

Seroprevalence of bovine anaplasmosis in the southern US

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Introduction

Bovine anaplasmosis, caused by *Anaplasma marginale*, is the most prevalent tick-transmitted disease of cattle worldwide and a major obstacle to profitable production in the U.S. The introduction of anaplasmosis into a naïve herd can result in a reduced calf crop and increased cull and mortality rates in infected adult cattle. The cost of anaplasmosis to the US beef industry is estimated to be over \$300 million annually. Control of anaplasmosis in the U.S. is predicated on biosecurity and administration of antimicrobials both of which require knowledge of regional prevalence for implementation to be successful. The last reported prevalence of anaplasmosis in cattle in the southern U.S. ranged from 2% to 24%. However, the test used to determine the prevalence, complement fixation, is no longer considered reliable. Therefore, true prevalence of anaplasmosis in this region is likely much higher than previously reported.

Materials and Methods

To determine the number of cases of anaplasmosis diagnosed in veterinary diagnostic laboratories accredited by the American Association of Veterinary Laboratory Diagnosticians (AAVLD) in the southern U.S. over the past 10 years, serologic and necropsy submission data from 2002 to 2012 pertaining to bovine anaplasmosis was requested from 18 AAVLD laboratories located in 14 southern states.

To estimate the prevalence of bovine anaplasmosis in beef cattle in the southern U.S., blood was collected in 2013 from beef cows consigned to slaughter plants in this region and analyzed for anaplasmosis using a commercial competitive enzyme-linked immunosorbent assay (cELISA; Anaplasma Antibody Test Kit, cELISA; VMRD, Inc., Pullman, WA, USA). Blood was collected

and serum was removed and analyzed for antibody against *A. marginale* by cELISA in accordance with the method described by the OIE and recommended by the manufacturer.

Results

Of the 65,328 samples submitted to the accredited laboratories from 2002 to 2012 in eight southern states 12,281 were seropositive for *A. marginale* [AL (1400/17755: 7.9%), AR (307/1848: 16.6%), KY (388/2903: 13.4%), MS (111/402: 27.6%), NC(1146/10537: 10.9%), SC (24/467: 5.1%), TN (5907/10550: 56.0%), TX (2998/20866:14.4%)]. The overall seroprevalence of the samples submitted from these states to accredited laboratories during this time was 18.8% and ranged from 5.1% to 56.0%.

A total of 977 blood samples were collected from beef cows consigned to slaughter plants originating from 7 southeastern states. Of these 977 samples, 127 were seropositive for *A. marginale* by cELISA [AL (3/24: 12.50%), GA (11/237: 4.64%), KY (25/233: 10.73%), MS (38/117:32.48%), MO (19/54: 35.18%), NC (4/24: 16.67%), TN (26/247: 10.53%), and VA(1/41: 2.44%)]. Therefore, the regional seroprevalence for *A. marginale* in beef cows consigned to slaughter plants in the southeastern U.S. is 13.0% with a range of 2.44% to 35.18%.

Significance

Based upon the seroprevalence of samples submitted to AAVLD accredited diagnostic laboratories for anaplasmosis testing and the seroprevalence of samples from beef cows consigned to slaughter plants in the southern U.S. the true prevalence of anaplasmosis in this region is likely much higher than previously reported.