SPECIAL REPORT

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Trends in bovine abortions submitted to the Ontario Ministry of Agriculture, Food and Rural Affairs, 1993–1995

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Based on data from April 1994 to March 1995 at the Veterinary Laboratory Services Branch, Ontario Ministry of Agriculture, Food and Rural Affairs (VLSB, OMAFRA), the rate of cattle herds with abortion was 0.24, or about 1 out of every 4 herds. This estimate was obtained by dividing the number (504) of herds with diagnoses of abortion (based on pathology) by the number (2105) of herds submitting material for pathologic diagnosis to VLSB laboratories in Brighton, Guelph, Kemptville, and Ridgetown. The data likely represent the proportion of herds with serious abortion problems. Other research has estimated the number of herds in Ontario with any aborted calves at about twice the VLSB rate (1).

There was an increase in the frequency of cattle herds with abortions from April 1993 to October 1995, and it peaked during the January–April 1995 period. This elevated rate is explained by a steady increase in the percentage of dairy herds with abortions, with an estimated peak of 40% of herds being affected in April 1995. This trend among dairy herds over the 30-month period was markedly different than the seasonal pattern seen in beef herds with abortions (Figure 1).

The increased rate of dairy herds with diagnoses of abortion among all dairy herds in Ontario submitting material for pathological diagnosis to VLSB in October 1994–June 1995 (Figure 2) follows the high levels of herd diagnoses of acute bovine virus diarrhea (BVD) since June 1993. Further investigation is required to determine the nature of the apparent temporal association between the elevated levels of BVD and abortion in the cattle herd population.

The frequency of abortions declined in October 1995. However, prospective information would be useful for veterinarians to manage the risk of abortion in their clients' herds. Forecasts using exponential smoothing of previous data (Statistix 4.1, 1994, Analytical Software, Tallahassee, Florida) suggest that one should not be too optimistic about the decline in October (Figure 2). The number of dairy herds with abortions may persist at the higher level of 30 per 100 at risk into 1996, based on VLSB pathology data, indicating the need for continued, regular surveillance.

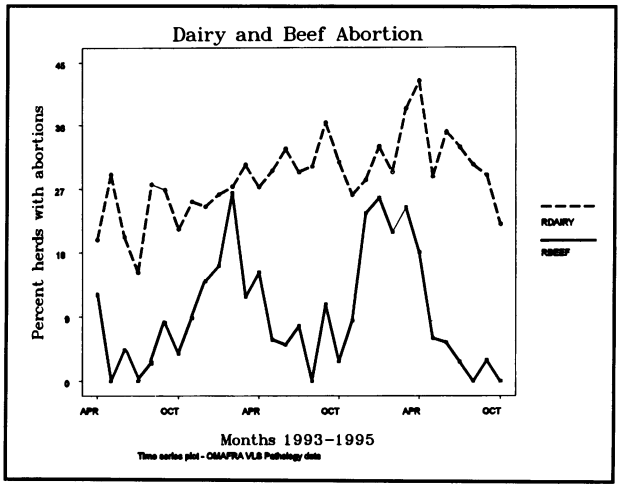

Figure 1. Percentages of beef and dairy cattle herds in Ontario in which abortion was diagnosed between April 1993 and October 1995. Estimates based on pathology data from the Ontario Ministry of Agriculture, Food and Rural Affairs.

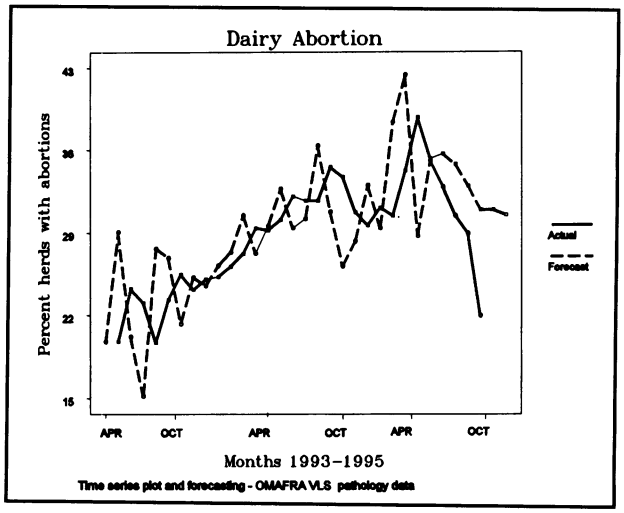

Figure 2. Percentage of dairy herds in Ontario in which abortion was diagnosed from April 1993 to October 1995. Estimates based on pathology data from the Ontario Ministry of Agriculture, Food and Rural Affairs.

