

Vaccination Programs for Breeding Heifers using Combinations of Killed and Modified-Live BVDV Vaccines

E.J. Dubovi, PhD; Y.T. Grohn, DVM, PhD; D.V. Nydam, DVM, PhD

Department of Population Medicine and Diagnostic Science, College of Veterinary Medicine, Cornell University Ithaca, NY 14853

Introduction

Despite preventing morbidity and mortality in properly immunized cattle, sometimes bovine viral diarrhoea virus (BVDV) vaccines have failed to prevent reproductive consequences of BVDV infection, in particular, persistently infected animals.

High (SN) titers may provide fetal protection in at-risk breeding heifers. Our objective was to test different types and sequences of administration of killed and modified-live virus (MLV) vaccines to determine which produced the greatest titer response.

Materials and Methods

Female Holstein dairy calves four months of age and assigned sequentially to one of six treatment groups. Vaccinations were done at four, five and 10 months of age. Treatment groups were as follows: 1) K, K, K; 2) K, K, M1; 3) K, K, M2; 4) K, K, M3; 5) M1, M1, K; 6) M1, M1, M1, where: K= killed BVDV type 1a and 2; M1= MLV BVDV adjuvanted type 1a; M2 = MLV BVDV type 1a and 2; M3 = MLV BVDV type 1a. All vaccines were commercially available 9-way products.

Serum samples were taken at four, five, six, 10, 11 months of age. SN titers were done using microplate format for BVDV type 1a, and 2. Alpha was set at 0.05.

Results

A total of 248 calves completed the trial. The 10-month (pre-third vaccination) compared to the 11-month (post-third vaccination) arithmetic mean titers for BVDV type 1a for each of the treatment groups were: 1) KKK= 59, 340; 2) KKM1= 79, 9449; 3) KKM2= 82, 9513; 4) KKM3= 230, 2459; 5) M1M1K= 938, 1366; and 6) M1M1M1= 1084, 952.

For BVDV type 2, the titers were as follows: 1) KKK= 71, 363; 2) KKM1= 80, 4854; 3) KKM2= 102, 4835; 4) KKM3= 91, 1303; 5) M1M1K= 90, 567; 6) M1M1M1= 99, 111.

Significance

MLV vaccination of calves previously sensitized with killed vaccine produced significantly greater SN titers. Killed vaccine boost of MLV-sensitized calves produced no significant increase in BVDV SN titers.