

Three Little Words

Lack of understanding, incentives at the cow-calf level may be the reasons BVD continues to prevail.

by *Shelby Mettlen*, assistant editor

Bovine viral diarrhea. Those three words have been leaving big question marks over the heads of producers, veterinarians, cattle feeders and animal health experts, and big holes in the pockets of cattle-market players since the 1980s. Cattle industry professionals agree: Bovine viral diarrhea (BVD) is a problem, and we still haven't fixed it.

Dan Grooms, veterinarian with Michigan State University's College of Veterinary Medicine, said as much at the National Institute for Animal Agriculture (NIAA) BVD Forum April 7 in Kansas City, Mo.

Grooms' message was that we should continue to educate the industry about BVD, continue dialogue within the industry focusing on control methods and implement cost-effective control programs for the disease.

BVD is an RNA virus and can mutate and change rapidly, Grooms reminded his audience. "It is associated with many different clinical outcomes, not just diarrhea," he said.

The virus can present itself in a variety of ways, or not at all. Transient, or acute, infection can cause immunosuppression, leading to secondary problems such as respiratory disease. Conversely, a transiently infected animal may show no signs of infection at all.

If a pregnant cow becomes transiently infected, the virus can cause early embryonic deaths, abortions or congenital defects. If she becomes infected during the fragile window of gestation between 20 and 125 days, there is a high risk of the fetus and subsequent calf being persistently infected (PI) with BVD. This is where the real trouble starts.

Persistent infection

PI calves are the main source of BVD transmission in the cattle population, Grooms said. These calves become lifetime carriers and shedders of the virus. They express the virus at extremely high titers in blood, excretions or secretions, and in tissues. PI calves may appear normal, but Grooms said they're typically your herd's poor performers, and survivability is generally low.

In a 10-year farm profitability model of

herds with a PI animal present, researchers saw an average 5% reduction in pregnancy rates, a 10% increase in preweaning mortality, decreased weaning weights and a loss of between \$40 and \$92 in the feedlot.

Morbidity nearly doubled in high-risk feedlot calves exposed to PI calves, data indicated. However, he pointed out, not all studies show that BVD affects performance.

"There's a great deal of variability," he said. "That demonstrates we have lots to learn about the virus."

He noted that there has been momentum in the industry to control BVD for the past 15 years. For example, the Michigan Cattlemen's Bull Test and a number of other bull tests across the country require bulls to test negative for persistent infection. The National Western Stock Show (NWSS) requires sale and show cattle to test negative for persistent infection, and many European countries have eradication programs in place.

"We need to understand the goals and objectives for a BVD control program at the farm level," Grooms said.

Control requires more than just vaccinating. Grooms said there are three components to an effective BVD control program: biosecurity, elimination of PI animals and improvement of herd immunity.

"[PI animals] are the most wanted," Grooms said. "They are the dangerous criminals in my mind."

Testing for persistent infection

Diagnostic testing. Those are two more little words producers, particularly cow-calf producers, don't like to hear.

Testing for BVD is the first step in implementing an effective BVD control plan at the farm level, and it's one step many cow-calf producers are failing to take, Grooms said.

The most important step toward protecting herds from PI animals is making sure the fetus is not infected during gestation, he said. "We need to protect that fetus against infection."

He noted there are several avenues of BVD detection, including immunoperoxidase monolayer assay (IPMA), enzyme-linked immunosorbent assay (ELISA), polymerase

chain reaction (PCR) and immunohistochemistry (IHC) tests. There are more than 150 vaccine combinations available to producers, including modified-live-virus (MLV) and killed vaccines, vaccines containing multiple viruses, and vaccines that can be used at various management times.

"We have effective tools to help control this virus," Grooms said.

Finding incentives

If BVD control efforts really need to start with the cow-calf producer, why aren't these guys testing? Derrell Peel, ag economist with Oklahoma State University, said it could be one of two things: a lack of knowledge or a lack of incentive.

"An awful lot of the loss or impact here is probably not even recognized by producers," Peel said. "You're not going to control something if you don't recognize the disease. If you're not looking at the ones that die, you won't know that's what the problem was."

The real challenge comes from a systems and economic standpoint, he said.

"A big part of it for many producers is failure to recognize the disease," Peel said. "Incidence rates are low; that's probably masking the issue in some ways. It's built into our production benchmarks. That's going to be a challenge to any sort of control program."

Peel said there's not a lot of incentive at the cow-calf level to identify the disease.

"Sometimes it's convenient to not know," he said. "Go back to tuberculosis and Bang's testing. Sometimes the incentive was to sell them just as quick as you could."

Working at the margin

For a decision to be profitable, marginal benefits must outweigh marginal costs. Because one animal in a herd or feedlot can affect the entire population, Peel said it's more important to focus on the issue at the management level, rather than the individual animal level. Entertaining the notion of eradication, he said, marginal costs will likely outweigh marginal benefits in terms of purely private perspectives. However, he noted that there are collective benefits to the industry

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that outweigh what producers, individually, can realize.

The benefits are there, in total, he said. We just need to figure out how to capture them.

“There’s probably a lot of testing being done at the feedlot level,” Peel said, an assumption immediately verified by several feedlot producers in the audience, one of whom later took the stage as part of the producer panel and said he tests “every calf that comes off that truck.”

