

Test to Control

BVD remains a pesky, costly cattle health challenge.

by *Heather Smith Thomas*

Calves persistently infected (PI) with the bovine viral diarrhea (BVD) virus are the Trojan horse of the beef industry, sneaking the costly virus into cattle operations.

“This virus can cause immune dysfunction; some strains cause the immune system to overreact when cattle are stressed, such as at weaning,” explains Chris Chase, DVM, South Dakota State University. “If calves are subjected to stress and have BVD at the same time, it makes them much more susceptible to any respiratory diseases, coccidiosis or whatever else they might be exposed to.”

Diagnosing BVD without testing is difficult because symptoms often mimic other diseases. BVD can cause abortion, fetal mummification, birth defects and malformations, stillborn full-term calves, PI calves with immune deficiencies, and acute or chronic illness with a variety of signs. This virus is also an indirect cause of many other diseases because it hinders the immune system. Pinkeye, scours and other maladies can occur because BVD lowered the animal’s defenses, allowing another infection to get started.

Types of infection

PI animals are infected in utero as a fetus by a BVD infected dam during early pregnancy. PI animals shed the virus as long as they live.

“Most persistently infected calves don’t live long enough

to become adults, but some do. They continually shed the virus and are super-shedders,” Chase says.

Cattle infected with BVD after birth are regarded as acutely infected or transiently infected (TI). After TI animals clear the infection and recover, they no longer shed the virus.

“Even if cattle are vaccinated, it won’t always protect them,” Chase says. “If some get stressed, their immune response to pathogens may be inadequate. If they have close contact with a PI animal on the day they are stressed, they may become infected.”

While the BVD virus can be transmitted from cattle with BVD (TI), most transmission within herds stem from PI transmission, according to Cheryl Waldner, DVM, University of Saskatchewan. Consequently, she says controlling BVD requires preventing the birth of PI calves.

Testing is key

“Doing some blood tests in the cows and measuring antibodies can reveal their immune status. With many diseases, antibody levels are usually not a good indicator of whether or not a herd has been infected, but with BVD, it is,” Chase says. “Antibody levels in an infected animal are much higher than what we’d see with an animal that has been vaccinated.” Taking a few blood samples now and then can be a way to monitor BVD status of a herd.

If your cattle come into contact with other cattle, such as in a community pasture, Chase suggests checking all of your calves the next year by sending ear notch samples to check for BVD.

“You might have had a clean herd, but when a cow is pregnant, if she is exposed to this virus at a certain stage during the first 120 days of gestation, even if she’s been vaccinated, there is still some risk. If she has contact with a PI animal in someone else’s herd, she may be vulnerable,” Chase says.

You probably wouldn’t know her calf is PI unless you test it, according to Waldner.

“You might suspect a calf could be PI if he’s a little smaller and a poor doer, but there can also be calves, young cows or bulls that look healthy and are persistently infected,” Waldner says.

Chase advises producers to test. If they have a relatively closed herd (not much contact or co-mingling with other cattle) it might not be necessary to ear notch all the calves every year.

“But the advantage of testing all calves each year is that the PI animals can be identified and eliminated,” Chase explains.

Biosecurity is crucial, but difficult with community pastures or fence-line contact, especially if your neighbor brings in new animals.

“When you buy new stock, test and quarantine before you add them to your herd,” Chase recommends. “If it’s a

reputable seller who tested the cattle just prior to when you get them — and they don’t go through a sale barn or any place they might be in contact with other animals — you may not need to quarantine them. But if you buy animals you are unsure about, quarantine them for 30 days.”

Chase suggests pulling a blood sample when the animal arrives, quarantining it and then pulling another sample 30 days later.

“If the animal has never been tested, I recommend doing the ear notch when it arrives to make sure it is not PI,” Chase says. “If it’s not PI, a blood sample upon arrival and another one 30 days later will tell if it was exposed and became infected before it got to your place. The virus runs its course, and most animals will clear the virus within 30 days,” he says.

Further, Chase says it is important to take ear notches if there are several unexplained deaths in a herd or feedlot.

“Animals found down or dead might not show anything at necropsy, but could be PI animals,” Chase explains. “Even if you see something else wrong, it’s wise to do an ear notch test to be on the safe side and know whether the animal was PI.”

“If you tested the rest of the herd, you might not think there’s a problem if all the animals tested were clean, but if you forget about the one that died (and didn’t have it tested), it could have been a

PI, creating some exposure in the herd.”

Keep in mind the number of PI animals in beef herds has increased over the past several years, according to Chase.

“Part of the reason is that we are not monitoring for BVD as much as we did earlier, and there is a strain called BVD1b that may have

become more prevalent,” Chase says. “Most of our vaccines are pretty good against BVDV1a and 2a because those are the two original strains we knew about. Now BVDV1b has emerged, and it’s different. Viruses keep changing and always seem to figure out a way to evade control.”

