Characterization of serum, uterine and vaginal IgG response against *Trichomonas foetus* surface antigen after administration of a commercial killed whole *T. foetus* vaccine in beef cows

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Bovine trichomoniasis is a sexually transmitted disease caused by *Trichomonas foetus*, which affects cattle reproductive performance and profitability of beef farms. Infections with *T. foetus* result in vaginitis, cervicitis, and endometritis which are associated with embryonic death and abortion. Since *T. foetus* is an extracellular microorganism, immunoglobulins in vaginal and uterine mucosa are believed to be essential to protection. The objective of this study was to determine the level and duration of IgG antibodies induced against a *T. fetus* purified surface antigen (TF1.17) in serum, vaginal and uterine secretions after systemic immunization of beef cows with a commercial vaccine containing killed whole *T. foetus*. We hypothesize that administration of a commercial vaccine containing *T. foetus* provides a significant induction of specific IgG to a *T. foetus* surface antigen in serum, vaginal secretions and uterine flush samples of beef cows, and that the levels of IgG remain elevated over baseline for several weeks. Twenty beef cows (> 30 days postpartum) were randomly assigned to vaccine or control groups as follows: vaccine (n=10): cows received 2 mL of a commercial vaccine containing killed whole *T. foetus* (TrichGuard®, Boehringer Ingelheim Vetmedica, Inc., St. Joseph, MO) subcutaneously and a 2-mL booster 2 weeks later. Control (n=10): cows received 2 mL of sterile saline on the same schedule. Vaginal secretions and blood samples were collected on days 0, 8, 15, 22, 29, 36, 43, 50, 60, 75, 89, 110, 146, and 182 relative to day of vaccination. Uterine flush fluid was collected on days 0, 15, 29, and 43 after the day of primary vaccination. Serum, vaginal secretions and uterine flush samples were assayed for IgG antibodies to the immunoaffinity purified-lipophosphoglycan (LPG)/protein antigen TF1.17 of *T. foetus* using ELISA as described previously. IgG antibody levels were compared between groups for each day using a two independent sample t-test, and over time using a repeated measure analysis of Statistical Analysis System (SAS®). Serum *T. foetus*-specific IgG levels were significantly increased (between days 8 and 182) following vaccination with *T. foetus* compared to the values on day 0 (*P* < 0.001) and the control group during the same days (*P* < 0.001). Serum IgG levels remained elevated for at least 26 weeks (day 182). A significant rise in TF1.17-specific IgG levels was observed in vaginal and uterine fluids from day 15 after vaccination compared to the baseline levels (*P* < 0.001). These levels remained elevated in vaginal and uterine secretions through days 75 and 43 after primary vaccination, respectively. Antibody levels in serum, vaginal and uterine secretions remained low in the control group throughout the study. In conclusion, vaccination of beef cows with a commercial vaccine containing *T. foetus* induced significant increase in the levels of IgG to the *T. foetus* surface antigen in serum, vaginal secretions and uterine fluid, which remained elevated through days 43, 75 and 182 in uterine fluids, vaginal secretions and serum, respectively. The induced TF1.17-specific IgG response is likely to be important in the prevention of trichomoniasis in beef cattle.

**Keywords:** *Trichomonas foetus*, TF 1.17 specific IgG, vaccine, beef cows