

2008 MONTANA BVD-PI HERD SCREENING PROJECT

Montana State University & Montana Stockgrowers Association

Administered by:

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Introduction

The Montana BVD-PI Herd Screening Project was initiated to improve the overall health of Montana's cattle herd and add value to the state's calf crop. The project continues efforts begun in 2006 by providing technical assistance and limited financial support to Montana ranchers who want to screen their herds for persistent infection (PI) with bovine viral diarrhea (BVD) virus. The focus of this project is to assist ranchers in adopting an array of biosecurity practices that will prevent transmission of the BVD virus from PI animals to cattle breeding herds.

Management and control of BVD in cattle herds must consider two ways the virus passes from one animal to another. The first is *horizontal transmission* – when a transiently (temporarily) infected animal releases the virus in its nasal and other secretions and the virus enters a susceptible animal through the mouth or respiratory tract. The second is *vertical transmission* of BVD virus from an infected dam's bloodstream to her fetus during pregnancy.

Subsequent fetal infection can lead to fetal death, the birth of a normal calf, or the birth of a PI calf – meaning that the infection lasts the entire life of the animal. It's important to note that PI females of breeding age not only are a source of horizontal transfer of BVD virus, but will always produce a PI calf themselves. The primary source of BVD virus is PI cattle; with transiently infected cattle considered a less important source. The cost of the presence of at least one PI animal in a beef herd has been reported to range from \$14.85-\$24.84 per cow/year³.

The economic value of screening for PI animals in cow-calf herds is influenced by the likelihood of finding at least one PI animal in the herd, the negative production effects when PI animals are present, the cost of inputs and the value of animals sold.

Because of the low prevalence of PI animals, not all producers can justify diagnostic screening for PI cattle. However, if ranch history, a significant breach in biosecurity or changes in production practices increases the risk of PI cattle being present in the herd, a protocol to screen the herd can be defended based on the likelihood to improve economic return.

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³ Bob Larson, DVM, PhD, University of Missouri, Columbia, *Planned BVD Control in Beef Herds*, Conference proceedings "BVD Control and Eradication: The future is now!" Jan. 31, 2006, Denver, CO.

2008 Montana BVD-PI Herd Screening Project (cont.)

This project is designed to:

- Gauge the incidence of BVD-PI in Montana.
- Demonstrate overall livestock biosecurity practices.
- Demonstrate innovative disease screening/diagnostic techniques.
- Investigate the economics of BVD-PI elimination on a herd-by-herd basis.
- Develop templates for BVD virus exposure risk at the ranch level.

The project consists of four components:

Education: Understanding how the virus originates and spreads on a cow-calf operation and how it affects production efficiency throughout the beef chain. It's important that scientific research information is shared among education professionals, veterinarians and producers; and that this information is applied under a wide array of field conditions by ranchers and cattle feeders acting alone or under the guidance of an attending veterinarian. Systems have been developed to help producers and veterinarians assess to a degree of *reasonable assurance* the BVD-PI status of individual animals within their herds or under their care.

Diagnosis: Recent innovations in diagnostics allow us to screen cattle herds for the BVD virus at a relatively minimal cost through reverse transcriptase polymerase chain reaction (PCR) technology⁴ using pooled animal tissue samples. Results of the referenced study suggest that performing a reverse transcriptase-PCR assay on pooled fresh tissue samples is a "*sensitive and specific method*" of screening cattle for persistent infection with BVD virus. Diagnosis must be coupled with an animal identification system that allows efficient and accurate identification of BVD-PI animals so they can be removed from the herd.

Also critical to the success of this project is rapid turn-around time of screening results. Once samples are received from participants, the contracting laboratory must deliver "next-business day" screening results and documentation.

Biosecurity: Biosecurity is an integral part of preventing transmission of the BVD virus and overall BVD-PI control. Immunizing cattle herds with appropriate vaccines to protect against transient infection should be the first consideration in a herd biosecurity program. Biosecurity addresses all aspects of livestock movement and handling, mixing and sorting, identification, record keeping and documentation. The general principles of biosecurity and biocontainment as applied to BVD virus include increasing resistance of the host individuals to transient infection.

