

Precautionary calf age limit for BVD Antigen ELISA on ear punch samples

Based on new trial data which shows that maternal antibodies can interfere with the detection of antigen in skin tissue by Antigen ELISA, the BVD Steering Committee recommends that calves must be over 35 days old for BVD AgELISA screening by blood or ear punch skin samples

Background

- The presence of maternal antibodies may interfere with BVD virus or antigen detection in PI calves. Specifically the virus isolation and some AgELISAs are affected, particularly when applied to blood or serum samples.
- Until now, it has been widely accepted internationally that colostral antibodies have no significant impact on the test results ear tissue sample testing by the IDEXX BVD AgELISA. Consequently this test is used here and overseas to screen neonatal calves from birth using ear punch samples.
- All New Zealand veterinary laboratories now use this kit for BVD screening because of its excellent performance.

However, a recent LIC study that monitored persistently infected calves intensively during the first month of life, has demonstrated that:

1. In some PIs antigen may remain undetectable by BVD AgELISA for extended periods after colostrum intake.
2. The impact observed amongst trial PI calves was similar in both serum and skin tissue with poor AgELISA performance in the first two weeks of life.
3. Most PI calves were test positive well before two weeks of age, but occasionally a calf may remain AgELISA negative longer.

4. All PI calf samples (serum and skin punches) collected after day 35 were positive on AgELISA.
5. PCR testing of the same serum samples from these calves resulted in 100% test sensitivity for PI detection.
6. The trial confirmed that transient infection is common in young calves. The PCR will detect many more virus positive animals than in older cattle, resulting in a high proportion of pooled samples that require individual retesting.
7. Because of the poor performance of the AgELISA assay in young calves, individual samples from PCR positive pools cannot simply be retested by AgELISA. Instead additional PCR tests have to be undertaken to confirm the status of the individuals in the positive pool.

Recommendations

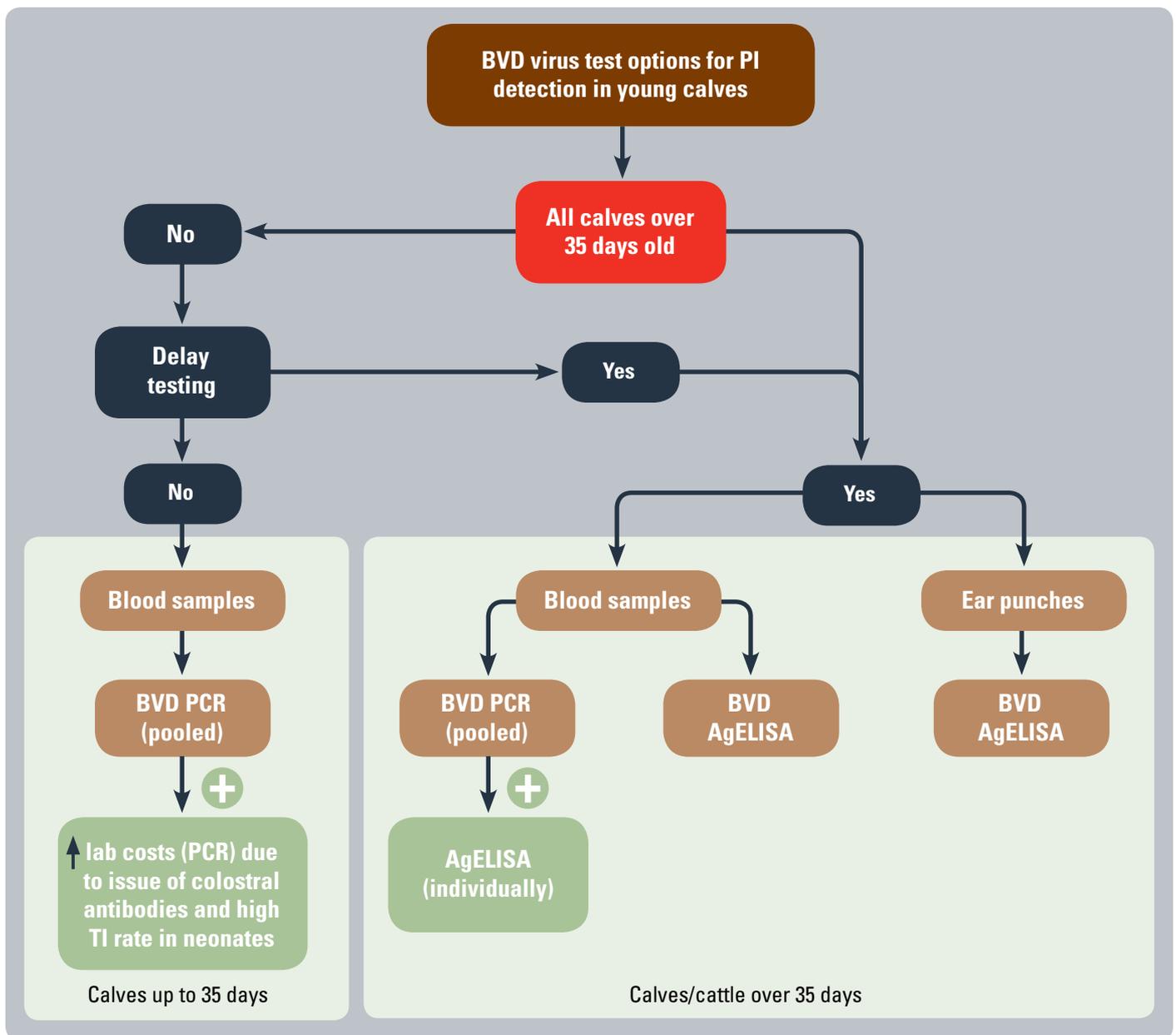
1. Calves must be over 35 days old for BVD Antigen ELISA screening. This applies to both blood samples as well as ear punch skin samples.
2. Irrespective of the test chosen, it is imperative that the minimum age of the calves is clearly stated on the submission form to enable the laboratory to make informed decisions and interpretations.

See the flow chart on the back of this sheet.



BVD STEERING COMMITTEE

Working to free New Zealand cattle farms from BVD



Test sensitivity Test sensitivity of modern BVD virus detection tests (both PCR and AgELISA) is close to 100% with excellent PI detection, however no test is failsafe and failures may occur occasionally for a variety of reasons including misidentification.

Test specificity True false positive test results are extremely rare, i.e. a positive test result means virus was found in the sample. However sampling transiently infected animals may impact PI detection specificity especially in calves and after mingling.

For successful BVD control, PI screening and testing must be accompanied by ongoing monitoring and biosecurity measures with good veterinary advice.

Notes

- The recommended age limit is based on limited trial data and is a precautionary move. We are investigating options to explore this diagnostic age gap further so that we understand it better and may possibly adapt the recommendations in the future.
- The cost of testing young calves by PCR is significantly higher than for other age groups. The laboratories will need to look at the cost structure and may increase charges for calf BVD PCR.
- Veterinarians should remain aware that tests based on ELISA and PCR technologies both have limitations and that no test will detect every PI animal every time. Test performance may vary in different groups of animals or farming conditions. It is important that testing occur within the framework of a control program with ongoing on farm monitoring (eg of bulk milk samples) to limit the impact of false negative results.
- Misidentification, poor sample handling and other errors are the most likely cause of incorrect results. Over 1% of punch skin sample vials submitted for parentage and BVD testing by farmers and vets are empty, so check if skin sample is present before submitting. Precise and complete recording as well as good sample storage throughout the testing process are critical to successful outcomes.