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Leptospirosis of Cattle

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Leptospirosis was first diagnosed in cattle in the United States in 1943 and in swine in 1950. Since that time, scientists have found several different serotypes of importance to animals and man in this country. The serotypes belong to the pathogenic group *Leptospira interrogans*. Of most concern in animals are the serotypes *pomona*, *canicola*, *icterohaemorrhagiae*, *grippotyphosa* and *hardjo*.

Originally, *L. pomona* was identified as the principal cause of the disease in cattle. However, an Illinois survey found that *L. pomona* in cattle had declined from 20.0% in 1955 to 5.3% in 1965, while *L. hardjo* showed an incidence of 17.6% and *L. grippotyphosa* 7.0% in cattle sampled in 1965. Wisconsin considers that *L. hardjo*, *icterohaemorrhagiae*, *pomona* and *grippotyphosa*, in that order, are most important in cattle.

A 1975 survey of leptospirosis in cattle tested in 36 states found 10.7% were positive for *L. hardjo* and 5.4% were positive for *L. pomona*. *L. pomona* was the most prevalent in the West, although *L. hardjo* was common.

In 1972, a new serotype, *L. szwajizak*, was isolated in Oregon. It was discovered in a herd of dairy cows that had a long history of difficult breeding, abortions and high calf mortality. Veterinarians first thought the herd was infected with *L. hardjo* and *L. pomona*. When vaccination was not effective, laboratory culture and testing determined that *L. szwajizak* was the cause. A special vaccine corrected the problem. This was the first report of *L. szwajizak* in the United States.

Recently, serologic tests have suggested the presence of *L. szwajizak* in a southwest Idaho beef herd that has a history of open cows and early abortions. Research is being conducted to determine if this organism is the cause of the problem in this herd.

The conclusions to be drawn from this information are that *L. pomona*, the most common in cattle at one time, is on the decline, possibly because of widespread vaccination programs against this sero-

type. *L. hardjo* seems to be becoming more common throughout the country and *L. grippotyphosa* is also on the increase. Other serotypes such as *L. szwajizak* may become of greater importance.

Transmission

Leptospirosis generally is spread through the urine. Cattle and swine are major sources of contamination because of their large volume of urine. When water contaminated with infected urine comes in contact with mucus membranes, eyes or even skin, the organism has the ability to infect another animal or human. The disease also can be transmitted during breeding from residual urine in the reproductive tract. Calves can become infected through milk from infected cows. Swine, and particularly carnivores such as dogs or cats, can become infected by eating raw carcasses or infected rodents.

Leptospirosis is an important disease in man. People who handle animals can contract the disease through direct contact with contaminated urine. Livestock handlers and veterinarians should wear protective clothing and gloves when working with potentially infected animals. Epidemics have also occurred in areas where people swim in contaminated waters. Under optimum conditions, the organism can remain viable in water for weeks.

Since leptospirosis affects a great variety of animals, both domestic and wild, there is continual transmission in areas where leptospirosis is present.

Signs in Cattle

Signs of leptospirosis in cattle range from mild, inapparent infections to acute infections which terminate in death.

The acute disease usually occurs in calves. The calves will have fevers from 104° to 107° F, and may have diarrhea followed by constipation, then again by diarrhea. Blood-tinged or coffee-colored urine and a yellowing of the mucus membranes and tissues are common. Death may occur in a short time. Consider

leptospirosis as a possible cause in cases of sudden death.

Older animals may also show acute symptoms although not as commonly as calves. In addition, lactating cows can have blood-tinged, clotted milk from a flaccid udder. Milk production nearly ceases.

The most common sign of leptospirosis in cows is abortion during the last three months of pregnancy. This frequently is the only clinical manifestation of the disease. Cattle may become infected carriers and develop serological evidence of the disease without apparent clinical symptoms.

Different serotypes of leptospirosis may act in different ways in cattle. The most prevalent sign of *L. pomona* and *L. grippotyphosa* is abortion during the last one-third of pregnancy. *L. hardjo* and *L. szwajzak* generally cause early fetal death, which results in open cows or delayed conception. In beef herds this becomes evident at the time of pregnancy checking or the time of calving.

Diagnosis

You cannot diagnose leptospirosis by the clinical signs. Many other diseases — brucellosis, vibriosis, trichomoniasis and others — may be confused with leptospirosis in breeding cows. Other bacterial and viral diseases can be confused with leptospirosis in calves. The only certain way to diagnose leptospirosis is through laboratory testing of the serum or cultural isolation of the organism. Generally, serum testing is used to diagnose leptospirosis on a herd basis. If significant titers are found against a certain serotype, you can be certain the disease is active in your herd.

Treatment

You can treat cattle from infected herds by giving them about 10 mg of dihydrostreptomycin per pound of body weight (25 mg/kg). Dihydrostreptomycin is effective in eliminating the shedding of the organisms in the urine as well as for treatment. Other antibiotics have been used in cattle but dihydrostreptomycin is recommended because it is most effective in eliminating the carrier state. Animals that have been exposed to leptospirosis or that are brought into infected herds should be vaccinated and also given dihydrostreptomycin.

Control and Vaccination

Many factors must be considered in controlling leptospirosis. All serotypes except *L. hardjo* have been recovered from wild animals in this country. Wild animals excrete the organism in urine and serve as a constant source of infection by contaminating waters and streams. Wild animals can also carry sero-

types such as *L. canicola* or *L. icterohaemorrhagiae*, not commonly found in cattle in Idaho. Cattle can remain carriers following infection and spread the organism in their urine for as long as 3-6 months. As one method to control leptospirosis, supply cattle with water which is not contaminated with urine, especially during confined feeding periods. Remember that streams can be contaminated. The disease typically moves down a stream from one herd to another.

You should vaccinate cattle annually against *L. pomona* because of its widespread distribution. Vaccinate dairy animals early in gestation to protect them during the last periods of pregnancy. Vaccinate beef animals in the fall because this is the period of greatest concentration of animals, and the time when best protection is needed. In areas where *L. hardjo* or *L. grippotyphosa* are present, use the trivalent vaccine each year. If you have weaner calves destined for feedlots, vaccinate them and then keep them isolated for 2 weeks before mixing them with other cattle.

Remember that vaccine against one serotype will not offer protection against another. Presently, only bacterins against *L. pomona*, *hardjo* and *grippotyphosa* for cattle are available commercially. Vaccines from particular outbreaks of different serotypes have been made from time to time with success.

In case of an outbreak of leptospirosis, vaccinate all exposed and susceptible animals as soon as possible. Dihydrostreptomycin has been used with success in treating animals in herd outbreaks.

Animals which have experienced the disease need not be sold because they will have a long immunity following recovery.

Conclusion

L. pomona has been the chief cause of leptospirosis in Idaho cattle, but the incidence of *L. hardjo* is increasing. *L. grippotyphosa* does not seem to be a great problem. If you suspect leptospirosis in your herd you should contact your veterinarian and have samples sent to a diagnostic laboratory to find if your herd has the disease and find what serotype. If there are other types such as *L. hardjo* in your area you should vaccinate against them. As many as 30% of the cows abort in some herds, so early diagnosis is important.

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