BOVINE VIRAL DIARRHEA VIRUS

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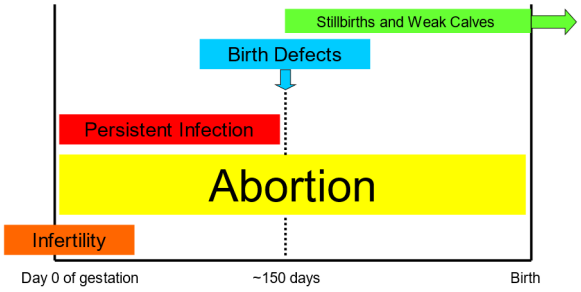
Bovine viral diarrhea virus (BVDV) is a potentially severe problem for cow-calf herds and has been implicated as a cause of infertility, abortions, diarrhea, shipping fever (bovine respiratory disease) and immunosuppression, which weakens the immune system and leads to other disease issues. BVDV infections are classified into three clinical syndromes: acute (transient) infections, fetal infections and persistent infections.

ACUTE INFECTIONS

Acute (transient) infections can result in fever, depression, diarrhea, respiratory disease, reproductive problems and much more depending on the age and immune status of the animal infected, as well as the strain of BVDV involved. Some animals will show no outward signs of illness (subclinical disease), but the immunosuppressive effect of the virus weakens the immune system and leaves them susceptible to other diseases. Most animals recover from acute infections, but some animals may die.

Reproductive consequences of acute (transient) BVDV infections in cows and heifers



FETAL INFECTIONS

Acute BVDV infections can occur in a beef cow or heifer, but often with no outward signs of illness (subclinical). However, if she is pregnant, her fetus can become infected and experience a variety of consequences. Fetal infections can occur anytime a fetus is exposed to BVDV, but the consequences vary depending on the strain of the virus and the stage of gestation (pregnancy). Abortions can occur throughout gestation, but birth defects and persistent infections occur during specific periods:

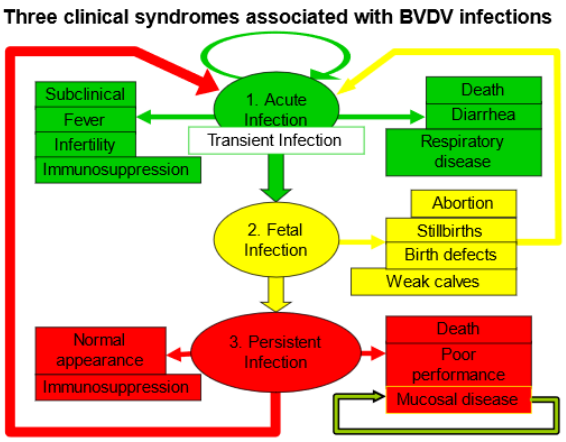
1. Infection during the breeding season could result in infertility or early embryonic death.
2. Infection during the first half of gestation could result in abortions or the birth of persistently infected calves.
3. Infection during the second half of gestation could result in abortions, birth defects, stillbirths or weak calves.

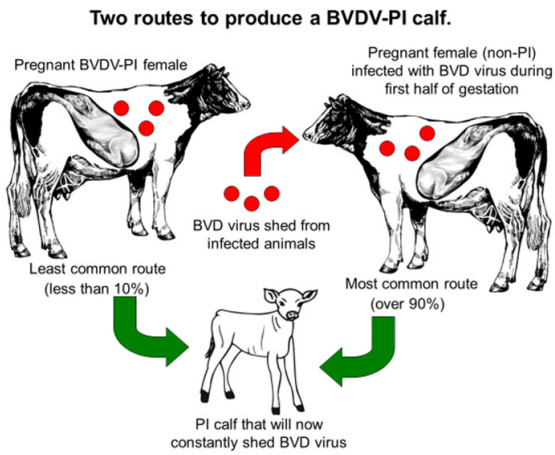
PERSISTENT INFECTIONS

Persistently infected (PI) calves are created when a fetus is exposed to BVDV during the first half of gestation. During this time, the fetal immune system is not developed enough to respond to a BVDV infection. The fetus might be aborted, but, if the fetus survives, it will likely develop into a PI calf. Some PI calves are "poor doers," while others may look healthy and grow very well, making it impossible to consistently detect PI animals visually. Most PI animals die by 2 years of age, but some will survive for several years and constantly shed BVDV throughout their lives. The prevalence of PI animals is relatively low (0.4 percent to 2 percent), but their ability to shed virus to other animals is tremendous.

