Table 1. Antimicrobial activity against 233 isolates of *Mycoplasma bovis*.

	Range*	Mode**	Median & MIC50***	MIC90****
Chlortetracycline	0.25 to >32	4	4	16
Enrofloxacin	0.03 to 4	0.215	0.25	0.5
Erythromycin	4 to >32	32	32	>32
Florfenicol	0.06 to 8	1	1	4
Oxytetracycline	0.125 to >32	2	2	16
Spectinomycin	1 to >16	2	2	4
Tilmicosin	0.5 to >128	64	64	>128
Ampicillin	>32	>32	>32	>32
Ceftiofur	64 to >64	>64	>64	>64

* Range of results for 223 isolates
** Mode – the most frequent result
*** Median and MIC50- the central result – 50% of the isolates with MIC below and 50% above the value
****MIC 90 – 90% of the isolates with MIC below the value. All values are expressed as µg/ml.

Neospora caninum Seroprevalence in Iowa Feedlots and its Association with Morbidity, Mortality, Production Parameters and Carcass Traits

P. L. Schmidt, *DVM, MS[1];* **A. M. O'Connor,** *BVSc, MVSc, DVSc, MACVSc[2]*
[1]*College of Veterinary Medicine, Western University of Health Sciences, Pomona, CA 91766*
[2]*Department of Veterinary Diagnostic and Production Animal Medicine, College of Veterinary Medicine, Iowa State University, Ames, IA 50011*

Introduction

Since first recognized in 1984 and described as a cause of bovine abortion in 1989, *N. caninum* has emerged as a leading cause of abortion in cattle worldwide. Traditionally, the economic impact of Neospora infection on beef productivity has been thought to be limited to the costs of abortion and increased culling. However, recent studies of Texas-based feedlot cattle described an association between the presence of *N. caninum* antibodies and reduced average daily gain, live body weight and hot carcass weight at slaughter. Seropositive feedlot steers, while exhibiting similar morbidity and mortality rates as seronegative steers, also demonstrated higher treatment costs if sick compared to seronegative sick calves. The purpose of this study was to test the null hypothesis that *N. caninum* seropositive Iowa feedlot cattle had similar morbidity rates, mortality rates, treatment costs, production parameters and carcass traits compared to seronegative cohorts. We also examined the hypothesis that the occurrence of chronic disease was equal between *Neospora caninum* serologically positive and negative animals.

Materials and Methods

This prospective cohort observational study was conducted in two western Iowa commercial feedlots in fall 2002. Six hundred sixty-seven animals from 31 consigners were enrolled over five separate days. The cattle were spring and summer-born calves from Iowa. All had been previously vaccinated for respiratory and *Clostridial sp.* pathogens. Blood samples were collected at processing.

Serum was tested for presence of antibodies to *N. caninum* and bovine viral diarrhea virus (BVDV) using a commercially available ELISA kit. Morbidity and mortality was recorded by the feedlot staff and performance data were recorded by the commercial feedlots. Carcass data were provided to consigners by abattoir facilities for 405 study animals.

A T-test was used to demonstrate the univariate association between Neospora status and continuous variables. A Chi-square test for proportion was used to compare the association between Neospora status and categorical variables. To test the null hypothesis that *N. caninum* seropositive Iowa feedlot cattle had similar morbidity and mortality rates (categorical outcome variables)compared to seronegative cohorts, a generalized linear model with a logit link was specified in PROC MIXED using the GLIMMIX macro in SAS. To test the null hypothesis that *N. caninum* seropositive Iowa feedlot cattle had similar treatment costs, production parameters and carcass traits (continuous outcome variables), a generalized linear model was specified in PROC MIXED in SAS. To test the hypothesis that the occurrence of chronic disease was equal between *Neospora caninum* serologically positive and negative animals we ran five models. The definition of chronic disease became more restrictive with each model; 2 or more treatments = chronic, 3 or more treatments = chronic,...6 or more treatments = chronic.

Backward elimination was then used to eliminate variables from the initial model if Wald statistic p-values were <0.05. Potential confounding variables, consignor group, gender and BVD PI status, were included in all models.

Results

The prevalence of *N. caninum* seropositive cattle was 5.85% (39/667). Of the consigner groups, 35% (11/31) had at least one seropositive animal. Within consigner groups, prevalence of *N. caninum* seropositive cattle ranged from 0 to 18.75%. Two animals were identified as persistently infected with BVDV, neither of which were seropositive for *N. caninum* antibodies.

Morbidity and mortality for *N. caninum* seropositive animals were 30.77 and 0% respectively. Morbidity and mortality for *N. caninum* seronegative animals were 30.08 and 2.56% respectively. No significant associations between *N. caninum* serostatus and morbidity or mortality variables were found. Similarly, no association between *N. caninum* serostatus and individual treatment costs was found in this study. None of 28 production and carcass variables, including average daily gain, adjusted final weight, hot carcass weight and ribeye-to-hot carcass weight ratio, were determined to be associated with *N. caninum* serostatus of feedlot animals.

Significance

Our study failed to find any association between *N. caninum* serostatus in Iowa feedlot cattle and morbidity or mortality variables. This finding agrees with previous studies and suggests that *N. caninum* infection is not associated with the occurance of disease or death in commercial feedlots. We were unable to repeat findings by others which indicated a positive association between treatment costs and *N. caninum* seropositive status. We were also unable to identify significant associations between chronic disease, measured from two or more treatments up to six or more treatments and *N. caninum* serostatus. Again, this suggests that *N. caninum* infection does not apparently contribute to the costs associated with treatment of diseased animals in commercial feedlots. We did not find an association between decreased production performance (average daily gain, feed efficiency, adjusted final weight) and carcass measures (hot carcass weight, ribeye-to-hot carcass weight ratio) and *N. caninum* serostatus in Iowa feedlot calves.

In our study population, *N. caninum* serostatus does not appear to be a significant factor in feedlot production costs. Given this, we would not recommend utilization of on-arrival testing or vaccination of feedlot animals to try to eliminate or control *N. caninum* in the feedlot.