host but their numbers in the environment can be maintained by constant shedding by infected animals.

Pigs are a major risk factor when they present on cattle farms. Ideally pigs should be vaccinated and their effluent kept far away from contact with cattle. Sufficient vaccination programmes are even more crucial on these farms.

Transmission is through mucous membranes of the nose, eyes, mouth, reproductive tract, digestive tract or breaks in the skin. Leptospires can also be shed through aborted foetuses, placental fluids and milk.

There are several serovars but the most common in New Zealand are *L. hardjo-bovis* and Ballum, and *L. pomona*. Cattle are maintenance hosts for *L. hardjo-bovis* and *L. pomona*, sheep for *L. hardjo-bovis* and *L. pomona*, pigs for *L. pomona* and *L. tarassovi*, and dogs for *L. copenhageni*. Infection will cause mild clinical signs and sporadic abortion in the maintenance hosts. Cattle that become infected with *L. pomona* can present with severe clinical disease.

Zoonosis

There are approximately 100 reported cases per year of leptospirosis in humans and many more non reported cases. High risk occupations are farmers and farm workers, meat processors and veterinarians. Infection occurs through direct contact with urine or contaminated soil or water and through inhalation of aerosolised droplets.

Symptoms of leptospirosis can be confused with influenza. Fevers, chills, headache, nausea, cough, abdominal pain, muscle pain, and diarrhoea are symptoms. In severe cases jaundice, kidney failure, meningitis, haemorrhage and hemodynamic collapse may occur. Many cases require hospitalization and there can be long lasting symptoms. Clinical illness varies from mild to severe with several weeks off work. Studies have shown that about 20% of infected people develop clinical signs and about 6% suffer severe clinical disease.

Signs of disease in cattle

L. hardjo-bovis

Infected cattle may not show obvious clinical signs, sometimes they have a fever, or just appear unwell or have loss of appetite. Lactating cows may develop mastitis or a drop in production. Abortion or stillbirths can result even 6 to 12 weeks after infection. It was estimated that about 10% abortions in beef cattle may be caused by *L. hardjo-bovis* or *L. pomona*. Chronic infection of the genital tract may result in infertility, abortion, stillbirths, and birth of weak calves. Most commonly cattle show no clinical signs with *L. hardjo-bovis* infection but can create a carrier state in the kidneys associated with long term urinary shedding.

L. pomona

Like *L. hardjo-bovis*, *L. pomona* can cause a fever and inappetence which may go unnoticed and can also cause abortion, still births and birth of weak calves. Abortion can occur after the 4th month of gestation during the acute stage or 6-12 weeks after infection. Most commonly, abortion occurs in the sixth or 7th month of gestation. Mastitis and a drop in production also occur. Mastitis due to leptospirosis does not respond to treatment and does not create an inflammatory reaction in the udder but does cause milk to resemble colostrum. Calves can suffer greatly from *L. pomona* infection; they will have a high fever, depression, haemolytic anaemia, jaundice, pale mucous membranes, and red water and may die within 3-5 days.

XLVets **Leptospirosis in cattle**

Infectious Diseases ID

Diagnosis

In cases of abortion there is rarely diagnostic lesions observed and it is very difficult to isolate leptospires for a definitive diagnosis in cases of abortion but it can be attempted. Blood testing the cow and foetus for serovar-specific antibodies is the best diagnostic tool to use. A real time PCR is also commercially available for testing urine shedding in live animals or kidney tissue of an aborted foetus. Antibody titres of 1:100 and higher indicate that animals are likely to shed Leptospira in the urine.

Post mortem examinations provide more clues in cases of acute infection with Leptospira. Infection can cause kidney and liver disease as well as red blood cells being destroyed which results in anaemia.

Treatment

Animals can be treated with appropriate antibiotics prescribed by your veterinarian. The aim of treatment is to prevent irreparable damage to the kidneys and liver but often by the time the animal is presented it is too late for antibiotics to be effective. Treatment will eliminate shedding of leptospires.

Herd health planning: Prevention and control

Farms are at risk if they have high rainfall during spring and autumn, experience flooding, those that have waterways through the property and have stagnant water pools in paddocks. Rodents, feral pigs, deer, sheep, possums, hedgehogs and rabbits may also be a source of infection. Livestock that are in contact with unvaccinated stock while grazing off farm are also susceptible.

Vaccination is the corner stone of leptospirosis risk management plans. Other preventative measures include fencing off of water ways, rodent control plans and general high standards of hygiene when working with cattle and pigs.

Vaccination

There are a number of factors that need to be considered in a vaccination programme:

- The likelihood of early exposure to infection
- Vaccine efficacy
- Interference with maternally derived antibodies

Animals vaccinated after being exposed to infection can continue to shed as adults. Therefore the older a calf is at the time of first vaccination the greater the likelihood of having already been exposed to the bacteria. Vaccines are efficient at preventing urine shedding (80-100% efficacy), as the animals are vaccinated before exposure to the bacteria. Recent research has shown that maternal derived antibody which the calf receives from colostrum is unlikely to interfere with vaccine efficacy. Most calves will have lost maternal protection by four to six weeks of age.

With dairy calves the recommended vaccination programme is to administer the first vaccinations ten weeks after the start of calving followed by a booster 4-6 weeks later. It is strongly recommended to have the vaccinations completed before the oldest calf is six months old. By thumb rule, all replacement stock should have completed their initial vaccination course before Christmas. A third vaccination should be given at the time of whole herd booster vaccination in the autumn.

SUMMARY:

- First vaccination when average mob age is seven weeks old or 10 weeks after start of calving
- Vaccinations completed by 18 weeks after the start of calving
- Booster vaccinations for all cattle during autumn.

Information and illustration material for this fact sheet was kindly provided by Massey University and the Farmer Leptospirosis Action Group, a project of the Sustainable Farming Fund (SFF/MPI). Information available at: www.leptospirosis.org.nz

For more information contact your local XLVets practice:

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