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Vibriosis in Sheep

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Vibriosis (*vibrionic abortion, vibrio*) outbreaks are responsible for serious economic loss in Idaho sheep flocks each year. A survey conducted between 1971 and 1976 showed that the disease caused at least 42% of all abortions in farm flocks and 15% in range flocks. The higher incidence in farm flocks might be a reflection of more crowded conditions and greater opportunity for ewe-to-ewe transmission of the disease. Vibriosis occurs nearly everywhere sheep are raised. The severity of outbreaks is probably related to weather and management practices in various localities.

The Disease

Vibriosis in sheep is caused by either of two subspecies of a bacterium called *Campylobacter fetus*. This organism is different from the one that causes vibriosis in cattle, and the disease manifestations also differ. The main manifestation of vibriosis in sheep is abortion occurring during the last half of the gestation period. Transmission in sheep is by mouth; rams are not a factor in transmission. In contrast, vibriosis in cattle is transmitted venereally and causes infertility.

The rate of abortions in infected flocks may be as high as 70%. Lamb loss of 10 to 20% is common. Ordinarily the death loss among aborting ewes is low but may approximate 5% in some flocks.

Carriers

Vibriosis organisms have been isolated from ewes every season of the year. Some ewes develop chronic infections in their intestinal tract and shed the germ in their droppings. Outbreaks are often sporadic and their occurrence cannot always be explained by contact with infected sheep, water drainage or human traffic. Carnivorous birds such as magpies are also capable of spreading the infection.

Transmission between members of a flock occurs following the first abortion. Aborting ewes discharge large numbers of the organisms in the aborted tissues. The bacteria enter other ewes by way of the mouth through contaminated feed and water and through the practice of curious ewes nosing and licking aborted fetuses and placentas. To prevent this, ewes that abort should be immediately isolated from the flock and aborted tissues and fetuses should be removed from the pens.

Susceptibility

Ewes may contact vibriosis at any age. The most severe losses are among young ewes, but older ewes can be highly susceptible. In an affected flock where older ewes have a low incidence of abortion compared to younger ewes, the older ewes have probably developed an immunity from a previous undetected infection. Non-vaccinated replacement ewes purchased from a flock that has no history of abortion are likely to be very susceptible to the disease.

The incubation period in experimentally inoculated ewes ranged from 8 to 60 days. Ewes are most susceptible to vibriosis in the last 3 months of gestation. Open ewes inoculated with live organisms become immune and did not abort during the next pregnancy.

Immunity

Ewes that aborted after being experimentally infected with *Campylobacter fetus* were immune to vibriosis during the next gestation and for at least 2 years longer. However, there are two varieties of vibriosis bacteria and immunity to one variety does not protect against the other. Nevertheless, ewes that abort are probably immune to that particular bacterium for life and should be kept in the flock.

Evidence also indicates that ewes which lamb normally during a vibriosis outbreak develop immunity through exposure to the infected animals. However, there is no assurance that such exposure is adequate to provide reliable immunization.

Vaccine is Available

A vaccine is available that contains killed organisms of both of the immunologic types of bacteria that cause vibriosis. The manufacturer of this vaccine recommends that it be administered a short time before or shortly after the ewes are exposed to rams, with a second dose to be given 60 to 90 days later. Yearly re-vaccination is recommended.

Research is now being conducted by the University of Idaho in cooperation with the U.S. Department of Agriculture and Rangen Research Laboratory, Inc., Hagerman, Idaho, to develop a vaccine that will protect sheep from the common causes of abortion with one injection. The first version of this vaccine will be available in 1979 in limited quantity for use only within the state of Idaho. The research goal is to improve the scope of protection provided by the vaccine and to develop economical methods for production.

We strongly recommend that sheep owners in areas where vibriosis commonly occurs administer the available vaccine to all replacement ewes each year. Those who have not had a vibriosis outbreak in recent years should consider vaccinating all ewes.

Antibiotics

Daily feeding of 80 mg of chlortetracycline per ewe is effective in preventing vibriosis, according to research results. The feeding was started several days before the ewes were experimentally inoculated with vibriosis organisms and was continued until lambing. Current recommendations are to feed approximately 150 mg of a tetracycline antibiotic per ewe daily. The procedure is expensive. However, some sheepmen report other benefits in terms of reduced ewe and lamb mortality. If this is true, perhaps the feeding of antibiotics to ewes in late pregnancy is economically justified.

Epidemic Control

Vibriosis outbreaks seem to have no established pattern. Ewes in a flock with no history of vibriosis are almost as likely to contract the disease as are susceptible replacement ewes placed in a flock which recently had vibrionic abortions. The sporadic pattern of outbreaks leads many sheepmen to gamble that the disease won't strike their flock. Thus, even though methods of prevention are available, outbreaks of the disease occur each year.

Before the vaccine became available, attempts were made to use antibiotics alone in epidemics. Although the antibiotics were effective under experimental conditions, their effect in field trials involving actual outbreaks was disappointing.

After the vaccine became available, researchers tested a single injection of the vaccine along with injections of antibiotics on 2 successive days. The tests showed that vaccinations in early stages of the epidemic provided some immunity to ewes not yet infected and that antibiotics administered at that time can reduce the incidence of abortion among ewes already infected, but still in the incubation stage of the disease.

The antibiotics-plus-vaccine approach has been used in the field in a large number of outbreaks. When the cause of abortion was diagnosed early and treatment was started without delay, abortions ceased in 7 to 10 days. However, the course of the epidemic was not significantly altered in flocks where abortions were well established. So early diagnosis and prompt treatment can result in tremendous savings to the sheep owner.

Diagnosis

Contact your veterinarian immediately when you suspect an outbreak of vibriosis in your flock. Diagnosis is a simple procedure based on cultural isolation of the causitive organism. In sending specimens to the laboratory, the entire fetus and afterbirth should be frozen and shipped by the most rapid means available.

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