Diagnoses of abortion attributed to bacterial, *Neospora* sp., and mycotic agents increased from 1993–1994 to

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Table 1. Etiologic diagnoses of bovine abortion cases submitted for examination to the Veterinary Laboratory Services Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, 1993–1995[1]

Etiologic diagnosis	Number of diagnoses (%) 1993–94	1994–95
A. Bacterial abortion	68 (13.8)	86[2] (16.3)
B. *Neospora* spp.	8 (1.6)	30 (5.7)
C. Mycotic abortion	16 (3.2)	20 (3.8)
D. Bovine virus diarrhea	24 (4.9)	18 (3.4)
E. *Ureaplasma diversum*	15 (3.0)	9 (1.7)
F. Bovine herpesvirus type 1	7 (1.4)	6 (1.1)
G. Fetal monsters	7 (1.4)	6 (1.1)
Total etiologic diagnoses	145	175
% etiologic diagnoses	29.5%	33.2
Total etiology undetermined	347	352
% etiology undetermined	70.5%	66.8
Total abortions submitted for pathology	492	527

[1]Based on pathology and/or histopathology

[2]Includes: culture negative but consistent lesions (49); *Actinomyces pyogenes* (9); *Bacillus licheniformis* (6); *Listeria monocytogenes* (4); *Staphylococcus* spp. (4); *Salmonella* spp. (3); *Escherichia coli* (3); *Leptospira* spp. (2); *Chlamydia* spp. (2); *Coxiella* sp. (2); *Campylobacter* spp. (1); *Pasteurella* spp. (1)

1994–1995 (Table 1), for submissions that included gross pathology or histopathology examinations. Interpreting trends between years must be done cautiously due to the unknown level of bias affecting submission rates to the laboratory.

The greatest change was about a three-fold increase in abortions due to *Neospora* sp., which may reflect a combination of improved diagnosis, greater awareness, and increased incidence. An analysis of diagnostic data from Tulare, California, indicated only a slight upward trend in the numbers of abortions due to *Neospora* sp. over a 6-year period to 1990, with a marked seasonal pattern of higher levels in winter and spring (2).

Of the 32 herds diagnosed with *Neospora* sp., 5 previously (since 1994) had BVD. Although this was more than would have been expected by chance, the biologic nature of this association needs further study and surveillance. It has been suggested that abortions due to *Neospora* sp. may follow immunosuppressive infections (3). According to the United States Department of Agriculture, laboratories in the northeastern states are also making more diagnoses of abortions due to *Neospora* sp. (4). A more detailed report of *Neospora* abortions in cattle in Ontario has already been published (5).

Most bacterial isolates from the 86 cases of bacterial abortion diagnosed in 1994–1995 were usually considered to be sporadic causes of abortion. Exceptions were *Leptospira* spp. and, occasionally, *Campylobacter* spp., or *Listeria monocytogenes* (6). Diagnoses of *Leptospira* spp. were likely underestimated in these data, due to the unavailability of accurate diagnostic tests (6) and inconsistent submissions for serology. The proportional rate of bacterial abortion at VLSB is similar to the 14.49% reported in South Dakota (7).

An etiologic diagnosis of bovine abortion was obtained in 33.2% of abortions in 1994–1995, compared with 29.5% in 1993–1994. A definitive diagnosis was not made in two-thirds of bovine abortions, a level comparable with that in other laboratories (7). This may have been due to a combination of noninfectious abortions, limitations of current diagnostic technical capabilities, and sampling techniques.

Based on these data, we recommend increased surveillance in herds at risk for abortion; increased herd biosecurity, including strategic vaccination and control of the fecal contamination of cattle feed from any wildlife, rodent, or domestic species; and submission of the appropriate number and types of specimens to a diagnostic laboratory for examination should abortions occur.

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