

Materials and Methods

Twenty-nine animals (13 cases and 16 controls) presenting to the Veterinary Health Center at Kansas State University with a complaint of a single-foot lameness were included in the study. Cases were defined as beef cattle of any gender presenting with a complaint of single-foot lameness where septic arthritis of the DIJ was diagnosed by radiographic examination of the affected digit and/or cytology of the synovial fluid of the DIJ. Controls were defined as adult beef cattle presenting with a complaint of single foot lameness with absence of a diagnosis of septic arthritis of the DIJ. All animals underwent a complete lameness exam including lameness scoring. During lameness examination, the presence of swelling at the coronary band of the affected foot was evaluated and recorded. A lameness score of 0-5 was used where 0 indicated absence of lameness and 5 indicated severe, non-weight bearing lameness. A specific questionnaire was developed to obtain information on exposure of cattle to risk factors. Association between factors and the presence of septic arthritis of the DIJ was evaluated by exact logistic regression analysis.

Results

Duration of lameness, antibiotic treatment, and number of doses of antibiotics were not significantly associated with the diagnosis of septic arthritis of the distal interphalangeal joint in beef cattle from this study ($P > 0.05$). In contrast, a significant association lame beef cattle with a lameness score of 4 or 5 and the presence of asymmetric swelling at the coronary band of the affected foot was observed. The presence of asymmetric swelling at the coronary band and the presence of a lameness score of 4 or 5 significantly increased the odds (25.8 and 19.8, respectively) of septic arthritis of the DIJ in single-foot lame beef cattle in this study ($P < 0.01$).

Significance

Based on the results of the present study, clinical signs such as asymmetric swelling of the coronary band and severity of lameness could be used in field conditions to determine the probability of infection of the DIJ in beef cattle. Rapid identification of septic arthritis of the DIJ could lead producers and veterinarians to seek specialized veterinary services and improve animal welfare.

Investigation of a reported increase in clinical disease attributed to anaplasmosis and babesiosis in Costa Rican dairy herds

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Introduction

Anaplasmosis and babesiosis have been recognized as significant disease entities in Latin America for many decades. As in the United States, seroprevalence varies widely within the country of Costa Rica, dependent on altitude, temperature, vegetation, and other factors. Infection with multiple hemoparasites (*Anaplasma marginale*, *Babesia bovis*, and/or *Babesia bigemina*), along with other comorbidities and management factors, may influence manifestation of clinical disease. This study was undertaken as a field investigation in response to reported concerns of increased sudden death and severe clinical disease in adult animals, as well as unexpected serious disease in younger animals. The aim was to evaluate the infection status and epidemiology of these herds to determine what organisms might be playing a role in disease

and identify potential changes in management that could help mitigate the impact.

Materials and Methods

Six dairies in Costa Rica were selected based on altitude, a history of clinical disease concerns, and willingness to participate in the study. Approximately 50 animals were sampled at each farm, and clinical data and information on management practices were gathered. Serum and whole blood samples were collected and transported on ice back to the US for analysis. Serology was performed using the commercial VMRD *Anaplasma* cELISA and the VMRD *B. bovis* MI-ELISA (license pending) to determine the seroprevalence and epidemiology on each farm. Nested PCR for protozoan 18s ribosomal sequence as well as *Babesia bigemina*-specific

nested PCR were also performed. Packed cell volume and total protein were determined for all animals. PCR testing for additional pathogens is currently being pursued.

Results

Three farms at altitudes less than 800 ft had a very high seroprevalence of both *Anaplasma* and *B. bovis*. All groups out on pasture had animals positive for both diseases, increasing in prevalence with age until all adult animals harbored antibodies to both organisms. *B. bigemina* was also detected by PCR in animals from all 3 of these farms in 22-47% of samples. Anemia was identified in a small percentage of animals, being most common on the farm with the highest prevalence of *B. bigemina*. At high elevations (>4200 ft), infection was much more sporadic. One farm had no samples positive for *Anaplasma*, and all 3 farms had only 1-2 *B. bigemina*-positive animals. Infection with either anaplasmosis or babesiosis was rare in animals less than 2 years of age, even if kept on pasture. Anemia in any age group was also rare, and was only associated with positive test results in 3 animals total.

Significance

Costa Rica is known to be endemic for *A. marginale*, *B. bovis*, and *B. bigemina*, as described in multiple seroprevalence studies. However, this endemicity applies only to certain geographical regions, and prevalence of these pathogens can vary with changes in weather patterns and management factors. Low altitude herds in this study were endemic for both anaplasmosis and babesiosis, with the reported clinical disease in young animals likely reflective of overwhelming challenge by multiple hemoparasites at the time of turnout on pasture. It would be impossible and inadvisable to eliminate either disease in such a scenario, therefore disease management necessitates optimal support of overall health and nutrition, balanced tick control, and potential vaccination or treatment with prophylactic antibiotics. In high altitude herds, the disease pattern and presentation was consistent with an outbreak scenario in a herd with minimal pre-existing immunity. These herds would be best served by attempting to eradicate anaplasmosis and babesiosis and prevent future exposure by testing all incoming animals, controlling exposure to ticks, and avoiding iatrogenic transmission through reuse of needles or blood-contaminated equipment.

Validation of commercial luminometry swabs for enumeration of total bacteria and coliform counts in colostrum feeding equipment

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Introduction

Colostrum feeding is an integral component of neonatal calf care with many effects on calf health and productivity, yet failure of passive transfer remains common on many dairy farms. A sufficient quantity and quality colostrum must be fed quickly to the newborn calf while minimizing bacterial contamination. Colostrum with a total bacteria count (TBC) >100,000 cfu/ml may impair IgG absorption and contribute to disease. Adenosine triphosphate ATP bioluminescence swabs offer a potential rapid calf-side alternative to traditional bacterial culture. The reagents in the swabs produce a light-generating reaction when in contact with bacterial adenosine triphosphate, which is quantified in relative light units (RLU) with a luminometer. The objective of this study was to validate the Hygiena™ AquaSnap (AS), SuperSnap(SS), PRO-Clean (PC) and MicroSnap (MS) swabs as well as visual hygiene assessment for detection of elevated bacterial counts in or on colostrum-feeding equipment.

Materials and Methods

From April to October 2016, 18 esophageal tube feeders, 49 nipple bottles and 6 pails from 52 dairy farms in Ontario were evaluated for cleanliness. Following visual hygiene assessment, sterile physiological saline (15 ml) was poured into each piece of equipment, mixed for 2 minutes to ensure total surface coverage and poured into a sterile collection container through the feeding end. All wash fluid was split into equal aliquots, with one being evaluated by conventional culture and the other evaluated using the luminometry swabs. Non-parametric receiver operator curves were generated using STATA 14 for each of AS, SS, PC and MS, comparing the RLU to bacterial counts.

Results

The area under the curve (AUC) comparing the AS swab to TBC (cut point >100,000 cfu/ml) was 0.89 (95%