

Haskell County Animal Hospital

ANIMAL HEALTH UPDATE

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Bovine Viral Diarrhea - BVD

Part II “The Disease”

BVD disease shows a wide variety of clinical signs in beef cattle. They range from completely sub-clinical, which means the animal shows no signs, to death. This is in part due to the complexity of the virus and multitude of host factors; which include age, nutrition, immune status, concurrent disease, environmental stress factors and many others. The genetic variability of the virus itself leads to a wide spectrum of clinical signs. Reports suggest that as high as 70-90% of BVD infections occur without clinical signs or they are sub-clinical. The 10-30% that show clinical BVD range from mild fever that is hardly evident to a severe, bloody diarrhea that can lead to death in less than 72 hours.

Classical BVD infection's, now called Acute Bovine Viral Diarrhea, primary sign is just as the name implies—diarrhea. Mild cases may only have a slightly loose, abnormal stool. Severe cases have a profuse, watery diarrhea that has a dark greenish/brown appearance. These animals become dehydrated quickly. Some may show blood with the diarrhea. The blood may be very dark or can be bright fresh appearing blood. The amount of blood in the diarrhea also varies from scant amounts to the very obvious large quantities. The severely hemorrhagic form of BVD is caused by a Type II strain and mortality rates from this type can be very high.

Depression is often moderate to severe. Most animals have varying degrees of anorexia. In more severe forms animals are obviously off feed. The rumen will have no fill and the lower abdomen often will have a “full” appearance. This is because these animals tend to drink readily but refuse to eat. The “full” appearance of the lower abdomen is water fill. These animals will “slosh” when made to move. When these animals are posted there is typically very little feed in the digestive tract but large volumes of water.

Ocular and nasal discharge is common and frequently these animals will have a cough. Respiratory rates are often increased. These previous signs mimic pneumonia and often cattle are pulled and treated as respiratory disease when they are actually BVD. BVD calves will often show a biphasic fever early, which is often missed. A high fever will follow in 2-3 days reaching as high as 107 degrees.

As discussed earlier there is a form of BVD called Acute Hemorrhagic BVD. This form is characterized by loss of the animal's ability to clot its blood. This leads to a severely bloody diarrhea, blood coming from the nose, hemorrhages on mucosal surfaces, blood within the eyes and bleeding from injection sites. This syndrome is caused by a Type II strain and is highly fatal. Fortunately, most of the field strains we see are Type I.

Bovine respiratory disease (BRD) is the most common cause of morbidity and mortality in the feedyard. BVD has been implicated as a cause of BRD for many years. Whether it is a direct cause or indirect cause of BRD is arguable. We know that in the United States BVD virus is the

virus most often isolated in outbreaks of BRD. It may have a direct affect on the respiratory system but more importantly I believe these affects are due to the immunosuppressive nature of BVD virus. It has been repeatedly shown that BVD will drastically decrease an animal's immune response. This allows respiratory diseases to invade the lungs and cause their damage. This immunosuppression also allows opportunistic diseases to wreck havoc. This is where diseases like Salmonella, Coccidiosis and Mycoplasma cause great problems- post BVD infection.

BVD virus is uniquely adapted to cattle in its ability to cause persistent infections following fetal exposure to the virus in the first part of gestation. Calves born persistently infected (PI) shed large volumes of virus. Because the virus was in the fetus when its immune system was maturing the calf believes that the virus is part of itself and does not mount an immune response to BVD. Persistently infected (PI) calves can produce some immunity to BVD virus strains that are distant to the strain causing the persistent infection, although not to the degree they would if they were not PI.

Ninety percent of PI calves die before they reach 2 years of age. Current figures suggest that 3% of cattle entering the feedyard are PI's. Studies have shown that some cowherds have as high as a 40-50% incidence of PI calves. If you buy a string of calves from a herd like this you can only imagine the problems you could have. At present, the key to controlling BVD and BVD associated disease is by controlling the PI animal. Unidentified, the PI calf sheds BVD virus to unprotected populations. These unprotected animals immune systems become suppressed opening the door for any opportunistic pathogen to cause disease. Hopefully in the near future we will have cost-effective, chute side test to identify PI calves upon entry into the feedyard. This will help us manage these "virus factories" as to decrease their influence on the total population in the feedyard.

Mucosal disease (MD) is a term used to describe the pathology seen when a PI calf, persistently infected with one biotype of BVD is exposed to the opposite biotype of BVD. This exposure most commonly occurs when the persistent virus mutates from a Non-cytopathic biotype to a Cytopathic biotype. It has been suggested that MLV vaccines which are Cytopathic, cause MD. Although possible this is a very rare occurrence. Mucosal disease (MD) is often described as either acute or chronic. Acute MD only occurs in PI animals and may not affect all PI animals in the group. Those that are affected will have a case fatality rate that approached 100%! MD animals are those that show the typical BVD ulcers along the digestive tract. These ulcers, often linear or oval in shape can occur anywhere along the digestive tract. They are most often identified on the gums, tongue, esophagus or abomasums. Those animals that get MD that do not die acutely are classified as having chronic mucosal disease. These animals remain unthrifty, may have intermittent diarrhea, chronic cough, ocular and nasal discharge and remain in the chronic pen. Animals with chronic mucosal disease can live for up to 18 months but ultimately die from severe debilitation.

As you can see BVD disease is a very complicated syndrome. BVD virus causes many problems from the direct disease itself, but I believe it may be the underlying factor involved in many of the diseases we see when starting cattle. It is these BVD associated diseases we could potentially alleviate if we could ever get a handle on and prevent persistently infected calves.

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