

# *Bovine Viral Diarrhea Virus Control and Eradication*

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BVDV is estimated to cost an average dairy between \$20 and \$160 per adult cow per year. These losses include medication and labor to treat acute infections, milk production losses in lactating cows, infertility due to decreased conception and early embryonic death, abortions, loss of weak, abnormal, or persistently infected calves. Large scale herd outbreaks such as occurred in the early 1990s are much more devastating and resulted in estimated losses as high as \$1000 per adult cow. The wide variation is due to differences in husbandry practices and vaccine use.

## *Vaccination Benefits and Limitations*

While BVDV vaccinations have been available for many years, we are still no closer to eliminating BVDV than we were 20 years ago because vaccination alone is not sufficient to eliminate BVDV from an infected dairy herd. Current modified live and killed BVDV vaccines are generally effective at preventing the majority of overt clinical disease associated with acute infections, but these vaccines do not fully protect against fetal infection. Recently, some vaccines, more often the modified live BVDV vaccines, have demonstrated the ability to help protect the fetus from infection. This protection ranges between 50% to 80% in controlled studies.

## *Diagnostic Testing and Eradication Strategies*

Comparison of the estimated costs of BVDV (\$20 to \$160 per adult per year) and current testing and eradication strategies (estimated \$5 to \$10 per adult including labor, supplies, and testing) suggest that BVDV eradication programs are economically justified in dairies. The development of a simple, inexpensive test that utilizes a sample that can be easily and conveniently obtained by dairy personnel is the break through that has made eradication programs possible. As always, you should consult with your herd veterinarian in developing and implementing any disease control and eradication program.

Confirming the presence of BVDV in a herd is the first step in developing a BVDV control and eradication program. Suspicion is based on the observation of typical clinical signs including animals with non-specific fevers, decreased fertility, increased abortions (>3% per year), calves with birth defects, and small, stillborn, or weak calves. Periodic serological screening of unvaccinated calves greater than 4 months of age is an effective method of confirming the presence of BVDV. Blood samples from 5 calves in a group of weaned calves should be submitted for both type 1 and type 2 BVDV serology (\$5 per sample). Titers greater than 1:512 are consistent with recent infection in the calves and suggest the presence of a persistently infected calf in the commingled group. Similar testing can be performed on adult cattle however it is more difficult to interpret due to vaccine-induced titers.

The gold standard diagnostic test is virus isolation from blood samples. Unfortunately this test requires the ability to collect blood samples and is relatively expensive (\$20 per sample). It is best used to confirm acute infection. Other tests have been developed to identify persistently infected cattle including the microtiter ELISA, antigen capture ELISA, skin immunohistochemistry (ear notch test) and PCR assays. Each test has its advantages and disadvantages. Refer to the insert for further explanation.

If the presence of BVDV is confirmed, a BVDV eradication program should be investigated based on economic considerations. Eradication of BVDV is economically advantageous if the cost of testing, eradication, continued surveillance and control is less than the cost of the disease. The focus of eradication strategies is to identify and eliminate persistently infected animals and thus remove the source of BVDV in a herd.

Two general strategies may be employed to identify persistently infected cattle and eliminate BVDV from a

herd. The first strategy employs the testing of all cattle on the premises at one time. Alternatively, only calves at birth are tested and the cost of the program is spread over the entire calving interval.

Once a herd is free of BVDV, precautions must be established so that the herd is not reinfected. A comprehensive vaccination program should be maintained, as reintroduction of BVDV into an immunologically naive herd could be devastating. The purchase of a persistently infected animal or a negative animal already carrying a persistently infected fetus due to exposure at the herd of origin is the most likely way to reinfest a herd. Springing heifers from heifer rearing facilities are particularly at risk of carrying a persistently infected fetus. All new introductions into a herd, including their offspring and any bulls, must be tested as described above. Since the standard tests used to pick up persistently infected animals do not always detect acute infections, incoming animals must be quarantined for 3 weeks prior to introduction into the common herd.