



AHL LabNote Number 1

Updated, May 2018

Summary of bovine viral diarrhea virus (BVDV) testing at the AHL

Updated by Davor Ojkic, DVM, PhD

TEST	SAMPLE TYPE	PURPOSE
PCR test for virus detection	EDTA blood, serum, plasma, tissues, ear notches, milk	Primary test for both persistently and acutely infected animals – sensitive, rapid, cost-effective.

Herd screening: Test pools of 5-20 samples. Submit individual samples so, if needed, lab can “open” pools to determine which animals were positive.

To differentiate between persistent infection (PI) and acute infection: A positive PCR result on a single sample cannot distinguish between an acutely infected animal and a PI animal. Re-test positive animals at least 3 weeks after first testing. PI animals will be virus-positive a second time. Acutely infected animals that have recovered will be virus negative.

Bulk tank milk testing: Most PI animals die before 2 years of age, but some may survive longer. Bulk tank milk samples can be used to identify PI animals that become part of a milking group. Submit 200 mL of milk from a well-stirred bulk tank. The sample should represent a pool of not more than 400 animals. Keep milk chilled - DO NOT FREEZE.

- If the test is negative, then individual animals need not be tested.
- If the test is positive, milk should be retested in 3 weeks to rule out acute infection.
- If the bulk milk sample is positive a second time, evaluate animals individually.

To decrease the cost (number of individually tested animals), initially test first-lactation animals, removing any positives, followed by testing another bulk milk sample. If this is negative, remaining 2nd and 3rd lactation animals that contributed to the bulk milk sample do not need to be tested. Alternative strategy is to milk half the herd, take a milk sample, milk the remaining half of the herd and take a second sample. If only the second sample is positive, then individually only test the animals that contributed to the second milk sample.

TEST	SAMPLE TYPE	PURPOSE
1) Virus neutralization (VN) test for antibody detection	Serum	Cattle infected with a BVDV-1 virus will have comparatively higher titers in a VN assay with BVDV-1 (NADL). Similarly, cattle infected with a BVDV-2 virus will have higher titers in BVDV-2 (NVSL) VN assay. For alpacas, BVDV-1b TGAC will be used.

Herd screening: Single sera can be used to determine if the herd has previously been exposed to BVDV.

Seroconversion: Test paired sera, collected 2-4 weeks apart. In naive animals, it may take as long as 4 weeks to develop a significant antibody titer to BVDV. Since paired sera must be tested on the same day for direct comparisons to be made, please submit the acute and convalescent sera together.

Recent exposure: All calves should have lost maternal antibody by 6 to 8 months of age - if animals between the ages of 8 and 12 months have not been vaccinated but have antibody, then they have been exposed to a field virus within the last few months. If they have been vaccinated with killed virus vaccine, then their BVDV antibody titer would commonly be less than 256. This strategy is not useful if young animals have been vaccinated with a modified live virus vaccine.

In utero infection: Testing sera collected from calves at birth prior to ingestion of colostrum can be useful to demonstrate in utero infection and can also be used to indicate “recent” herd exposure in large commercial dairy herds.

Other tests available to detect virus:

TEST	SAMPLE TYPE	PURPOSE
2) Immunohistochemistry	Formalin-fixed tissue	When fresh tissues are not available, or as a part of postmortem procedures for individual diagnostics. Not available for herd PI screening.
3) BVD Antigen Elisa		Discontinued due to false positives – replaced with PCR – see above

For more information please email: ahl.virology@uoguelph.ca