“It would seem that the impacts at the cow-calf level would be significant enough that [cow-calf producers] would be testing,” Peel said. “I would estimate that at that level, it’s a lack of awareness.”

An educational effort at the cow-calf level might be a good first approach to turn the situation around, Peel said.

Testing woes

Dan Givens, veterinarian with Auburn University’s College of Veterinary Medicine, took a closer look at the psychology of the matter.

The cow-calf producer has no effective way to test a calf for BVD until it hits the ground. He or she already has nine months tied up into production of the animal, Givens said. They’re six months away from rolling out the end product. What the industry is asking the cow-calf producer to do is to stop the production process halfway through, test the product and take the loss for not passing it on to the market, should the calf happen to test positive for BVD.

“The psychology of the system is really interesting,” he said. “In the back of their minds, every time they test and it comes back negative, there’s something that says, ‘Why did I test?’”

Think about what we’re asking this sector of the industry to do, he said. If a producer spends \$3-\$5 per cow on tests to locate one PI animal in a herd of 200 cows and has none, he feels like he’s wasted his money. If he does find a PI animal, now he’s got a whole new set of problems on his hands. While it helps the industry overall, it sounds like a whole lot of trouble to the cow-calf producer.

BVD testing takes time and money, two things producers aren’t keen on giving up. Peel threw around the idea of an incentive program, but Givens said the intent to test is not the same as testing.

In a study, producers were asked if they would test their cattle for BVD if the tests were provided to them free of charge. Givens said 306 producers inquired, saying, if you’re

Testing tips

While calves persistently infected (PI) with bovine viral diarrhea (BVD) are usually poor performers that die young, they’re usually in the herd long enough to infect other animals. They aren’t always your sick calves, said Dan Grooms, veterinarian with Michigan State University’s College of Veterinary Medicine. They can fly under the radar and cause a real headache for you and your operation.

A veterinarian with Auburn University’s College of Veterinary Medicine, Dan Givens listed three main reasons why testing your animals is important to the health of your cow herd, your neighbor’s cow herd and the nation’s cow herd.

- ▶ It increases market value of animals.
- ▶ It ensures that a herd is free of PI animals.
- ▶ It identifies individual PI animals that are spreading disease within a herd or group.

He noted that the greatest testing accuracy and reliability comes with significant labor, expense and time.

Knowledge of the disease and likeliness to test appear to correlate with size of operation, Givens said. In a 2008 study, only 4.2% of producers with fewer than 200 head of cattle indicated they were knowledgeable about BVD and tested for the disease in the past three years. That percentage increased to 15.6% in operations with more than 200 head. Still, 25.2% and 41.8%, respectively, indicated they were knowledgeable of the disease but hadn’t tested.

Something else to keep in mind: 93% of PI calves don’t belong to a PI dam. The numbers would indicate that only 7% of PI calves do have a dam that is PI, Givens said. That leaves a whole slew of calves that became contaminated during gestation in a transiently infected dam.

Averages across the country’s cow herd could be masking the problem, noted Derrell Peel, Oklahoma State University ag economist. Givens said only about 4 in 1,000 animals are PI animals, indicating that it really is a matter of finding and isolating a relatively small set of animals.

Peel said having the records that might help to identify those hot spots or concentrations of infected animals is important.

“You would have to test a lot of animals to pick up a 10% increase in those animals,” he said. “To know what their own benchmarks really are, it will be easier to detect changes that would be indicative of a problem.”

The bottom line, Peel said, is identifying those animals and getting them out of the herd as soon as possible. Producers also need to be sure to cover all three aspects of a control program: testing, vaccinations, and biosecurity or biocontainment.

“If you do testing and vaccinations and you don’t do biosecurity, it’s an ongoing thing,” Peel added.

When and which cattle should you test?

Givens said producers should institute testing of calves and introduce herd additions before breeding season (November to December in the southeast), and to be aware of that time frame and keep a controlled breeding season.

A few things to note:

- ▶ Calves on the ground, bulls on the operation and cattle without calves should be tested.
- ▶ A PI cow will always produce a PI calf. If you test a calf and it is negative for BVD, to the degree that you have records, the dam of that calf is negative.
- ▶ Bulls and cattle without calves that test positive for persistent infection should be sold for immediate slaughter.
- ▶ Calves and dams that test positive should be pulled from the herd.
- ▶ Calves that test positive should be sold for immediate slaughter or maintained in an isolated manner to reach slaughter weight.
- ▶ If a cow tests positive and has a positive calf (PI calf product of PI cow), the animal should be sold for slaughter.
- ▶ If a cow tests negative and has a positive calf (PI calf from acute infection) only the cow may return to the herd.

paying, we want to test. Only 205 of those producers submitted samples, meaning only 67% of producers who were provided BVD testing supplies free of charge actually submitted samples.

In other cases, Givens said he has encountered producers who test their cattle, identify PI animals and don’t remove them from the herd. To that, he said, “Why did we test?”

It is a rewarding test, Givens said, but it is

not a foolproof test. The take-home message? All tests can be performed accurately and reliably, with a little bit of work.

“The foundation is critical,” he said. “This is not a one-part methodology. You have to survey to detect the disease, implement biocontainment to affect or biosecurity to protect against it, and vaccinate to keep the disease in check.”

