Bovine viral diarrhea virus (BVDV) is a potentially serious problem for cow-calf herds and has been implicated as a cause of infertility, abortions, diarrhea, respiratory disease (shipping fever), weakening of the immune system, which increases susceptibility to other diseases (immunosuppression), and much more. BVDV infections are classified into three clinical syndromes: acute (transient) infection, fetal infection, and persistent infection (figure 1).

**Fetal Infections**

The majority of acute BVDV infections in cows and heifers are subclinical, but if a cow or heifer is pregnant her fetus can become infected, resulting in a variety of consequences. Fetal infections can occur any time a fetus is exposed to BVDV, but the result varies depending on the strain of virus and the stage of pregnancy (gestation). Abortions can occur throughout gestation, but birth defects and persistent infections occur during specific periods of gestation (figure 2):

- Infection during the breeding season could result in infertility or early embryonic death.
- Infection during the first half of gestation could result in abortions or the birth of persistently infected calves.
- Infection during the second half of gestation could result in abortions, birth defects, stillbirths, or weak calves, but not persistently infected calves.

**Acute Infections**

Acute (transient) infections only last from a few days to a couple weeks but can result in fever, 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 a BVDV infection (subclinical disease), but the immunosuppressive effects of the virus weaken the immune system leaving them susceptible to other diseases. Most animals recover from acute infections in a couple of weeks, but some animals will die.
Viral Classification

Vaccines containing BVDV often use different terms to describe the type of BVDV used to manufacture the vaccine. Therefore, it can be helpful to understand some of the terminology. Scientists classify BVDV according to genotype (type 1 and type 2) and biotype (cytopathic and noncytopathic) based upon genetic composition (genotype) and how the virus affects culture cells in the laboratory (biotype). Both type 1 and type 2 genotypes contain cytopathic and noncytopathic biotypes. Type 1 and type 2 also mutate very frequently, creating many different strains of BVDV. Some strains cause more severe disease than others, but the important point to remember is that all strains of BVDV, regardless of genotype and biotype, are capable of causing disease. Also, because so many strains of BVDV exist, no vaccine is 100 percent effective against all strains.

Transmission

BVDV does not usually survive in the environment very long (less than 3 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 (figure 4).
BVDV Control

Control of BVDV currently involves a combination of biosecurity, testing and culling of PI animals (diagnostic surveillance), and vaccination. Specific BVDV control protocols will differ from one cattle farm to the next depending on herd goals, herd health history, BVDV exposure risk factors, etc. Work with your veterinarian and Extension agent to create an effective BVDV control program tailored to your farm.

Figure 4. A PI calf constantly exposes herdmates to BVDV via saliva, urine, feces, tears, mucous, and any other bodily secretion.