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 HygienaTM 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%

Confidence Interval (CI): 0.8-1) and using a cut point of 631 RLU correctly classified 84% of samples with a sensitivity of 88% and a specificity of 77%. The AUC comparing the MS swab to total coliform count (cut point >100,000 cfu/ml) was 0.85 (95% CI: 0.7-1) and using a cut point of 44 RLU correctly classified 89% of samples with a sensitivity of 83% and a specificity of 90%. Visual hygiene assessment, PC and SS swabs were not reliable indicators for feeding equipment cleanliness.

Significance

A significant number of the colostrum feeding equipment evaluated had bacterial contamination >100,000 cfu/ml TBC and >10,000 cfu/ml TCC. The AS and MS performed well when evaluating wash fluid from the equipment and provide a calf-side alternative to traditional laboratory methods to evaluate cleanliness of colostrum feeding equipment.

Risk factors associated with early mortality identified on arrival to a milk-fed veal facility

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Introduction

The veal industry continues to have significant calf losses during the growing period representing a serious challenge to animal welfare and economic sustainability. As the majority of the mortality occurs in the first 21 days following arrival to veal farms, on arrival health status may be an important predictor of calf mortality. The objectives of this prospective case-control study were to describe the health status of male calves arriving at a veal farm and determine the risk factors associated with mortality in the first 21 days following arrival.

Materials and Methods

Using a standardized health scoring system (Calf Health Scorer, University of Wisconsin-Madison, Madison, WI), calves were evaluated immediately upon arrival to a commercial veal facility in Ontario. Data on weight at arrival and the supplier of the calf were also recorded. The calves were followed until death or the end of the first 21-day period after arrival. Cases were defined as calves that died within the first 21 days following arrival. Controls were randomly selected from those who survived more than 21 days and arrived the same day and housed in the same barn as cases. The variables navel score, respiratory score, fecal score, attitude score, rectal temperature, weight on arrival, and source of calves were offered to a conditional logistic regression model.

Results

A total of 5,010 calves were evaluated from November 2015 to September 2016. The mortality risk in the first 21 days was 2.8% leaving a total of 135 cases and 270 controls. There were 4 variables that were significant in the final model. A slightly enlarged navel with slight pain or moisture was found in 20% and had an increased odds of early mortality (OR: 1.9; P=0.04). A significantly enlarged navel with heat, pain and/or malodorous discharge was found in 6% of calves and also increased the odds of early mortality (OR: 3.4; P<0.01). A total of 2.2% of calves were severely depressed on arrival, which significantly increased the odds of mortality (OR: 14; P=0.02). The majority of calves were sourced from drovers, whom pick up calves from multiple dairy farms and brought the calves directly to the veal farm. Drover derived calves had a lower odds of mortality (OR: 0.43; P<0.01) when compared to calves dropped off directly by local dairy producers. The average weight on arrival was 102 lb and heavier calves were less likely to perish (P<0.01). Diarrhea, fever and pneumonia were found in 13%, 24% and 7% of calves, respectively, however these variables were not associated with mortality.

Significance

A significant number of calves are entering into the veal facility with identifiable health abnormalities representing a significant welfare concern. The results also demonstrate that calves at risk for early mortality can be identified upon arrival. This represents a potential opportunity to selectively intervene on these calves to reduce mortality levels. However, prevention of these conditions prior to arrival needs to be further explored and encouraged.