



The Veterinary Link

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Persistent infection with BVD

Bovine viral diarrhea (BVD) infection is responsible for a variety of economically important syndromes in beef herds. The economic losses from BVD infection will vary between herds, based on herd immunity and stage of gestation at the time of exposure, the virulence of the BVD strain, and other factors.

Don't be fooled

The name of this virus is misleading because diarrhea is seldom a symptom of infection. The virus is known to cause immune suppression, respiratory disease, infertility and fetal infection. Fetal infection (infection of the fetus during pregnancy) can lead to early embryonic death, abortion, birth defects, stunting or the birth of persistently infected (PI) calves.

PI cattle are the result of exposure to one biotype of BVD prior to the development of a competent fetal immune system, which occurs at about 125 days of gestation. If a PI fetus

survives to term, it will always have a tremendous number of the viral organisms in its body, and it will not be able to mount an immune response to the virus.

A PI animal will be infected with the virus its entire life. Any calf, feeder animal or cow that is exposed to the BVD virus after birth may become infected and secrete the virus (be contagious) for a few days, but a PI animal will secrete many times more viral organisms every day of its life. A recent survey of randomly selected beef herds in five geographically diverse states (Alabama, Nebraska, Nevada, North Dakota and Ohio) found that 3.9% of the herds surveyed had at least one PI animal, and nearly three out of every 1,000 calves were PI.

Because suckling PI calves are in contact with the breeding herd during early gestation, they are considered to be the primary source of the BVD virus in breeding herds, causing pregnancy loss, preweaning mortality and the

introduction of PI calves into the next generation. The virus does not live long in the environment, but is easily transmitted from infected calves to pregnant cows or other cattle.

Herd effects

Decreased pregnancy percentages in herds with at least one PI animal in contact with breeding females could be due to ovarian dysfunction, failure of fertilization, early embryonic death or mid-gestation fetal loss.

In addition to a decreased pregnancy percentage, reproductive efficiency can be decreased due to fatal birth defects following fetal infection of BVD between 100 and 150 days of gestation. The lesions associated with fetal infection with BVD include abnormal brain development, damage to the spinal cord, cataracts, eye abnormalities, sparse coat, mouth/jaw malformation, growth retardation and abnormal lung development.

At least 20%-50% of PI calves die prior to weaning age, but a few look normal and have normal growth rates until weaning age or beyond. The PI calves that are alive during the breeding season are the greatest concern to ranchers trying to control this virus.

Identifying PI calves

PI calves can be identified by a number of laboratory tests. A relatively new test that is very accurate for an animal of any age is performed on a small skin sample taken from the ear with a pair of ear-notching pliers. This test is able to differentiate between a PI animal and an animal that will be able to clear the virus from its body.

PI animals should be destroyed, so it is important to be able to differentiate between PI animals and animals that have been exposed to BVD after birth and therefore are not nearly as great a threat to the herd.

If herd history suggests that PI animals may be present in a herd, a whole-herd screening to find and

remove PI animals should be done before the start of the breeding season.

One procedure for screening herds for PI cattle prior to the start of the breeding season involves initially testing all replacement heifers and bulls, all calves, and all dams without calves (due to calf death or failure to calve). In subsequent years, a strategy of vaccination and herd isolation should be implemented during the breeding season to decrease the risk of exposure to animals infected with BVD. For one or more subsequent years, testing all calves in a breeding pasture prior to the start of the breeding season may be required to eliminate PI animals from the herd.

Once the herd is free of PI calves and cows, only replacement breeding animals need to be tested for persistent infection with BVD. Therefore the cost of a BVD PI screening program is high in the initial one to three years and then is lower in following years.

If herd history does not indicate a current BVD problem, a strategy to implement a BVD biosecurity and screening program for incoming cattle, while maintaining a BVD vaccination program, appears to be a better economic alternative to herd screening for PI animals.

Vaccination programs can provide fairly good protection against BVD-induced disease when the exposure is from animals that became infected with BVD after birth. Vaccination programs offer some protection against BVD-induced disease when the exposure is from PI animals, but the protection is lessened because of the tremendous number of viral organisms excreted by PI animals. Vaccination programs are an important component in BVD control, but will only offer a high level of protection if herd contact with PI animals is eliminated.

Open heifers should be given modified-live virus (MLV) vaccines two or more times from weaning to six weeks before breeding. Multiple vaccinations allow the maximum number of heifers to develop active immunity. Annual boosters can be given to the adult herd to increase its immunologic protection to BVD.



Take extra care in mid-pregnancy

A cow that is exposed during mid-pregnancy (42-150 days) to the virus that causes bovine viral diarrhea (BVD) may transfer the virus to her fetus, which may either abort or be born persistently infected (PI) with the virus. PI calves remain infected with the BVD virus their entire lives and secrete a tremendous number of viral organisms in nasal discharge, feces and urine every day.

