EFFICACY AFFORDED BY THE INFECTIOUS BOVINE RHINOTRACHEITIS VIRUS FRACTION OF AN INTRANASAL MODIFIED LIVE VIRUS VACCINE INFORCE™ 3 (IBR-PI3-BRSV) IN AN EXPERIMENTAL CHALLENGE MODEL IN NEONATAL CALVES

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The objective of this study was to demonstrate the efficacy of an intranasally administered modified live virus vaccine INFORCE™ 3 containing infectious bovine rhinotracheitis virus (bovine herpesvirus 1), parainfluenza 3 and bovine respiratory syncytial virus (IBR-PI3-BRSV) against a virulent IBR challenge (Cooper strain).

Methodology: Thirty-five, seronegative three- to eight-day-old Holstein calves were randomly assigned to a control group (n=17) and a vaccinate group (n=18) and vaccinated intranasally on day 0 with a single 2 mL dose of a placebo vaccine (containing PI3-BRSV) or INFORCE™ 3 (IBR-PI3-BRSV) vaccine, respectively. During the vaccination phase, the two groups were housed in separate rooms, but all animals were commingled for the fourteen-day-long challenge phase. Calves were challenged intranasally with IBR 28 days following vaccination. Efficacy was measured by comparing the development of acute IBR disease or morbidity, rectal temperatures and nasal shedding of IBR virus between groups. Post-challenge clinical observations were performed by a clinician masked to treatment group assignments. Supporting variables were post-challenge rectal temperatures and duration of IBR virus shedding in nasal secretions. All animal procedures were approved by ethical review for compliance with ANIMAL WELFARE guidelines. All laboratory testing during the study was performed without knowledge of assigned treatments or animal numbers.

Results: The IBR-PI3-BRSV vaccine INFORCE™ 3 elicited a serological virus neutralizing antibody response to IBR which was boosted by challenge. The IBR challenge induced more acute IBR disease in controls (17 of 17 or 100%) than the vaccinates (1 of 18 or 5.6%), demonstrating a significant vaccine effect (P< 0.0001). The control group developed significantly higher (P< 0.05) least squares mean rectal temperatures than vaccinates on days 3 through 9 following challenge. Comparison of least squares mean duration of IBR shedding also demonstrated a vaccine effect as vaccinated calves shed virus for a significantly shorter duration (7.3 days) than control animals (12.3 days; P< 0.0001).

In conclusion, the IBR fraction of INFORCE™ 3 vaccine helped protect 3- to 8-day-old calves against virulent IBR challenge four weeks following vaccination by decreasing clinical signs of disease as compared to controls.