Bovine viral diarrhea (BVD) is a disease of cattle that may affect the respiratory, immune, nervous, blood or circulatory, and reproductive systems. Scientists first believed this disease was related to diarrhea and damage to the intestinal tract, hence the name bovine viral diarrhea. About 70 to 90 percent of all BVD infections go undetected. The most economically important consequence of this disease is reproductive loss, which is increasing in the United States.

A virus propagates in one of two ways, “hit and run” or “infect and persist.” In the “hit and run” scenario, when an animal is infected it will either recover or die. An animal infected with BVD usually recovers or dies within about 1 week. BVD would behave this way in a group of stocker or feeder animals. If the infected animal passes the BVD virus along to another animal before it recovers or dies, the virus survives; if it does not, the virus dies out. Animals infected in this way are said to be transiently infected, or temporarily infected for a short time.

BVD also behaves in the “infect and persist” mode because it can be passed from cows to their unborn calves. If they live, these calves will remain infected all their lives and are said to be persistently infected (PI). Understanding BVD persistence is essential to designing an adequate disease control program.

There are two biotypes of the BVD virus, cytopathic (CP) and non-cytopathic (NCP). Non-cytopathic virus predominates in the cattle population and is the biotype responsible for persistent infection.
**Infection during Pregnancy**

Figure 1 depicts the gestation timeline of a cow. During the first 4 months of pregnancy a cow that becomes infected with non-cytopathic BVD may pass the virus to her unborn calf. The calf’s developing body fails to recognize the BVD virus as foreign, so the calf remains persistently infected for life (“infect and persist”).

The major reservoir and source of BVD virus is persistently infected cattle, and this is primarily how the BVD virus remains alive in nature. The PI animal sheds the virus continuously and infects other animals. If the infected animals are not pregnant females, they usually have a relatively short sickness and either recover or die. However, if a pregnant female encounters a PI animal during the first 125 days of gestation, her calf may become persistently infected. If a pregnant female is herself PI, she will always produce PI calves.

Pregnant cattle infected at any time during gestation can abort. Many, but not all, cows infected from 9 days before breeding to 45 days of gestation will miscarry. The virus may infect the reproductive tract and prevent conception or hamper development of the embryo or fetus.

Cows infected between day 100 and day 150 of gestation that do not abort may produce calves with deformities, primarily of the nervous system. These calves often have problems walking, sometimes have problems with eye development, and occasionally lack normal hair development. Growth retardation occurs more rarely.

Cows infected between day 125 and day 150 of gestation may produce normal calves, but the calves are twice as likely as noninfected calves to experience severe illness in the first 10 months of life.

**The Spread of BVD from Farm to Farm**

BVD usually spreads between farms when new cattle are introduced that are persistently infected or are carrying persistently infected calves. BVD is often introduced when infected stocker cattle have contact with pregnant females, either when the groups are com mingled or when they have contact across a fence. Bulls infected with BVD can shed virus in their semen. All bulls purchased should be tested to ensure that they are not infected.

The role of wildlife in the spread of BVD is not certain at this time. BVD does replicate in wild ruminant species such as camels, deer, elk and bison, but it is difficult to predict the importance of wildlife in spreading BVD to cattle populations.

**Symptoms of BVD**

In beef herds, several cows in a herd usually will abort a short time before calving season. At the beginning of calving season, premature births and stillbirths occur. Weak calves are generally born during the first 2 to 4 weeks of calving season. Some calves are born alive but they die quickly. Even with intensive care most infected calves die within a few hours.

Losses tend to be epidemic when BVD is first introduced into a non-immune pregnant herd. Once PI animals establish infection in the herd, losses continue but not as dramatically.

**Controlling BVD**

1. Quarantine all replacement animals for at least 21 days to ensure that they are not temporarily infected with BVD.
   Test all replacement breeding stock, and any animals that may have contact with breeding stock, for PI status.

2. Isolate all new cows that are pregnant until they have calved and all their
calves have been tested for PI status and are found negative. It is important to test these calves before the dams are rebred to eliminate the possibility of producing more PI cattle.

3. Dispose of all PI cattle in an ethical manner. Placing these cattle back in the livestock marketing system, where they may infect other cattle, is irresponsible. Instead, infected cattle should be euthanized, sent directly to slaughter, or fed in isolated pens.

4. Vaccination can prevent or slow the “hit and run” version of the BVD virus that produces temporary disease. Vaccinating cows to prevent the infection of calves, and thus the birth of PI cattle, is helpful but not 100 percent effective.

5. Establish a biosecurity and vaccination program that is tailored to your operation, with advice from your veterinarian. The timing of vaccination and the choice of vaccine (modified live vs. killed) are management decisions that will vary with individual operations. Always follow label instructions and Beef Quality Assurance Guidelines when using any vaccine.

References:


