

# An Analysis of the Economic Impact of *Neospora caninum* in Ontario Dairy Cattle

**J. Hobson, BSc DVM<sup>1a</sup>; T. Duffield, DVM DVSc<sup>1a</sup>; D. Kelton, DVM MSc PhD<sup>1a</sup>; A. Peregrine, BVMS PhD DVM<sup>1a</sup>; S. Hietala, PhD<sup>2</sup>; K. Lissemore, DVM DVSc<sup>1a</sup>; B. McEwen, DVM DVSc PhD DACVP<sup>1c</sup>; K. Leslie, DVM MSc<sup>1a</sup>; G. Cramer<sup>1a</sup>**

<sup>1a</sup>Department of Population Medicine

<sup>1b</sup>Department of Pathobiology

<sup>1c</sup>Animal Health Laboratory, University of Guelph, Guelph, Ontario

<sup>2</sup>California Animal Health & Food Safety Laboratory System, University of California-Davis, Davis, CA

## Introduction

The difficult task of establishing the economic impact of *Neospora caninum* infection in dairy cattle is complicated by the broad parameters defining the effects of *N. caninum* infection. Estimates of the impact of the abortifacient effects have ranged from annual losses of \$6.78 million (USD)<sup>a</sup> in New Zealand to \$35 million for California. \$7.3 million is lost annually in Japan by decreased milk production in infected animals. A negative effect on milk production has not proven universal, yet assumptions regarding it are integral to an accurate economic estimate. This work describes the results of an analysis of the association between *N. caninum* infection and milk production in two Ontario dairy herd populations. In one group of cows from herds experiencing *N. caninum*-abortion problems (group A), seropositive animals produced 607 lb (276 kg) less 305-day milk than seronegative cows (n=1196, p<0.05). By contrast, in the second population of herds (group B), considered representative of Ontario, seropositive animals produced 332 lb (151 kg) more 305-day milk compared to seronegative cows (n=3162, p=0.10). The objective of this work was to quantify the economic effect of *N. caninum* infection in Ontario dairy cattle, considering the potential detrimental or enhancing effect of infection on milk production.

## Materials and Methods

A spreadsheet was constructed employing the following assumptions: an Ontario dairy cattle population of 386,000; overall abortion rate of 5%; 13% of

abortions attributable to *N. caninum*; and average cost per abortion of \$595. Estimates of the proportion of herds having multiple abortions and the number of herds experiencing abortion problems due to *N. caninum* were based on data from the Animal Health Laboratory, University of Guelph. The within-herd seroprevalence of the herds from Groups A and B were based on data from a case-control study in Ontario (22.1 and 9.1%, respectively). Overall provincial economic gain or loss due to *N. caninum* was then calculated. For the Canadian component pricing system, a 3.8% butterfat, 3.4% protein, 5.78% other solids and July 2001 prices were assumed.

## Results and Conclusions

These data estimate 2,235 *N. caninum* abortions per year in Ontario for an annual loss of \$1.3 million. In herds with *N. caninum*-associated abortion problems, reduced milk production in *N. caninum* infected cattle produced losses of \$105 per 305-day lactation. However, there was a \$57 benefit in milk production in *N. caninum*-seropositive cattle in herds considered representative of Ontario. Provincial loss attributed to reduced milk production in seropositive animals in herds with *N. caninum* abortion problems was estimated to be \$136,628, and potential financial gain in milk production in seropositive animals in herds without abortion problems was \$1.9 million. Collectively, there was a net provincial gain of \$416,381 for the Ontario dairy industry. While crude, this analysis raises concerns regarding recommendations of culling *N. caninum*-seropositive animals in herds with low to normal rates of abortion.

<sup>a</sup>All monetary figures are expressed as United States dollars.