Evaluation of the Field Performance of the First Commercial *Neospora* Vaccine in Dairy Cattle

Les Choromanski[1]; John Zimmerman[2]; Sandy Rodgers[3]
[1]*Intervet Inc. Shawnee, Kansas*
[2]*Waconia Veterinary Clinic, Waconia, Minnesota*
[3]*IDEXX Laboratories, Westbrook, Maine*

Introduction

Neospora caninum, the causative agent of neosporosis, was recognized in 1991 as a major cause of abortion in dairy cattle in California. The first isolation of *Neospora caninum* from bovine aborted fetuses and experimental reproduction of neosporosis in cattle was reported in 1993. Today, neosporosis is described more commonly in dairy cattle, but also has been identified in beef breeds. Infections with *Neospora*, which can be acquired by cattle via congenital or horizontal transmission, have been associated with a 3-fold increase of abortion for herds with endemic abortions. For herds with epidemic abortion, the increased abortion risk can be as high as 40-fold, indicating a significant economic impact of neosporosis in affected herds. A research project was initiated to evaluate feasible control measures aimed at reduction or elimination of abortions caused by *Neospora caninum*.

Materials and Methods

On December 29, 1998 the U.S. Department of Agriculture (USDA) issued the first commercial license—with conditional approval—of the *Neospora caninum* vaccine for use in cattle. Thus, since 1998 this killed protozoa vaccine has been available in the United States for use in healthy pregnant cattle as an aid in the reduction of abortion caused by *Neospora caninum*. First shipment of the commercial *Neospora* vaccine was forwarded to the Waconia Veterinary Clinic in Minnesota in 1999, and was designated for evaluation of the field performance of this first and only vaccine available for neosporosis. The Minnesota dairy herd used in this study had a history of numerous abortions by immunochistochemistry and diagnostic testing confirmed *Neospora* in aborted fetuses. Serological testing by enzyme-linked immunosorbent assay (ELISA) revealed that 51 of the 107 cows tested positive for *Neospora caninum* antibody.

Cows were vaccinated with either one, two, or three doses of the *Neospora* vaccine, depending on abortion history and pregnancy status of each animal during 1999. A dose of the *Neospora* vaccine consisted of a single 5 ml subcutaneous injection.

Results and Conclusions

The results of this trial demonstrate the effectiveness of the *Neospora* vaccine in reducing abortion caused by *Neospora caninum*. After years of multiple abortions in the herd (*i.e.*, 27 recorded abortions in 1997 as well as 27 abortions in 1998), only four abortions were recorded in 1999 after introduction and continuation of *Neospora* vaccination throughout the year. Additionally, seven heifers that were born to *Neospora*-vaccinated cows and were retained for replacement tested negative for *Neospora* antibody in ELISA assay at six months of age. Moreover, the fact that six of those seven heifers were born to *Neospora*-positive and vaccinated dams provided first indication that the *Neospora* vaccine is effective in interrupting vertical transmission of this parasite from seropositive dams to their offspring. To our knowledge, this is the first report demonstrating that commercial *Neospora* vaccine appeared to induce protection against vertical transmission of *Neospora canium* in cattle.