Producers with the help of their veterinarians must make decisions about the biosecurity tolerance levels they will accept based on the chances of disease transmission and the expected risks and losses from disease.

⁴ *Diagnostic efficacy of a reverse transcriptase-polymerase chain reaction assay to screen cattle for persistent bovine diarrhea virus infection* – James A. Kennedy, DVM, MS, Colorado State University Diagnostic Laboratory, Rocky Ford Branch; JAVMA, Vol. 229, No. 9, November 2006

2008 Montana BVD-PI Herd Screening Project (cont.)

Benefits: Any health management program must reward producers for their time and investment. While in the initial phases of the Montana BVD-PI Herd Elimination Project rewards may or may not come in the form of pricing advantage; later any rewards are more likely to come through increased production efficiency, reduced health management costs and overall improved beef quality. We will continually review the outcomes of this program through systematic economic and production evaluation.

Montana BVD-PI Herd Screening Project Protocol

The systematic screening protocol guides the producer through a series of steps to identify PI animals in the herd and in new arrivals to the herd. The screening process is based on analysis of fluid from “pooled” tissue samples (usually 28 or fewer tissue samples per pool). If the BVD virus is detected in the “pool” the individual tissue samples making up the pool are tested using the Antigen Capture ELISA method. Thus we can determine the individual tissue sample(s) contributing BVD virus to the pool. Therefore, individual animals carrying the BVD virus can be identified by matching the tissue sample using the animal identification number.

Once an animal is identified as a carrier of the virus, the livestock owner/manager is notified. We suggest that the animal (and its dam, if still nursing) be segregated from the herd and held for re-sampling 3-4 weeks later. The second tissue sample should be submitted to the lab for a “re-test” in order to segregate *transiently infected* animals from PI animals. If the second sample is positive for the virus, the producer can *be reasonably assured* that the animal is PI-positive. In the case of an extremely valuable animal, a third sampling may be warranted.

Key Points:

- Screen the herd in advance of breeding to avoid exposure of a pregnant cow by a PI animal.
- Sampling is based on a small ear notch placed in a dry tube kept cool or frozen. Imagine the size of a pie-shaped piece taken from a dime.
- The same tissue sample used for initial PCR screening is the source sample for re-testing to identify individual “reactors” in the pool.
- Cows do not need to be sampled and tested unless they have a positive PI calf. In the case of PI calf, the cow should be identified, sampled and tested.
- Individual identification is critical to match all samples with the animal tested and match the calf with its dam.
- If an animal tests negative for BVD-PI status, there’s no need to ever retest that animal.
- PI surveillance should include the sampling and testing of as many aborted fetuses, stillborns and pre-weaning deaths as possible.

2008 Montana BVD-PI Herd Screening Project (cont.)

- PIs that live to be breeding females can horizontally transfer of the virus to other animals in the herd – and they will always produce a PI calf.
- Ear notches can be frozen for up to 30 days, facilitating sampling over an extended period of time.
- PI animals should be removed from the herd.

Biosecurity Measures:

- All open heifers purchased should be screened for BVD-PI status before purchasing or before commingling with herd and the start of breeding.
- Purchased bred heifers or cows with an unknown BVD-PI status should be kept separate from the resident herd until their PI status can be confirmed. Calves from these animals should be screened prior to commingling.
- All non-biological pairs should be screened for PI status.
- Screen all cows that lose a calf and a tissue sample not obtained from the calf.
- Bulls should be purchased as BVD-PI free. If not, bulls should be screened prior to breeding season.

Perpetual testing for PIs from a practical cow-calf management standpoint is not necessarily recommended. Once a rancher screens his/her herd according to our e herd screening protocol there can be *reasonable assurances* of PI-free cattle with the following management in place:

- A properly applied vaccination protocol.
- A sound biosecurity and biocontainment program.
- Surveillance of suspect animals.

We *highly recommend* that all ranchers work with their attending or consulting veterinarians to develop a herd health protocol that incorporates the above management components including an overall biosecurity program.

Due to limited funding, there will be NO cost sharing available for 2008.
Kits will be provided contingent upon available funding.

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