

Efficacy of a Monovalent *Leptospira borgpetersenii* Serovar Hardjo Strain hardjobovis Vaccine Protocol on Measures of Fertility in Holstein Dairy Cattle

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Introduction

Leptospira borgpetersenii serovar Hardjo strain hardjobovis may hamper reproductive efficiency of dairy cattle, and controlling infection would be of economic value. To assess the efficacy of a commercial monovalent strain of *L. borgpetersenii* serovar Hardjo hardjobovis vaccine the vaccine was administered in conjunction with systemic oxytetracycline. Cows and heifers (n=1,894) from a dairy herd naturally infected with strain hardjobovis were enrolled in a prospective, randomized, clinical trial.

Materials and Methods

Animals were enrolled in either the vaccine protocol group (n=986) or the control group (n=908). At dryoff, vaccinated cows received two doses of the vaccine, 28 to 35 days apart, with the initial dose administered in conjunction with oxytetracycline. Control cows received two doses of lactated Ringer's injection at the same time intervals. Heifers received the same treatments, with the second dose at least two weeks prior to entrance into the heifer breeding pen. Routine herd practices were maintained during the trial period.

Results

Initial herd prevalence assessment found 13% of animals actively infected with strain hardjobovis. Survival analysis on days to conception showed the vaccine protocol exerted no effect on the probability of conceiving

between the vaccinated and control groups ($P \geq 0.56$). Logistic regression showed the cumulative proportion of heifers pregnant, regardless of vaccination, was approximately 2.8 times higher than primiparous and pluriparous cows. The vaccine protocol did not impact pregnancy loss ($P \geq 0.93$), though only a limited number of pregnancy losses (n=143, 7.5%) were detected. Post-treatment herd prevalence reassessment found 15% of animals actively infected with strain hardjobovis, and there was no statistical difference between herd prevalence at initiation and termination of the trial (chi-square test, $P \geq 0.94$).

Significance

It has been suggested that vaccination and antimicrobial therapy of cattle infected with *Leptospira borgpetersenii* serovar Hardjo strain hardjobovis will increase conception rate and decrease infertility associated with strain hardjobovis. Vaccination with this monovalent strain of hardjobovis vaccine is also suggested to prevent reproductive and renal tract colonization and urinary shedding for up to 12 months. The treatment and prevention vaccination protocol failed to improve days to conception, conception rates, and subsequent reproductive efficiency in this California dairy herd. We conclude that this protocol is not effective in improving reproductive efficiency in commercial Holstein dairy cows or in reducing shedding of leptospires, and vaccination cannot be recommended.