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SERO-EPIDEMIOLOGICAL SURVEY OF *D. VIVIPARUS* IN MISSOURI CATTLE

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Cattle sera were randomly collected over a 1-year period from the Missouri State-Federal Cooperative Animal Health Laboratory and tested with an ELISA developed to detect antibodies to Dictyocaulus viviparus. Of 8039 animals tested, 2818 (35.0 ± 2.1%) were positive for D. viviparus-specific antibodies. Dairy cattle (42.5 ± 2.8%) had a significantly higher prevalence than did beef cattle ((32.9 ± 1.4%). Fall (44.2 ± 2.5%) had a significantly higher in prevalence than both spring (31.0 ± 2.1%) and summer (25.3 ± 2.8%), but not winter (37.9 ± 3.0%). Winter had a significantly higher prevalence than summer, but not spring or fall. Of 369 herds, 81 ± 5% had 3 or more animals sero-positive to antibodies against D. viviparus. D. viviparus exposure appears to be widespread in Missouri. Geographical location of a herd within the state appears to have no effect on prevalence

INTRODUCTION

Parasitic mortality due to infection with the ruminant lungworm, *Dictyocaulus viviparus (D.v.)* is common among cattle in areas where the infection is endemic (Eddi et al., Jarrett et al., Jorgensen and Ogbourne). These endemic areas are found worldwide in moist temperate regions including Great Britain, The Netherlands, New Zealand, Ireland, Germany, Austria and Cuba. However, little is known about the epidemiology of *D.v.* in the U.S. Prior to 1982, many researchers obtained epidemiology data regarding *D.v.* through the use of fecal analysis (Baermann filtration) or necropsy data. Beginning in 1982, enzyme-linked immunosorbant assays (ELISA's) were being developed and assessed to determine their usefulness in sero-epidemiological surveys of *D.v.*.

MATERIALS AND METHODS

Between Feb 1993 and Jan 1994, samples were obtained by collecting serum from clotted blood samples submitted by veterinarians to the MO Dept of Agriculture Animal Health Lab., Jefferson City, MO. A subset (20-29) was taken from each herd submission with > 20 samples. A highly sensitive and specific ELISA for antibodies against *D.v.* was used (Bates et al). Confidence intervals (95%) constructed using an adjustment for intracluster correlation (Donald and Donner) were compared.

RESULTS

Of 8039 animals tested, 2818 were positive for *D.v.*-specific antibodies (35.1 ± 1.3%). There were no significant differences among three age classes (≤2, 2<x≤4, >4) for exposure to *D.v.*. There was no significant difference between females (35.3 ± 1.3%, n=7832 and males (27.1 ± 7.5%, n=207). Dairy cattle (42.5 ± 2.8%, n=1803) had a significantly higher prevalence than did beef cattle (32.9 ± 1.4%, n=6236). Fall (Sep-Nov, 44.2 ± 2.5%, n=2278) was significantly higher in prevalence than both spring (Mar-May, 31.0 ± 2.1%, n=2835) and summer (Jun-Aug, 25.3 ± 2.8%, n=1406) but not winter (Dec-Feb, 37.9 ± 3.0%, n=1520). Winter had a significantly higher prevalence than summer, but not spring or fall. A trend was observed with the highest prevalence seen in the fall, then winter, spring and the lowest prevalence occurring in the summer. There were no significant differences among the nine different geographical regions in the state. Whereas individual animal prevalence was 35%, the herd prevalence was 81 ± 5%, wherein a herd was positive if 3 or more animals within the herd were sero-positive.

DISCUSSION

Cattle in Missouri had an increase in sero-prevalence in the fall and maintained this increase through winter. Management practices resulting in increased grazing density in dairy herds in the U.S. may account for higher sero-prevalence as compared to beef cattle. Herd prevalence is 81%. *D.v.* appears to be widespread in Missouri with sero-prevalence by ELISA highest in fall and winter. Dairy cattle are more likely to be infected than beef cattle and geographical location of a herd within the state appears to have no effect on prevalence.

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