
Leptospirosis in Beef Cattle

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Leptospirosis is known to be a common disease of cattle generally resulting in reproductive failure such as abortion and infertility. This disease is most often caused by *Leptospira borgpetersenii* serovar hardjo (type:harjo-bovis). Leptospirosis is contagious and is spread by cattle including bulls. Diagnosis of the disease is difficult and may require urine testing which only certain animal disease diagnostic labs do. Control of the disease is based on the use of a vaccine specific for this disease and the use of antibiotic to eliminate disease carriers.

How Leptospirosis is spread

Leptospirosis is spread when urine, semen, milk or afterbirth of infected animals comes in contact with the eyes, mouth, nose, or reproductive tract of susceptible animals. The disease can also be spread from the mother to the calf before birth. In addition, *Leptospira* organisms can enter the body through small cuts in the skin. This organism does not cause a very good immune response in cattle and they cannot fight off this infection very well. Factors, which make the spread of the disease more likely, include:

- Purchased, infected cattle
- Shared bulls
- Water from infected herds upstream,
- The presence of carrier cattle in the herd
- Poor or infrequent vaccination programs
- Warm, moist environments
- Wildlife, such as deer, have not been shown to be an important part of the spread of Leptospirosis

Once the animal comes in contact the *Leptospira* organism, it enters the body and after a period of time takes up residence in the kidney and reproductive tract where it is protected from the immunity produced by most leptospira vaccines. The result of the infection is embryo loss in

early pregnancy or abortion in later pregnancy. It has been estimated that more than 50% of the herds in the Southeast are infected with Leptospirosis. However, the infection rate is believed to be much lower in beef herds than dairy herds. Recent research would indicate that the infection rate in US beef herds is about 10% though it is likely higher than average in the Southeast. Bulls may have a particularly high rate of infection due to their natural sexual behavior and are a common source of infection for the cows they breed.

Symptoms and Diagnosis of Leptospirosis

Infection with *Leptospira* causes death of the developing embryo and results in cattle that are pregnant for a short period of time and then come back into heat, often at a regular 21-day interval. Cows may require several breedings before they become pregnant or may not become pregnant at all during a breeding season. Cows may also abort in later pregnancy. Abortion rates from 5 to 40% have been associated with this disease though lower rates are more likely than higher ones in the beef herd. Weak calves, stillbirths and delayed return to heat after calving have also been a part of the disease pattern. An infected herd may have more severe problems one year than the next.

Blood samples can be sent to the state diagnostic lab for Leptospirosis diagnosis. The results of these tests can be helpful but require information on vaccination and reproductive history and careful Veterinary interpretation. The infected animal does not develop a high level of antibodies and often the blood test results in infected animals are negative. Also, vaccination of infected animals does not clear the infection but may result in enough immunity to cause a false positive test for a period of 1 to 4 months after vaccination. Therefore, blood tests are not useful for diagnosis in many cases.

Urine samples can be taken and tested for this disease. This urine testing is considered the most accurate way to diagnose *Leptospira* infection in cattle. However, many diagnostic labs do not perform this test and the testing is expensive. Urine must be taken after administering a diuretic to make the animal urinate. After 15 minutes and when the urine becomes clear, the sample is collected and shipped by overnight mail to a lab. A single positive sample likely means that the disease exists in the herd. A single negative test means nothing because up to 30% of positive cattle may have negative tests results. A minimum of 15 samples per herd should be taken to determine if this problem exists and how severe it is.

Aborted calves may also be sent to the diagnostic lab. However, the calf generally dies a couple of days before it is aborted and the resulting degeneration makes diagnosis difficult.

It is sometimes more cost effective to purchase and use a vaccine specific for the *Leptospira* that occurs in the US and use it in problem herds to see if the problem goes away. However, the vaccine is somewhat expensive and positive results from its use may take 3 months or more.

Control of Leptospirosis

The vaccines currently available in most “5 way” leptospira vaccines were produced using a type of the organism that occurs in Great Britain rather than the one that causes the disease in the US. The immunity produced by the use of this vaccine may not be specific enough to protect the cowherd. Also, these vaccines produce immunity in the blood stream but not in the kidney or uterus where the leptospira organism stays most of the time. A newer vaccines have recently become available in the US. These newer vaccine are made using the organism that causes this disease in the US and it does cause local immunity where it is needed. It has recently become available in combination with the other Leptospira types found in “5 way Lepto” vaccines. Neither type of vaccine will clear existing infections. Heifers often become infected long before breeding and vaccinations in herds having problems should begin as early as 1 to 4 months of age before the infection is established. A booster must be given 4 to 6 weeks later the first year the vaccine is given. Annual revaccination with a single injection is necessary to prevent new infections.

Vaccination of any type will not eliminate existing infections. To eliminate these infections, a long acting oxytetracycline antibiotic should be given at the time the first vaccination in herds know to be affected. This injection is given once under the skin. Be sure that the bull is included in the prevention program.

Recommendations for the use of Leptospira vaccines include:

If you are not using 5-way leptospira vaccine in your herd, you should start.

If you are using leptospira vaccine in your herd and are not having problems, you should continue its use.

The new leptospira vaccine is indicated in Tennessee beef herds when:

Urine or blood tests show the herd to be infected

Infection is strongly suspected based on symptoms of infertility and/or abortion

Individual pregnancies are very valuable, such as a purebred herd

All new additions to an infected herd should be isolated for 1 month, vaccinated and given oxytetracycline antibiotic before entering the herd.

Leptospirosis in beef cattle is a significant reproductive problem that is difficult to diagnose. However, with newer vaccines and the use of certain antibiotics it can be eliminated from the herd.