Neospora caninum in cattle

Biovet Technical Review
Important Information for Dairy Practitioners

Epidemiology

Neospora caninum is a protozoan parasite involved as a major cause of abortion in cattle. Between 10 and 25% of aborted fetuses submitted to diagnostic laboratories around the world are found to be infected with Neospora.

Until recently, the only confirmed route of infection was in utero transmission from dam to calf. Vertical transmission occurs in up to 90% of pregnancies in infected dams, and this mode of transmission is believed to be important in maintaining infection in a herd. Recent epidemiological studies have suggested the dog may be involved in the horizontal transmission of Neospora. In fact, it has now been confirmed that the dog is a definitive host for Neospora and that it may transmit the protozoa by contaminating the feed with oocysts excreted in their feces. It is not known if other animals than the dog can transmit Neospora. The cat, however, is unlikely to be a definitive host for Neospora.

The abortions usually occur between 4 and 7 months of gestation but may occur at any time. A peculiarity of Neospora infection is that an infected cow will likely be infected for life, and that she may abort more than once, even in the presence of specific antibodies. Seropositive cows have a risk of aborting 2 to 3 times greater than seronegative cows (the risk may even be 20 to 50 times greater during abortion storms). Abortions caused by Neospora may occur sporadically or in epidemics. It is thought that immunosupression induces recrudescence of the infection and may be involved in the pathogenesis of abortion.

Diagnosis

Diagnosis of an abortion cause by Neospora is confirmed through histopathological and immunhistochemical examination of an aborted fetus. Maternal serology may also be helpful in suggesting the presence or absence of Neospora.

An ELISA is available for serological testing for Neospora. The test specifically detects antibodies to Neospora in cattle and in dogs. The test is considered to be very specific; a positive result indicates the cow/dog is infected. Because Neospora encysts, it is possible that an infected animal will have a drop in antibody levels. It is therefore recommended that practitioners re-test suspect animals after a couple of months.

Herd screening may be used to estimate herd prevalence and to identify infected cows. The Biovet ELISA, which has high sensitivity (latest date approaches 100%) and specificity (up to 97%), provides rapid and accurate herd testing. Testing the entire herd allows identification of all seropositive cows. Alternatively, a screening of cows with a history of abortion may be done. Cows related to the seropositive cows identified in the screening would subsequently be tested.
Prevention

The key to prevention is to identify infected cows and prevent new infections from occurring. To avoid vertical transmission, it is recommended not to retain heifers born to seropositive cows. Alternatively, since a non-infected heifer may be born to a seropositive cow, heifers may be tested serologically either prior to colostral consumption, or after 6 months of age once passive antibodies have disappeared. Only seronegative heifers are then used as replacement stock. It is also recommended to progressively cull seropositive cows as they maintain infection in the herd through vertical transmission and provide infectious material (aborted fetuses) to the definitive host (dogs).

To prevent horizontal transmission from occurring, domestic and wild animals, particularly dogs, should not have access to cow feed. Also, they should not have access to potentially infectious material (placentas, aborted fetuses and dead calves).

Because abortion is thought to be associated with immunosuppression, it is also recommended to strengthen herd immunity by implementing or maintaining an appropriate vaccination program. However, there is no vaccine available for N.caninum. In herds where embryo transfer is used, it is essential to only use seronegative recipients.