

Guidelines to Develop a Whole-Herd BVD Testing Program

Margins are tight for many dairies and will probably remain so given today's economic realities. Therefore, it's easy to put off, eliminate or disregard the need to test herds for bovine viral diarrhea (BVD). But BVD's long-term cost in lost performance is far greater than testing expenses incurred.

"Economic losses from BVD are caused by decreased overall animal performance, loss of milk production, a decline in reproductive performance and increased risk of disease and death loss," says Dr. Dan Grooms, Michigan State University veterinarian.

The consequences have been known for some time, especially when it comes to detrimental reproductive effects.

- A Danish study in 1993 looked at the influence of BVD virus on dairy herds in which animals persistently infected with BVDV were found. In each herd a risk period was defined as the time before the oldest of the persistently infected animals was six months old. The postrisk period was defined as the period thereafter. In all herds, conception rate was higher in the postrisk period than in the risk period. The increase ranged from 16% to 64% of the conception rate in the risk period. Therefore, it was strongly suggested that the BVDV infection circulating during the risk period had caused a temporary decrease in conception rates.¹
- A study conducted at the University of California in 2004 also found that a high BVDV Type 2 antibody titer at 10 months of age was associated with 32 more days to conceive compared to a low blood titer level.²
- Beyond clinical disease, BVD has been reported to be responsible for 2% to 7% of dairy abortions.³

Numerous sources indicate more than 70% of U.S. dairy cows have been exposed to the BVD virus. These facts indicate that BVD testing and control measures are worth the time and expense.

TIME TO TEST

"As we learn more about BVDV, there's an increasing realization that successful control requires a strategy that involves multiple components and is customized to meet the goals and capabilities of individual producers," notes Grooms.

"The tools available for controlling BVD include diagnostic tests and strategies for detecting both acute and persistent infections, as well as vaccines and biosecurity practices," he adds. By developing a complete plan, the risk of losses associated with BVDV can be reduced significantly.

One caveat: While the focus of information presented here is on diagnostic tests and strategies, remember that experts caution that using one tool without the others results in an inefficient BVD control program.

With that in mind, understand that BVDV diagnostic tests are used for essentially two reasons.

“The first is to identify if BVDV is the cause of or part of a clinical problem that’s been identified,” Grooms explains. “The second—and most important for a control program—is to identify PI cattle since PIs are infected with and shed BVDV their entire life.”

This chart can provide a good starting point in developing a testing strategy.

REASONS FOR INITIATING DIAGNOSTIC TESTS⁴

REASON FOR BVDV TESTING	SUGGESTED DIAGNOSTIC TEST
Diagnosis for acute infection including: <ul style="list-style-type: none"> • Sick animals. • Dead animals. • Abortion. 	<ul style="list-style-type: none"> • Virus isolation from tissues, serum or whole blood, preferably tissues that have high concentrations of lymphoid cells including Peyer’s patches, ileum, spleen, thymus (fetus), lung or liver. • PCR from tissue, serum or whole blood.
Detection of persistently infected (PI) calves younger than four months of age.	<ul style="list-style-type: none"> • PCR on pooled skin samples. • Skin IHC. • Skin ELISA. • SNAP® BVD test.
Detection of PI calves older than four months of age.	<ul style="list-style-type: none"> • PCR on pooled skin samples. • Skin IHC. • Skin ELISA. • Blood (serum) ELISA. • SNAP BVD test.

NOW WHAT?

Choosing the appropriate test and strategy requires a good understanding of the BVDV pathogen and associated disease challenges, so be sure to work with an animal health professional who is mindful of the complexities of the BVDV. Otherwise it will be nearly impossible to correctly interpret test results or develop a meaningful control program.

Meanwhile, a good way to look at different BVDV testing strategies is to start by defining what you are trying to accomplish. Here’s a look at several common situations on U.S. dairies to help figure out how to start fleshing out a plan:

1. Is BVDV causing a clinical problem?
2. Is BVDV circulating on a farm?
3. Find the PIs. This is the most common BVDV testing that occurs today.
4. Reducing the chance of bringing BVDV onto a farm.
5. An animal was positive on a virus detection test—now what?
6. I want to market cattle as BVDV PI free.

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The solution(s) to each one of these scenarios will be different based on individual goals and resources. Click link at left for more information about dealing with these real-life posers, as well as more detail about the various diagnostic tests available.

Because of increased awareness of the significant impact that BVDV can have, efforts to control this virus are increasing, concludes Grooms. Use this information to help improve your control endeavors and decrease the impact of this costly disease complex.

- 1 Houe H, Pedersen KM, Meyling A. The effect of bovine virus diarrhea virus infection on conception rate. *Preventive Veterinary Medicine* 1993;15:117-123. Available at: <http://www.sciencedirect.com/science/article/pii/0167587793901075>. Accessed April 6, 2012.
- 2 Munoz-Zanai CA, Thurmond MC, Heitala SK: Effect of bovine viral diarrhea virus infection on fertility of dairy heifers. *Theriogenology* 2004;61:1085-1099.
- 3 Kirk JH: Infectious Abortions in Dairy Cows, University of California. Available at: <http://www.vetmed.ucdavis.edu/vetext/INF-DA/Abortion.html>. Accessed March 15, 2012.
- 4 Grooms D: Diagnostic tests and strategies to control BVD in dairy operations. *Michigan Dairy Review* 2012;17(1):9-11,20-21. Available at: <https://www.msu.edu/user/mdr/vol17no1/vol17no1.pdf>. Accessed March 12, 2012.