Work with your herd health veterinarian to assess and manage BVD risk.

“Many people think that if they just vaccinate, everything will be OK. But if you don’t eliminate PI animals, you can’t vaccinate your way out of a BVD problem,” Chase says. **BA**

Editor’s Note: Heather Smith Thomas and her husband, Lynn, have ranched near Salmon, Idaho, for more than four decades. She also writes cattle articles that appear in numerous U.S. and Canadian cattle publications, including *Hereford World*. She is the author of numerous books, including “The Cattle Health Handbook.”

BVD Testing Options

Several tests exist to diagnose BVD (bovine viral diarrhea), according to Gregg Hanzlicek, DVM, Kansas State University Veterinary Diagnostic Laboratory. He assists veterinarians investigating complex herd health problems and works with pathologists and microbiologists.

“We are looking for carriers, so the tests we use are looking for the organism itself,” Hanzlicek says.

Immunochemistry is one of the tests. It utilizes tissue samples, chemical reaction and examining the sample microscopically.

“There are also a couple of ELISA (enzyme-linked immunoassay) tests. One is called an antigen-capture ELISA. This test sets up a reaction between the virus in the sample and the antibody to the virus contained in the test kit,” Hanzlicek explains. “If the virus is present, it causes a reaction that can be visually seen. Another ELISA test is the BVD SNAP test. It can be completed chute-side, with results in a few minutes.”

PCR (polymerase chain reaction) represents the most recent testing technology.

“One advantage is that it can quantify the amount of virus in the sample,” Hanzlicek says. “By using the PCR and assessing the number on the test result, we have a good idea whether that animal is a PI (permanently infected) or a TI (transiently infected) animal. But it’s still wise to retest to see if the animal cleared up or is still harboring the virus.”

Next steps

“If you have an animal with a positive test result, you should probably quarantine and retest that animal in three to four weeks because both the ELISA and the PCR find not only the cattle that are persistently infected, but also animals that are transiently infected,” Hanzlicek explains. “Those transiently infected animals will fight off the infection and no longer be shedding any virus, usually within a few weeks.

“People think it’s a hassle to retest in three to four weeks, but it’s best to remove both PI and TI animals from the group. A TI on the retest will be negative; it would then be safe to put those cattle back in the herd. By contrast, PI cattle should be sold to slaughter ... whether the virus exposure is coming from a PI or TI makes no difference to the calf or cow that is exposed.”

Test samples can be ear notches or blood.

“Most people submit ear notches because they are easier to collect than a blood sample. Once you ear notch the animals you can also tell by looking at them that they’ve had the BVD test,” Hanzlicek notes.

However, he also says there are cases where unscrupulous sellers ear notch untested cattle to make buyers think the cattle were tested.

“This passes the disease to someone else,” Hanzlicek emphasizes. “Our lab tests loads of calves as they come into the Midwest and some have been found to contain multiple PI calves. In some of these situations you know someone put PI calves together and sold them as a group.”

To pool or not

Pooling diagnostic samples has advantages and disadvantages when sending samples to be tested.

“Typically, people request pooling for PCR tests to reduce cost. Pooling PCR samples can reduce the cost down to the ELISA cost or even less,” Hanzlicek explains.

However, if the lab finds a positive pool, then all animals in the pooled group must be re-tested to find the BVD-positive animals. So, he says don’t pool samples unless you are sure there are few, if any, PI animals represented.

“If you know there might be PI animals, request the test be completed individually or in small groups of six,” Hanzlicek suggests.

Testing protocol

“If you can’t sample all your calves at once, put labeled ear notches in the freezer as you collect them. Each notch should be submitted in a separate container such as a Ziploc bag. You can send them as a group later for testing,” says Hanzlicek.

If you suspect BVD in a cow-calf herd, test the youngest animals first.

“Make sure you are testing calves before bull turnout or AI,” Hanzlicek says. “If there’s a PI calf in the herd during breeding season, it will be shedding virus, potentially transmitting it to bred cows in early gestation; you could end up with more PI calves born the next year. To find PI calves or screen for BVD, take an ear notch from every calf at birth or shortly afterward.”

If you find a PI calf, test the dam to make sure she is not PI, even though 97% of PI calves are born from TI dams infected during the first four months of gestation.

“These dams were temporarily infected at the wrong time of pregnancy,” Hanzlicek explains. “People often think PI calves are coming from PI dams, but that’s generally not the case.”

Finally, Hanzlicek says folks bringing calves to feedlots or stocker facilities should make sure none are PI.

“It’s best to test before they go on the truck, but that’s usually not practical, especially if calves are coming from sale barns,” Hanzlicek says. “They should be tested upon arrival, especially calves coming from areas where previous PI animals were diagnosed. With many of the tests, especially the PCR, results can be obtained within less than 24 hours. You can know the BVD status of those calves before exposing other calves.” **BA**