

Seroprevalence of Johnes Disease, *Neospora caninum* and Bovine Leukosis Virus in Canadian Cow-Calf Herds

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Introduction

The objective of the Canadian Beef Production Limiting Diseases project was to conduct provincial serological surveys across Canada for production limiting diseases in cow-calf herds. The diseases were chosen because they are three diseases known to occur in Canada and all have subclinical carrier states. Each of these diseases has significant economic implications in terms of trade or reduced productivity, and none are easily controlled using conventional treatment methods. The diseases chosen to estimate prevalence for were bovine leukosis virus (BLV), *Mycobacterium paratuberculosis* (Johnes's Disease) and *Neospora caninum* (Neosporosis). Provincial surveys had already taken place in dairy cattle, and two provinces (Manitoba and Quebec) had already performed surveys of beef cattle.

Materials and Methods

Two mailings were sent during the winter and spring of 2003 to a total of 3000 randomly selected cow-calf herds from the Canadian Cattle Identification Agency list of cow-calf herds in Canada. Producers that agreed to cooperate on the study were sent a 19 page questionnaire to be filled out by the herd manager. The questionnaire included questions on the farm profile, breeding management, calves and calving management, feeding management, veterinary procedures and vaccinations and biosecurity practices. During the fall of 2003, blood samples were collected from 30 randomly selected cows from each herd at fall round-up time. These samples were centrifuged and serum was frozen. Aliquots of serum were separated for serology for *Mycobacterium paratuberculosis*, bovine leukosis virus and *Neospora caninum*. Herds were considered positive for *Mycobacterium paratuberculosis* if at least two cows were seropositive. Herds were considered positive for *Neospora caninum* if at least two cows were seropositive. Herds were considered positive for bovine leukosis virus if at least one cow tested seropositive.

Results

In total, 179 producers cooperated with the study and blood samples were collected from 4778 cows and 1518 calves during the fall of 2003 and winter of 2004. The response rate of cooperating producers to the initial mail-out was 6%. In total there were 44 herds sampled in British Columbia, 29 in Alberta, 32 in Saskatchewan, 40 in Ontario and 33 herds sampled in Atlantic Canada. Two hundred and ninety-four cows tested seropositive for *Neospora caninum* (6.2%), and 42.5% (76/179) of herds had at least two cows test seropositive. Thirty-seven cows tested seropositive for *Mycobacterium paratuberculosis* (0.8%) and 4.47% of herds had at least two cows test seropositive. Fifty-six cows tested seropositive for bovine leukosis virus (1.2%), and 11.2% of herds had at least one cow test seropositive. Eastern Canadian cow-calf herds had significantly higher seroprevalence rates of bovine leukosis virus and *Mycobacterium paratuberculosis* than western Canadian cow-calf herds.

Significance

The response rate to the randomly selected mailing was very poor at 6%. Factors such as a significant drought in Western Canada and the industry impact of discovering a cow with Bovine Spongiform Encephalopathy played a significant role in the low response rate. This low response rate may have an impact on how well these herds represent the population of cow-calf herds in Canada. *Neospora caninum* appears to be a relatively common infection in cow-calf herds across Canada. The seroprevalence rate to this parasite was not significantly different across geographic regions, and 42.5% of herds showed evidence of infected animals present. *Mycobacterium paratuberculosis* and bovine leukosis virus have very low levels of seroprevalence across Canada. The seroprevalence of these two diseases was significantly higher in eastern Canadian cow-calf herds, and this may be due to the higher level of exposure to dairy cattle in these geographic regions.