

Timing of BVD Vaccination for Calves

John H. Kirk, DVM, MPVM

Extension Veterinarian
Veterinary Medicine Extension
School of Veterinary Medicine
University of California Davis
Tulare, CA 93274

A key management strategy for the prevention of calf hood diseases has been to give sufficient colostrum to each calf soon after birth to provide antibodies to fight infections. When most of the calves have adequate levels of circulating antibodies in their blood, the risk of a severe outbreak of disease in the calves is minimized. Depending on the amount of colostrum, quality of the passive antibodies and timing of giving the colostrum to the calves, the antibodies in the blood will reach a peak level shortly after birth and then begin to decay away over the next few months. Any circulating antibodies remaining in the blood are thought to counteract the beneficial effects of vaccination. The key then to reducing the risk of infection in the calves is to give the vaccination at a time when the colostral antibodies have declined to a point where they will not have a significant negative effect on the vaccine but yet still provide some protection themselves to the calves. A recent paper by faculty at the University of California Davis¹ addressed this question of when to give BVD vaccines to calves to provide the best protection.

In their study, the amount of colostrum-derived antibodies was measured in 466 calves from 2 California dairies. The average peak titer for calves in these two herds was about 1:512 for BVDV type 1 and 1:256 for BVDV type 2 at 1-3 days of age. Half of the calves were considered to have no colostrum-derived protection for BVDV type 1 by 141 days of age and for BVDV type 2 by 114 days of age. The titers for BVDV type 1 averaged 1:32 and 1:16 for BVDV type 2 at 3 months of age. The rate of decay was associated with the peak blood titers at 1-3 days of age and whether or not the calves were infected from birth with BVD.

Calves on one dairy were vaccinated at 16 and 47 days with a killed BVDV vaccine and at 60 and 240 days with a MLV BVDV vaccine. On the other dairy, calves were vaccinated at 15 days with a killed BVDV vaccine and at 45 and 180 days with a MLV BVDV vaccine. Some calves were held as controls and not vaccinated.

Results of the study indicate that protective antibodies are present for a long time in vaccinated calves compared to non-vaccinates. The length of time the antibodies were present was greater for calves with higher peak colostrum-derived titers. As an example, calves with peak BVDV type 1 titers of 1:32 that were vaccinated took on average 182 days before titers became undetectable compared to 78 days for non-vaccinates. In contrast, calves with peak titers of 1:2,048 that were vaccinated had an average of 178 days while the non-vaccinates took 182 days. There were differences between BVDV types 1 and 2.

To estimate the appropriate time to vaccinate calves in your dairy, it will be necessary to determine the level of peak titers at 1-3 days of age. It will also be necessary to determine if calves are being born with infections. Your veterinarian can help you make these determinations for your herd. Once this information is known for your herd, comparisons can be made with the results of this study to get a better idea of the best time to vaccinate your calves for BVDV in order to maintain a balance between colostrum-derived and vaccine induce protection.

¹Munoz-Zanzi CA, Thurmond MC, Johnson WO, and Hietala SK. Predicted ages of dairy calves when colostrum-derived bovine viral diarrhea virus antibodies would no longer offer protection against disease or interfere with vaccination. JAVMA 221(5): 678-685, 2002.