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BVD - diagnosis and control

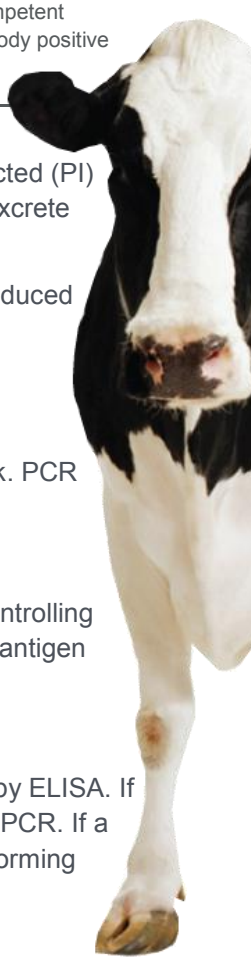
Gribbles VETERINARY

Bovine viral diarrhoea (BVD) is one of the most significant viral diseases in cattle. It can result in poor reproductive performance, reduced milk yield, ill thrift and immunosuppression. Clinically, there are three forms of the disease:

- A persistently infected form (PI) which may/may not have clinical signs.
- An acute transient form (TI) characterised by fever, diarrhoea and short-term immunosuppression. These animals will mount an immune response and clear the virus in 10-14 days.
- Mucosal disease (MD), which only occurs in PI animals. PI animals are infected by a non-cytopathogenic strain of the virus. A subsequent spontaneous mutation of the virus to a cytopathogenic strain within the PI animal results in mucosal disease. MD is characterised by sero-mucoid nasal secretions, severe erosive lesions in the oral and intestinal mucosa, diarrhoea and death.

A key element for persistence of infection in cattle herds is the ability of the virus to cross the placenta in naive animals and infect the foetus. Infection of pregnant cows has different outcomes depending upon the gestation period:

Gestation Period			
< 40 days	**40-120 days**	**120-150 days**	**> 150 days**
Foetal death.	Foetal abortion or birth of persistently infected calves that are immunologically tolerant to the virus (i.e. virus positive but antibody negative).	Foetal abortion or birth of calves with congenital defects, especially of the CNS (e.g. cerebellar hypoplasia). Antibody positive without detectable virus.	Birth of normal calf that may be small and weak, but has a competent immune response (antibody positive and virus negative).



Epidemiology:

Infection is believed to be widespread in New Zealand with up to 60% of herds infected. Persistently infected (PI) animals are considered the most important source of infection in a herd, as these animals continuously excrete large amounts of virus throughout their lives from nasal discharge, saliva, semen, urine, tears, and milk.

Disease often occurs when a susceptible animal is introduced into an infected herd or a PI animal is introduced into susceptible herd.

Laboratory diagnosis:

Gribbles Veterinary is able to detect BVD in blood and tissues using either an antigen capture ELISA or polymerase chain reaction (PCR). An antibody ELISA is used to detect BVD antibodies in serum and milk. PCR is a more sensitive methodology and can be done on serum, milk or ear notch* samples.

Disease control:

Defining the BVD status of animals in a herd and identifying any PI animals are the first stages toward controlling or eradicating the disease. This can now be done economically and rapidly using a combination of PCR, antigen and antibody ELISA tests.

To investigate a herd's BVD status:

- In lactating animals a bulk milk sample can be collected from the vat and tested for BVD antibody by ELISA. If the antibody result is high, a PI could be present and a milk sample should then be tested by BVD PCR. If a milk sample is positive on PCR, stratify the herd by production and serum sample the poorest performing

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If you have any questions or would like any further information, please contact your local Gribbles Veterinary laboratory or Territory Manager.

10% of the herd first. Test for virus by PCR, eliminate any PI animals, then recheck another milk sample by PCR.

- In non-lactating animals ideally take serum samples from 15 animals (minimum 9) in each age group of cattle you wish to investigate and test for antibody by ELISA to establish if BVD is in the herd (15 serum samples gives a 95% chance of finding a seropositive animal). The 15 sera are pooled in the laboratory for testing.
- Take serum or ear notch* samples from all cattle. Gribbles Veterinary will pool the submitted samples to be tested by PCR for virus. If a positive pool is found the individual samples making up the pool will be tested individually, this will identify both PI and transiently infected animals.
- If all serum or ear notch* samples from a herd test negative by BVD PCR, the herd can be considered clear of infected animals and biosecurity/vaccination programs put in place.
- For surveillance, annual testing is recommended. The herd may be tested with a bulk milk antibody test on the lactating animals and the rest bled and tested by antibody ELISA (individual serum samples from 15 yearling/ heifers). Virus screening of all keeper-calves is now also recommended.
- Biosecurity can be maintained by pre-testing new introductions to the herd for virus, with possible vaccination for on-going protection. Quarantine a newly bought pregnant cow until she calves because her calf could be PI. Then test the calf once born for virus.

Suitable Samples

- 10mL of serum in a plain (red top) tube
- Fresh refrigerated milk in sterile 50mL bottle
- Semen, spleen, fetal stomach contents, ear notch samples*, fetal heart blood and fetal fluids

** The 'AllFlex TSU' is our preferred tissue sampling system, as it produces an appropriate sized tissue sample and maintains the integrity of the sample in transit to the laboratory.*

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