

EVALUATION OF A KILLED *NEOSPORA CANINUM* VACCINE IN BEEF CATTLE

W.W. Jones¹ and J.P. Kastelic²

¹Sangudo Veterinary Clinic, Sangudo, AB, T0E 2A0, Canada

²Agriculture and Agri-Food Canada, Lethbridge AB, T1J 4B1, Canada

The objective was to determine the efficacy of a killed *Neospora* vaccine (*Neospora Caninum Vaccine Killed Protozoa*, Bayer) to improve calving rates and reduce vertical transmission in a herd of purebred Shorthorn cattle (n=171; 37 heifers and 134 cows). Before the trial, the incidence of failure to calve averaged 17.2% (over 3 y), and 32 and 66% of calving and noncalving cows, respectively, were seropositive for *Neospora*. Cattle were ranked by body weight (heifers) or postpartum interval (cows) and allocated to receive a SQ injection (5 mL) of vaccine or placebo (n=83 and 89, respectively). Vaccinations were done (in accordance with animal availability) on 2 occasions before bull exposure (on Days –18 and –6 in heifers and on Days –27 and –12 in cows), with a third vaccination approximately 200 d later. Cattle were allocated (equal numbers of vaccinates and controls) into 5 breeding pastures (each with 1-3 bulls, all deemed satisfactory breeders) for 82 d (cows) or 102 d (heifers). Blood samples were collected concurrent with the first and third vaccinations (approximately 225 d apart), and serum *Neospora* titers determined (IDEXX ELISA). Cattle with an S/P ratio ≥ 0.50 on 1 or both blood samples were designated seropositive. Pregnancy diagnosis was done 40 d (ultrasound) and 80 d (rectal palpation) after bull removal. In 26 calves with seropositive dams, *Neospora* titers were measured in blood samples collected prior to uptake of colostrum (failure of passive transfer).

Serum *Neospora* titers were 0.52 ± 0.09 and 0.52 ± 0.10 (mean $\pm$ SE) in vaccinated versus control cattle at the first sampling and were 0.65 ± 0.09 and 0.52 ± 0.09 at the second sampling (first vs. second sample in vaccinates only, $P < 0.05$). The proportions of nonpregnant cattle in the vaccinated and control groups were 8.4 and 6.8% at ultrasound and were 9.6 and 7.9% at rectal palpation. Overall, 13 cattle were nonpregnant at ultrasound, 2 abortions occurred between then and rectal palpation (1 vaccinate and 1 control), and a third (control) cow aborted 1 mo after rectal palpation (all 3 abortions occurred in seropositive cattle). There were 53 seropositive and 118 seronegative cattle; 8 from each category failed to calve (Relative Risk, 2.23). Of the 8 seropositive cattle that failed to calve, 5 were vaccinates and 3 were controls; only 2 of these (1 vaccinate and 1 control) were seropositive only on the second blood sample. Of the 26 calves sampled prior to uptake of colostrum, 15 and 11 had vaccinated and control dams, respectively, and 86.7 and 72.7% of these calves were seropositive. Serum *Neospora* titers in the seropositive calves were lower in those with vaccinated versus control dams (3.45 ± 0.09 vs. 3.94 ± 0.22 , $P < 0.05$). In conclusion, the vaccination protocol that was used did not significantly improve calving rates or prevent vertical transmission of *Neospora*.

Keywords: *Neospora caninum*, vaccine, abortion, cattle