BVD in the feedlot:

Control Starts *on the* Ranch

Animals exposed to BVD after birth may become infected and be contagious for a few days, but an animal that is persistently infected with the virus will shed the virus every day — for as long as it lives. [PHOTOS COURTESY OF GUY LONERAGAN]

Story by
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If you've been in or around the cattle business for any length of time, you've heard of bovine viral diarrhea, or BVD. It's not a new malady, but it might be a bigger problem than producers, and even some veterinarians, had previously thought. Certainly it presents challenges for all production segments of the beef industry — from cow-calf to feedlot.

Dan Thomson says his veterinarian father started worrying about BVD and its impact on cow-calf producers served by his Iowa practice years ago. Thomson, himself a veterinarian for Cactus Feeders, Amarillo, Texas, now frets about how BVD burdens cattle feeders. And he has conducted considerable BVD-related research with Guy Loneragan, epidemiologist for the feedlot research group at West Texas A&M University. There is insufficient data for iron-clad proof, but Thomson suspects that as many as 30% of total feedlot deaths could be BVD-related.

A primary source of BVD in the feedlot is persistently infected (PI) cattle that, upon arrival, already harbor the virus. Unfortunately, PI calves often are difficult to identify without performing laboratory tests. According to Thomson, PI calves may appear to be perfectly normal, or show only subtle signs that something is not quite right. They might walk off the trucks looking like "poor doers," but not necessarily.

"We've seen animals that were beautiful coming in, and later took on that rough-haired, anorexic look," Thomson explains. "In some, it shows up during the first two weeks in the feedlot. Those cattle usually die within four weeks. In other cattle, it may not show up until later, after they've been on feed for up to 90 days."

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PI calves in the feedlot

The name *bovine viral diarrhea* is misleading because infected animals may never have diarrhea. The virus is insidious in that it suppresses the immune system, increasing susceptibility to other infections. BVD is known to cause infertility and fetal infection during pregnancy, which may lead to early embryonic death or abortion. An infected fetus that survives to term can result in the birth of a calf that is stunted, exhibits physical defects, or is persistently infected with the virus.

A PI calf is infected for its entire life, harboring large numbers of viral organisms in its body. Any animal exposed to the BVD virus after birth may become infected and be contagious for a few days, but a PI animal will shed the virus every day — for as long as it lives. An estimated 20% to 50% of PI calves die before reaching weaning age. Those that survive can appear to be normal, exhibiting normal growth rates beyond weaning. While the PI calves that enter the feedlot represent a small portion of the population, they are virus factories that do plenty of damage.

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According to Loneragan, research suggests that two to four animals per 1,000 head entering the feedlot are persistently infected. Not only are these animals likely to become chronically sick, then die, they expose penmates to infection. If those cattle develop acute infections, they shed the virus and increase exposure to more animals.

"One animal can have a big impact," Loneragan states. "The presence of one PI animal in a pen can result in a 10% to 40% higher incidence of disease in that pen of cattle."

An accurate laboratory test for identifying PI animals involves analysis of a small skin sample taken from the ear. The test can differentiate a PI calf, which will always carry the virus, from an animal infected with BVD after birth, which could clear the virus from its body. At Cactus Feeders, 10,000 head of cattle have been earnotched and tested for research purposes.

"I'd say that one PI calf can increase the number of cattle pulled for treatment by about 30%. It also increases pulls in adjacent pens, especially if the pens share fenceline waterers," Thomson adds.

The domino effect is potentially devastating in a feedlot, says Idaho veterinarian Tom Shelton. Also a technical advisor for Intervet Inc., Shelton believes BVD may be the most significant pathogen challenging the U.S. beef industry, mainly because it suppresses immune function and opens the door to a host of respiratory and enteric infections.

"You name the disease, and it's worse because of BVD," Shelton states. "When an animal is infected with BVD, it is more susceptible to BRSV (bovine respiratory syncytial virus), IBR (infectious bovine rhinotracheitis), salmonella, mycoplasma, and the list goes on."

Is type 2 worse than type 1?

Complicating the issue are BVD's multiple biotypes. Shelton says type 1 and type 2 are genetically distinct organisms. And he is convinced that type 2 is a major reason why the industry is not gaining much ground in its attempt to control viral respiratory disease.

"Type 2 is the new kid on the block," Shelton states. "It is emerging everywhere in the face of type 1 vaccines. That means that even in cow herds vaccinated for type 1, it's possible to produce PI calves. And we still see abortions, stillbirths and weak calves."

Type 2 may be the new kid, but is it the biggest bully? Not all experts agree.

"I'm not sure there is much difference in the virulence of type 1 and type 2. Some studies suggest that type 1 is more often associated with respiratory disease," Loneragan offers. "In my opinion, they are fairly equal."

Should producers vaccinate for both? Loneragan believes some degree of cross protection is achieved with a vaccine containing one strain, but he advises producers to consult their veterinarian.

"We don't know yet to what extent feedlot losses may be attributed to BVD. We are sure that it is costing more than we ever imagined," Loneragan adds. "Still, we have to stress that the biggest economic loss is reproductive."

Adopting a BVD biosecurity program

Cattle at the highest risk for losses from BVD infections are pregnant females, but also at risk are cattle under 6 months of age whose immune response may be suppressed by BVD. Loneragan and Thomson stress that reduction of these losses, as well as reduction of sources of exposure (PI cattle) in the feedlot, has to begin with management strategies applied to the cow herd.

University of Nebraska research veterinarian Clayton Kelling agrees, advising cow-calf producers to adopt a BVD biosecurity program involving three principles:

(1) enhancement of immunity;
(2) prevention of exposure to at-risk animals; and
(3) elimination of PI carriers from the herd.

Enhancement of immunity means vaccination. However, in a report published in the January 2000 issue of *The Bovine Practitioner*, Kelling says the ability of a vaccination to reliably protect a fetus against BVD infection has been questioned. Some studies have demonstrated a reasonable degree of protection against fetal infection using a modified-live virus (MLV) vaccine, and partial protection using an inactivated or "killed" vaccine. No vaccine can promise complete protection, hence the need for measures to avoid exposure and to eliminate PI cattle from the herd.

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— Clayton Kelling

Kelling advises producers to be practical. If herd history does not indicate that BVD is a problem, the most economical approach might include screening the bulls and females added to the herd, as well as establishing a regular vaccination schedule. Kelling says purchasing tested nonpregnant females is less risky than buying tested females that are pregnant. Even when tested and found to be free of BVD, a heifer or cow could be carrying a PI calf.

When BVD is known to exist in a herd, the possible presence of PI animals must be considered. Stringent herd testing may be required to identify and eliminate them. In this situation, Kelling says, seedstock producers should be particularly aggressive about eliminating PI animals and maintaining a sound vaccination program.

"Right now, BVD may be the most important viral problem in North America," Kelling offers. "But part of the problem could be the way vaccines are used. Sometimes vaccination occurs at the manager's convenience, and administration procedures may be less than optimal. We have to follow the label and administer vaccines correctly."

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