A CASE OF BOVINE CYSTICERCOSIS IN A FEEDLOT

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An outbreak of bovine cysticercosis in an Ontario feedlot involved an estimated 473 of 3800 cattle which were slaughtered from November, 1985, to October, 1987, when the premise was depopulated. This report reviews the epidemiologic investigation conducted by Agriculture Canada.

INVESTIGATION AND FINDINGS

The feedlot had no known prior history of cysticercosis. The cattle originated from diverse sources. The owner and employees all reported that the feedlot had no contact with sewage or human excreta. Vegetable waste, the major feed source, was obtained from local processors and stored at the feedlot in concrete pits. Human sewage sludge disposal on approved farmland began in the local area in 1984. Suspect vegetable feed samples, fecal specimens from employees and sludge from the local sewage treatment plant were examined for Taeniid eggs, with negative results. The composting vegetable waste at the feedlot was hot to the touch. The epidemic curve is shown in figure 1. Prevalence rates and number of cysts per carcass were each compared according to several variables. All infestations were light, regardless of duration of stay at the feedlot. Table 1 shows the prevalence rates by season of entry into the feedlot, and statistical analysis. Monthly environmental data were used, together with information regarding Taenia saginata viability (Lawson and Gemmell, 1983), to construct bioclimatograms for 1985, 1986 and 1987. The bioclimatogram for 1986 is shown in figure 2.

DISCUSSION

The increased incidence in 1987 may be due to the more intensive post mortem screening procedures. The observed seasonal pattern may implicate vegetable waste, which was delivered to the feedlot from mid-summer through autumn. Onset of human sludge disposal on approved local farmland preceded first identification of cysticercosis by one year. Sludge illegally applied to cropland could have contaminated the vegetables. The high water content of sludge may provide a suitable microenvironment for survival and development of Taenia saginata eggs. The sedimentation and centrifugation of sludge may actually concentrate eggs in sewage. The system of permits to control sludge

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application and the dilution effect on sludge from distribution on fields through to the cleansing and sanitary procedures at the vegetable processors reduce the chances of eggs reaching the feedlot. Prolonged exposure to the hot vegetable compost at the feedlot would probably destroy any remaining eggs.

Figure 2 illustrates that conditions for viability of Taenia saginata eggs were most favourable from November to February and least hospitable from April to June. This coincides with the observed seasonal variation, with greater incidence among cattle entering the feedlot in the fall and early winter than among those entering from late winter to early summer. These observations are most consistent with repeated on-farm contamination directly from a human source. The absence of relationship between time spent at the feedlot and number of cysts found per infested carcass suggests that repeated exposure did not cause heavier infestation. Development of active immunity may explain this (Lawson and Gemmell, 1983). Highly efficient mechanisms could widely distribute eggs throughout the premises, causing the observed light level of infestation affecting a high proportion of cattle (Pawlowski, Z.S., 1982).

As a result of this investigation, direct on-farm contamination by human excreta or tapeworm segments is considered the most likely source of infestation. However, contamination of the vegetable feed source before arrival at the feedlot could not be ruled out.

REFERENCES

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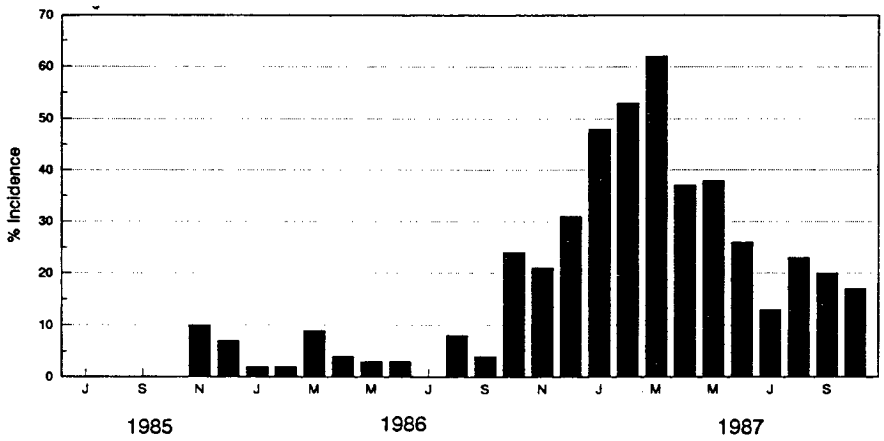

Figure 1: Monthly Incidence of C. bovis: Nov/85 - Nov/87

Season of Entry	C. bovis +	C. bovis -	Totals
Fall - Winter '86	178	183	361
Winter - Summer '87	51	229	280
Totals	229	412	641

x^2= 65.0 (1 d.f.) @ p<.005 Odds Ratio=4.4 Attributable Rate: 31%

Table 1: Prevalence of C. bovis Infestation - Statistical Analysis

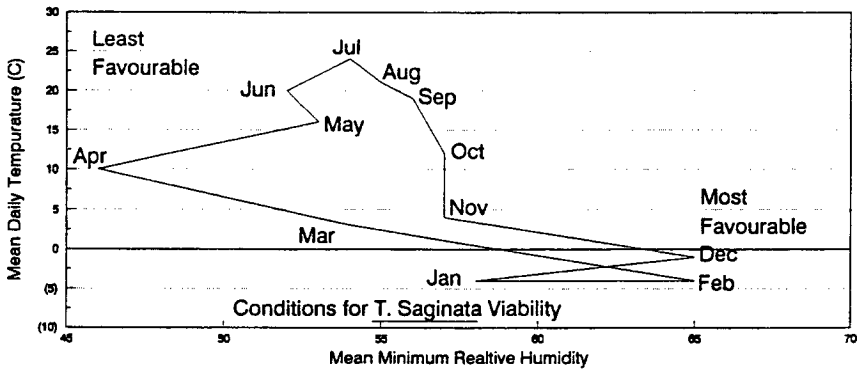

Figure 2: Bioclimatogram - for survival of T. saginata eggs 1986

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