

Bovine Virus Diarrhea (BVD), BVD PI and the new vaccines
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Bovine virus diarrhea (BVD) is a disease caused by a virus that most commonly infects cattle, but also may infect other ruminants such as sheep, goats, and deer. While the virus is classified in several ways, there are two basic types of BVD virus (type 1 and type 2) based on viruses isolated from outbreaks in cattle. The current thinking is that it is advantageous to use both type 1 and type 2 BVD viruses in the vaccine. When BVD was first discovered it was thought to cause diarrhea. We now know that the cattle we diagnosed as BVD were infected as a fetus during gestation and the virus remained in their system throughout their entire life. BVD virus has a unique ability to infect reproductive organs and it can easily cross from the cow, cross the placenta and infect the calf. Because of this, losses to the beef industry from BVD are primarily the result of reproductive failures. We see a decrease in the number of cows that become pregnant, some increased abortions, and some increased stillborns. We see very few cases of diarrhea in cattle from this disease. The reproductive losses are often not massive abortion storms but just poor reproductive performance. Generally, the history is just poor conception rates. Typically, we see herds that have BVD problems with 5-20% less cows settle in a year. However, we have also have seen some cases of BVD in Georgia herds that have severely affected reproduction in beef cattle herds. Examples of real situations in Georgia with BVD problems include a herd with had only 35% of the heifers pregnant after a long breeding period, and another herd had an early abortion rate of 23% in cows that were diagnosed pregnant. These are just samples of the reported cases of BVD in Georgia but many cases go undiagnosed and unreported because the cows do not appear sick, they are just open at the end of the breeding season. BVD is a serious threat to the beef cattle industry in Georgia and you should be concerned as a producer.

To decrease the possibility of infection in a herd BVD should be a part of a routine vaccination program. Vaccinations for BVD do help protect cattle from BVD infection. The new generation of BVD modified live virus vaccines have a label claim for fetal protection and have been approved for use in pregnant cows and calves nursing pregnant cows. In a cow/calf operation, the major economic result of a BVD infection is reproductive failure. It has only been in the last few months that vaccine companies have released products that are proven to protect the fetus. BVD often infects cows but they do not become sick enough to show signs even though the virus is spreading in their body. However, the virus has a unique ability to cross from the cow into the fetus and creates a calf that has a lifetime infection with BVD virus (BVD persistently infected or BVD PI). Depending on the stage of development of the fetus when the cow is infected with BVD, the fetus could just be re-absorbed, aborted, be born BVD PI, or stillborn. At less than 120 days of gestation the fetus might die and you would just see a cow that you thought was bred early be open at the end of the breeding season. At 120 days of gestation or less BVD infection can cause the fetus to die or produce a BVD PI. A BVD PI is only created when a fetus less than 120 days in gestation is infected with BVD virus. Before 120 days old the fetus has not developed an immune system. As it develops the fetal immune system takes an inventory of all the proteins in the body. Viruses are proteins and if BVD virus has infected the calf then the calf's immune system

considers the BVD virus as part of itself and the fetus becomes a BVD PI. Therefore, when the calf is born it has a BVD infection and will never develop resistance to it. These persistently infected calves may look normal but they are shedding BVD virus from every part of their body. When they breathe, urinate or cough they shed BVD to all of the other cattle they are around. These persistently infected calves have been identified as the main source of BVD infection in many cattle herds. It has been estimated that 1.7% of all calves are born BVD PI and about 0.25% are alive at weaning age. When they shed the virus to other cattle the virus has a direct affect on the immune system of the other cattle. It depresses the immune system and makes cattle more susceptible to other infections. This is especially true when these BVD PI cattle expose pregnant cows or commingled calves when they first arrive in a feedlot. One study looked at feedlot pens of cattle that had a BVD PI calf in the pen and compared them to pens with no BVD PI calf in the pen. The BVD PI pens had only about 1-2% of BVD PI calves. The BVD PI pens had poor feed conversion, poor gains, more sick calves, and more dead calves compared to the BVD PI free pens. In cow/calf herds that have one or more BVD PI calves they have poor conception rates and more sickness in the herd.

Most Georgia beef herds do not currently have a BVD problem and should concentrate their efforts on keeping BVD out of their herds by vaccination and testing all purchased cattle or purchasing only tested replacements. BVD PI cattle can look like normal cattle. Before a bull can enter a bull stud they are tested for BVD PI and about ¼ of 1% of them are BVD PI. These are some of the best-looking bulls in the country so you can't always tell by looking. You need to test. Purchasing new cattle is the most common way BVD is brought into a herd. When cattle are purchased, it is recommended they be isolated from all other cattle in your herd for 30 – 60 days. During that time, all new cattle should be vaccinated for BVD, IBR, and Lepto, dewormed, and tested to see if they are persistently infected with BVD, if they have not been previously tested. The test for BVD PI is a highly effective test and needs to be done only once in the animals lifetime. A calf is born BVD PI or not and will never develop BVD PI after birth. BVD PI cattle are shedding so many viruses, that they shed virus from their hair follicles. A skin test can be taken (usually an ear notch) and using special stains you can see the virus in the hair follicle. To prevent introduction of BVD in your herd you should test any herd additions with the BVD ear notch test. Many bull tests, heifer evaluation centers, and some of the more progressive purebred breeders are doing BVD PI testing before the animals sold to insure they are not selling a BVD PI bull or heifer.

If your herd is experiencing a low reproductive rate, you should ask your veterinarian assist you in making a diagnosis of the problem. If you think herd has a BVD problem you can do an inexpensive screen test of the herd by using sentinel calves. Save 10 calves that are 6-8 months of age and have never been vaccinated for BVD. Then have your veterinarian draw blood from these 10 calves and send it to the diagnostic lab for serum antibody tests (SN). If they are all negative for BVD antibodies chances are your problem is not BVD. However, if there is BVD virus floating around in your herd some of these calves will have been exposed to BVD virus and will develop antibodies. If they are positive you may need to do further testing. Research has shown that the single most important factor in controlling BVD is to identify and eliminate persistently infected (BVD PI) calves. This approach was used in Denmark and they have eradicated BVD from the entire county. If you have a BVD problem you will need to search for these BVD PI calves and eliminate them from your herd. This is best accomplished using the BVD skin test (ear notch). Your veterinarian can help you with the protocol for doing the testing. We have excellent testing protocols for BVD and if they can eliminate it from the entire country of Denmark, we should be able to eliminate it from your herd.

BVD can be a serious problem for producers. You can keep it out of your herd by testing purchased bulls and replacements using the ear notch test and by using BVD vaccines in your cowherd. Replacements are best tested using the BVD ear notch test. Current thinking on vaccination is that you need to have both type 1 and type 2 BVD in your vaccine and that modified live virus vaccines may be more protective than killed vaccines. Be sure to use modified live vaccine on your open replacement heifers. The new generation of modified live BVD vaccines has demonstrated protection for the cowherd and protection from fetal infection.

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