Epidemiology of Neospora Infection in Ontario Holstein Dairy Cows

T. Duffield,[1a] A. Peregrine,[1b] B. McEwen,[1c] S. Hietala[2]
[1]Department of Population Medicine,[a]
Department of Pathobiology,[b]
Animal Health Laboratory,[c]
University of Guelph, Guelph, Ontario, Canada
[2]California Veterinary Diagnostic Laboratory, University of California, Davis

Frozen serum samples obtained from a large field study conducted in 1995 involving Holstein dairy cattle from 25 farms in the Guelph, Ontario, Canada region were analyzed for anti-*Neospora* antibodies. Paired sera from 3 weeks prior to calving and 9 weeks postcalving were available from 758 cows and first-parity heifers. The overall prevalence of *Neospora caninum* seropositivity was 7% from the 758 samples obtained at the first sampling 3 weeks prior to calving. Between the first and second samples, 17 animals seroconverted. Herd prevalence ranged from 0 to 38%. There were 11 farms that had a prevalence of less than 5%, 7 farms had a prevalence between 6% and 15% and the remaining herds had a seroprevalence above 15%. No seropositive cows were identified in 7 of the 25 herds, but not all the cows in these herds were sampled. Thus, they should be considered low-prevalence herds rather than free of *N. caninum* infection.

The impact of *Neospora* infection on milk production was tested using repeated measures analysis of variance. Serum titer was not significantly associated ($P>0.05$) with either an increase or decrease in milk production during the first 90 days of lactation, measured through regular monthly Dairy Herd Improvement milk tests. This contrasts with data from California which reports a significant effect of *Neospora* infection on milk production.

Simple 2 x 2 tables and the Chi Square statistic were used to screen for potential impacts of *Neospora* infection on culling and health. Variables significantly associated with *Neospora* infection at $P<0.20$ were further assessed using logistic regression. Seropositive cows were not at increased risk of culling during the first 3 months of lactation compared to seronegative animals. Within the herds identified to be seropositive, the risk of retained placenta was increased over 2 times compared to seronegative animals ($P<0.01$). There was a tendency for seropositive cows to have a higher incidence of displaced abomasum, however, this was entirely confounded by the impact of *Neospora* infection on retained placenta. *Neospora* infection was not significantly associated with any other periparturient disease.

This data provides some insight into the epidemiology of *Neospora* seropositivity in Ontario dairy herds. In addition, it appears that cows infected with *Neospora caninum* based on serology have an increased risk for retained placenta at calving.