

## Bovine Viral Diarrhoea Virus (BVDV) PI Testing Fact Sheet

### *Background information*

Bovine Viral Diarrhoea Virus is one of the most economically significant diseases in both beef and dairy cattle. The virus can infect a foetus *in utero* by crossing the placental barrier and establish itself in the calf when its immune system is still immature. The calf will harbour BVDV for the rest of its life and is, by definition, persistently infected (PI).

It's not uncommon for a PI calf to be born and to grow up uneventfully, however, it will shed BVDV virus through every bodily fluid, thereby not only contaminating the environment but also potentially infecting every cow it is commingled with.

As PI animals are considered the single most important and effective transmission mode of BVDV, this creates a significant risk for many animals to become transiently infected (TI) with BVDV. While those animals generally recover, they do present significant economic losses to the producer, causing spontaneous abortion, reduced weight gain, yield losses and if infection occurs in susceptible dams early in their pregnancy, the generation of more PI animals.

Neogen Australasia can accept several different sample types for testing, as PI animals harbour the virus in their tissues, the most appropriate sample types for PI detection are tissue samples, including hair follicles and TSUs. To ensure an accurate result, we request fresh samples are sent, so they would be no more than a four old from sampling date when we process them. Testing of older samples may lead to false negatives, due to break down of the viral particles in the tissue over time. **Testing of samples over 4 weeks old may invalidate results.**

BVDV testing is conducted using different methods to accommodate the different sample types and provide optimal test results.

- **ELISA**; is used for *TSU* samples, it is a BVDV-antigen ELISA, that detects virus proteins in the tissue.
- **RT-PCR**; is used to test *hair, blood or blood cards*, it is a nucleic acid-based assay that detects the presence of the viral nucleic acid.

Both tests carry excellent sensitivity and specificity and will not detect vaccinated animals (see FAQ number 5 for more information). The turnaround times are similar.

### *Frequently Asked Questions*

1. **What is the best sample to collect?**

The preferred sample types are hair or TSU. Serum and semen should not be used for BVDV testing.

2. **Can I use bull semen as a sample?**

No. Semen is not a suitable sample type for testing as BVD virus is shed intermittently in semen, so may not provide an accurate result.

**3. Why do I need to do confirmatory testing when an animal has been found positive for BVDV in one of your tests?**

Generally, the diagnosis of BVDV PI has severe consequences since biosecurity considerations require the affected animal to be removed from the herd, usually by slaughter. The lab recommends doing (complimentary) confirmatory testing because not all animals testing positive initially turn out to be PI. Once the VDX lab obtains a positive BVDV result, the animal is called "BVDV suspect" and confirmatory samples (If hair initially, send blood (recommended) or TSU, If TSU, send blood (recommended) or hair) are requested. If confirmatory testing returns a negative result, this animal, then, is not a PI but a TI and simply needs some time to clear the virus. Not all confirmatory cases, however, are that clear. In cases when initial test result and confirmatory test result combined do not make good sense, we will continue testing until a satisfactory final diagnosis can be achieved. It is important to keep in mind that any presence of BVDV (TI or PI) on a farm is a potentially significant problem that should be addressed.

**4. When is the best time to test?**

In a BVDV biosecurity program, all calves born on the premise should be tested right after birth so that any PI animals can be readily identified and removed before they have a chance to come in. Generally, the earlier in an animal's life it's tested the sooner potential PI animals can be removed.

**5. Will the test be positive if I vaccinated my animals?**

Generally no; however, if vaccination occurred recently some virus particles may be found in the blood, triggering a positive test result. In these cases, confirmatory testing becomes very important to determine the true BVDV status of the animal.

**6. Can a persistently infected (PI) animal recover?**

No, by definition, a persistently infected animal can never clear the virus from its body. Since it was infected at a time when the immune system was immature and unable to react appropriately, a PI animal cannot mount an immune response and the virus cannot be fought off.

**7. Last year I did not have a BVDV problem at all. This year I had several PI animals among my calves. How is that possible?**

It is likely when the mother cows just became pregnant with the calves that are now born, BVDV entered the farm; either from another animal that was bought without having been tested for BVDV, or from a person that had been in contact with a positive animal, i.e. an auction house. When the virus came onto the farm, it infected the cows, but the infection remained mild and unrecognised. However, the virus crossed the placenta and infected the foetus, in more than one mother cow, and PI calves were generated.

**8. I have a closed herd and have not bought any animals for some time. How is it possible that I have PI animals on the farm now?**

The virus was carried in by people or vehicles. BVD virus can last in the environment for some time and remain infectious.

**9. Can I test newborn calves?**

Yes, calves can be tested, but it is important that nursing calves be tested using tissue (TSU, fresh ear notch or hair), as maternal antibodies can cause a false negative if blood or sera is tested. Even after being weaned for a month or so, a false negative may still be detected, we recommend animals under 9 months be tested using tissues samples.

**10. If I have a BVDV PI calf, do I need to test the dam for BVDV?**

It's possible that PI cows lead outwardly productive lives and don't appear sick. Even though their fertility is usually reduced, these cows can become pregnant, and will always give birth to a PI calf. It is highly recommended to test the dam to make sure she's not a PI even though most PI calves are generated by transient infection of the mother that will get cleared after a while.

**Neogen Australasia only offers BVDV-PI testing as an add-on service to our genomic testing, not a stand-alone test.**