

Evaluation of a Commercial Vaccine to Protect Developing Fetuses from Natural Challenges with Bovine Viral Diarrhea Virus and Bovine Herpesvirus 1

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Introduction

Fetal protection in heifers vaccinated with a modified-live vaccine (Express[®] FP5, Boehringer Ingelheim Vetmedica) was evaluated following sequential, prolonged field exposures to animals persistently infected (PI) with bovine viral diarrhea virus (BVDV) and animals acutely infected with bovine herpesvirus 1 (BoHV-1).

Materials and Methods

Vaccinated cross-bred beef heifers (n=20) received two doses of vaccine 30 days apart; unvaccinated heifers (n=10) received saline. Heifers were inseminated 34 to 57 days after the second vaccination. Pregnant heifers were commingled in a 4.8-acre pasture for 56 days with three steers PI with diverse sub-types of BVDV. Heifers were between 45 and 68 days of gestation on the first day of BVDV challenge. Eighty days following removal of PI animals, three BoHV-1-infected bulls were commingled with pregnant heifers for 14 days.

Results

One vaccinated heifer was found to have aborted following BVDV challenge. This fetus was not found and a definitive diagnosis of etiology was not possible. Four heifers in the unvaccinated group aborted fetuses PI with BVDV following BoHV-1 challenge. All calves (10/10) from the unvaccinated group were PI with BVDV; none (0/19) from the vaccinated group were PI. Bovine herpesvirus 1 was not detected in calves or fetuses in either treatment group. Live calves from the vaccinated group had significantly higher birth weights (65.4 lb; 29.66 kg) than live calves from the unvaccinated group (38 lb [17.2 kg]; $P < 0.0001$).

Significance

Thus, vaccination with two doses of Express[®] FP5 consistently prevented BVDV infection of developing fetuses despite stringent, natural challenge. Furthermore, field exposure to BoHV-1 was associated with abortions only in unvaccinated heifers.