

Risk Factors for *Neospora caninum* Infection and Associated Abortion in Ontario Holstein Dairy Herds

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Introduction

Neospora caninum has been identified as a major cause of abortion in dairy cattle worldwide. The objective of this component of an epidemiological study investigating *N. caninum* in Ontario was to identify risk factors for *N. caninum* serostatus and related abortions in Ontario Holstein dairy herds.

Materials and Methods

A total of 88 herds, consisting of 5080 cattle, utilizing Ontario Dairy Herd Improvement services were selected and divided into three groups. Case (n=30) and first control (n=27) herds were selected from 1998-99 fetal abortion submissions to the Animal Health Laboratory, University of Guelph, Ontario, that were histopathologically positive or negative, respectively, for *N. caninum*. A second control group (n=31) was selected from multiple sources of previously sampled herds that had a low prevalence (<7%) of antibody to *N. caninum*; historical serology for identification of these herds was not more than four years old. Between May and December 1999 all available cows on all farms, in parity one or greater, were blood sampled. The sera were analyzed for antibody to *N. caninum* at the California Veterinary Diagnostic Laboratory System in Davis, using a kinetic enzyme-linked immunosorbent assay (ELISA).

A comprehensive survey administered at the time of sampling recorded information on housing, species inventory, manure management, reproduction, biosecurity practices, wildlife observations, peri-parturient cow management, herd disease history and nutrition. Production and other herd parameters were obtained from Ontario Dairy Herd Improvement records.

Results and Conclusions

Initial data analyses indicated that presence and number of dogs ($p < 0.01$) and duration a dog had been on a farm ($p < 0.05$) were risk factors for higher herd *N. caninum* seroprevalence. Inadequate herd vaccination status was also a risk factor ($p < 0.01$). Further analysis indicated that *N. caninum* herd seroprevalence (OR=1.1, $p < 0.01$), total number of dogs on the farm (OR=1.7, $p < 0.05$), and exposure of cattle to a stream or pond (OR=4.0, $p < 0.05$) were all potential risk factors for a herd experiencing *N. caninum* abortion. Factors affecting the risk of being a seropositive herd were presence of dogs (OR=2.2, $p < 0.05$) and number of cats on a farm (OR=0.8, $p < 0.01$). When analyzing for risk of a herd exhibiting serological evidence of horizontal infection, total abortion rate (OR=1.5, $p < 0.01$) and insecure placental disposal (OR=9.9, $p < 0.01$) were identified, while presence of dogs was insignificant ($p = 0.36$).