



Bovine Virus Diarrhea

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Occurrence and Susceptibility

Bovine virus diarrhea (BVD) is an infectious disease of cattle. The virus is widespread throughout the United States. Serological surveys conducted at slaughter have indicated that 70-80 percent of the cattle population has been infected with BVD virus. Blood sample analyses also show that many herds of healthy appearing cattle have been infected, yet only rarely have the animals appeared sick.

The incidence of acute clinical disease usually is low, about 5 percent, with a case fatality rate of infected animals ranging from 90 to 100 percent. In a clinical outbreak in closed herds without immunity from vaccination or natural exposure to the virus, cattle may be severely affected, with death losses as high as 25 percent.

All ages of cattle are susceptible, but acute disease is most common in young cattle from 8 months to 2 years old. Calves nursing immune cows obtain colostrum antibodies that offer protection up to 6 to 8 months of age.

BVD in Dairy Cattle

In dairy herds, the most severe problem is in adult cattle in isolated herds that have had no exposure to

BVD. Generally, the highly susceptible adult animal is much more seriously affected by BVD than is the animal that is less than 6 to 10 months of age. This pattern of age susceptibility and disease severity is somewhat comparable to mumps in humans; mumps, too, are milder in children than among adults. In nonimmune animals, however, BVD can be a disease of all ages. Calves born of immune mothers (those vaccinated or those that have had BVD) normally are protected for approximately 4 to 8 months after birth. Protection comes from antibodies in the colostrum that calves receive from their mothers.

BVD in Beef Cattle

BVD is a serious disease among feedlot calves. Many calves have a low level of immunity or no immunity against BVD when they enter the feedlot. There are several reasons why this may be true: 1) BVD may not have been present in the adult herd or on the range, so no immunity exists in the cows or calves. 2) There was no vaccination program at the herd of origin and thus no colostrum immunity in the calves. 3) The calves originated from a range with a low cattle population per acre, thereby decreasing the chance for natural exposure to BVD virus. 4) If the



Acutely infected animal showing slobbering plus nasal and ocular discharge.

calves are more than 4 to 8 months of age they may have lost most of the protection from colostrum antibodies and are thus highly susceptible to stress and disease.

Calves from many sources frequently are put together at auction markets. It is reasonable to assume that some of these calves may have been exposed and are now affected with BVD. This results in the exposure of other highly susceptible calves in the lot. This exposure to BVD, as well as to other viral and bacterial disease organisms, plus the stress of weaning, handling, and shipping, frequently results in acute illness of feeder calves that arrive at the feedlot. Different combinations of viral infection (BVD, infectious bovine rhinotracheitis, parainfluenza 3, bovine respiratory syncytial viruses, rhinoviruses, reo viruses, and others) and *Pasteurella pneumonia* frequently result in serious calf losses.

Clinical Forms of BVD

Subclinical Infections

- Many calves exposed to BVD virus develop antibody titers to the disease without showing clinical signs of illness.

Acute Respiratory Infection

- This disease is highly acute.
- Calves are dull, listless, and clinically ill.
- Nasal discharge and lacrimation are in evidence.
- Elevated temperatures (104°-106° F.), rapid respiration, harsh dry cough, and increased heart rate are common early in the course of the disease.
- A sudden fall in the milk yield of cows is common.



Erosions in the mouth of a calf in the acute stage of severe BVD infection.



Erosions in the mucosa of the esophagus as seen opened at necropsy.

Acute Diarrhea

- This form of the disease usually occurs 2-4 days after the onset of clinical illness. Feces are foul smelling and may contain mucus. Straining at defecation is common.
- Loss of appetite and a gaunt abdomen are frequent clinical signs.
- Excessive saliva drips from the mouth.
- Erosions occur on the mucosa of the lips, mouth, esophagus, stomach, and intestines; lesions heal in 10-14 days in animals that recover.
- Dehydration and weakness are progressive, and death may occur 2-7 days after the onset of disease.

Chronic Diarrhea

- Animals that survive an initial bout of BVD but do not completely recover may experience

intermittent diarrhea, inappetence, progressive emaciation, rough dry hair, chronic bloat, hoof deformities, and chronic erosions of the mouth and esophagus. These animals may continue as "poor doing" animals in the feedlot, but usually they die before too long.

Abortion

- Pregnant cows may abort as a result of clinical infections.
- Abortion also may follow in the aftermath of subclinical infections in herds where no previous signs of illness have been noted.
- A pregnant cow infected by BVD virus in early gestation may begin cycling and appear to be a repeat breeder. This is due to early death of the embryo caused by the virus infection.
- BVD virus has been found in late term aborted fetuses, but its role in this syndrome is not fully understood at this time.

Cerebellar Hypoplasia

- Cows infected at about 150 days of gestation develop fetuses with cerebellar hypoplasia (decreased or arrested growth of the cerebellum of the brain).
- Severely affected calves are blind and unable to stand because of flaccid (relaxed) limb muscles.
- Less severely affected calves stand straddle-legged when lifted, have incoordinated movements, and fall.

Spread

BVD virus is spread by ingestion of feed that has become contaminated with feces or urine from infected animals. Inhaling the virus into the lungs is another means of disease transmission. Rate of spread depends on how closely cattle are confined and how much BVD virus is in the air and available to contaminate feed and water. In a dairy barn with poor ventilation, the disease may affect most animals in 7 to 10 days. On the same farm, outside stock that have plenty of fresh air may not get sick at all or may develop cases at a slow rate. In range

cattle that do not congregate in large groups it may take several weeks to months for the whole herd to contract the disease.

Diagnosis

BVD can be diagnosed by clinical signs, but it must be differentiated from infectious bovine rhinotracheitis and other respiratory and enteric forms of such diseases as vesicular stomatitis and foot and mouth disease. Laboratory confirmation includes virus isolation, fluorescent antibody test, serum neutralization test, and histopathology.

Treatment

There is no specific treatment for BVD. Supportive treatment with digestive tract astringents and fluid therapy may reduce the convalescent period and limit the losses. Antibiotics, sulfas, and other antibacterial drugs frequently are used to combat secondary infections. Treatment may be extensive and yet unsuccessful, depending on the severity of the case.

Prevention

There are two types of products available for the prevention of BVD: modified live virus vaccine and killed virus vaccine. Modified live virus vaccine should not be used on pregnant cows because of the possibility of abortion. With the killed virus vaccine, two shots are necessary to develop good immunity.

If antibody levels in the cow herd are high, early vaccination of calves is not likely to immunize the calf effectively because of the presence of BVD colostrum antibodies. If, on the other hand, antibody levels in the cow herd are low, postponement of vaccination may leave the calves unprotected for a dangerously long period of time. Consult with your veterinarian for a program of preventive immunization that is tailored to your health management practices and the present health status of your herd.

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