TRANSMISSION

BVDV does not usually survive in the environment for lengthy periods (less than three weeks), so direct transmission between animals is the most common route of transmission. Acutely infected animals are a temporary source of BVDV transmission, but PI animals shed millions of viral particles every day. PI animals therefore serve as a constant source of BVDV exposure





in a herd because they continuously shed virus in saliva, mucous, tears, milk, feces, urine and any other bodily secretion. Infected herds must therefore identify PI animals and remove them from the herd.

BVDV CONTROL

Control of BVDV currently involves a combination of biosecurity, diagnostic surveillance and vaccination. Specific BVDV diagnostic testing protocols will differ from one operation to the next depending on herd goals, herd health history, BVDV exposure risk factors, etc. Work with your veterinarian to determine the best BVDV testing strategy for your herd.

DIAGNOSTIC SURVEILLANCE

BVDV does not usually survive in the environment for long (less than three weeks), so direct transmission between animals is the most common route of transmission. Animals that are born persistently infected (PI) with the virus shed millions of viral particles every day and serve as a constant source of BVDV exposure in a herd because they continuously shed virus in saliva, mucous, tears, milk, feces, urine and any other bodily secretion. Infected herds must therefore identify PI animals and remove them from the herd, and uninfected herds must prevent introducing PI animals into the herd. Some PI animals will be "poor doers," but about 50 percent will look and perform like non-PI animals. Because PI animals cannot be consistently identified visually, they must be identified with appropriate diagnostic tests.

Several tests are available to diagnose PI animals such as virus isolation, antigen capture ELISA, PCR, immunohistochemistry (IHC) and serology. The type of test your veterinarian will recommend depends on the age, vaccination status and previous test results of the animal. The best initial screening test available in terms of accuracy, cost and convenience is the antigen capture ELISA performed on a skin biopsy (i.e., ear-notch sample), which can be performed on newborn animals as well as adults. This test is available at the C.E. Kord Animal Health Diagnostic Lab (Ellington). If you have an animal that tests positive as a PI, contact your veterinarian to discuss potential follow-up diagnostics to confirm the positive result in your herd.

BIOSECURITY

Biosecurity is an innovative approach to managing the risk of disease introduction to your livestock operation. Work with your veterinarian or UT Extension agent to develop a biosecurity plan to help identify and manage disease risks through practical measures for common, everyday infectious agents such as BVDV. An effective biosecurity plan involves multiple components, but results in practical measures for implementation.

The following are examples of biosecurity practices that will minimize the risk of BVDV introduction:

1. Do not intentionally commingle animals from different herds.
2. Provide a buffer between adjoining herds so no fence-line contact is available.
3. Isolate new herd additions and test for appropriate diseases such as BVDV before allowing new animals to commingle with your herd. Identify isolation areas before purchase.
4. Isolate animals for a designated period that are returning to the herd from livestock shows and other events.
5. Post signs indicating that a biosecurity plan is in effect for your operation.
6. Educate all visitors about the biosecurity plan in effect for your operation.

7. Ensure that all visitors are dressed appropriately. Provide coveralls and boots, or make sure visitors are wearing clothing free from contact with other cattle.
8. Recognize the fact that you are also a source of contamination for your herd. If you are around other cattle, shower and change clothes before working with your livestock.
9. Clean and disinfect your truck and trailer after hauling cattle. Anyone hauling cattle for you should do the same.
10. Apply appropriate insect control.

VACCINATION

Vaccination is a critical component of BVDV control. Many effective vaccines exist that contain BVDV and other common infectious agents. However, because so many strains of BVDV exist, no vaccine is 100 percent effective against all strains. Therefore, do not rely entirely on vaccination to protect your herd from BVDV. Instead, be sure to include appropriate diagnostic surveillance and biosecurity tailored to meet the individual needs of your operation.

Specific BVDV control strategies will differ from one operation to the next depending on herd goals, herd health history, BVDV exposure risk factors, etc. Consult with your veterinarian, fellow producers and UT Extension specialists to determine the best BVDV control strategy for your herd.

REFERENCES:

Large Animal Internal Medicine, 5th Edition, Bradford P. Smith

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