

Characterization of neonatal beef calf behavior and associations with weight gain and intake of colostrum immunoglobulins

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Introduction

Failure of adequate colostrum intake in neonatal calves contributes to increased morbidity and mortality in both beef and dairy calves. Characterizing neonatal calf behavior predictive of future production has not been fully explored in beef cattle. Research objectives included characterization of behavioral indices from birth until day 7 in beef calves born to primiparous (Calves-H) and multiparous dams (Calves-C). Evaluation of body weight, serum total protein, and IgG concentrations were performed to determine correlations between activity, transfer of passive immunity, and weight gain during the first 7 days of life.

Materials and Methods

Activity data were collected from a total of 70 mixed breed beef calves using accelerometers (IceQube™, IceRobotics™). Accelerometers were placed on the hind limb of calves within 6 to 8 hours of birth, and body weight and blood samples were collected on day 0 and 7. The number of steps, standing time, lying time, and number of lying bouts were

continuously recorded at 15-minute intervals throughout the study period.

Results

Calves-C had significantly higher IgG concentrations and increased weight gains compared to Calves-H. A positive correlation between change in body weight and IgG status on day 7 was present for both Calves-C and Calves-H. For Calves-C, but not calves-H, statistically significant correlations existed between serum IgG concentrations and behavioral indices, indicating that calves with greater intake of colostrum were less active than calves with lower rates of passive transfer. Although not statistically significant, Calves-C with higher weight gains also tended to take fewer steps than Calves-C with lower weight gains.

Significance

Characterization of neonatal calf behaviors and their correlations with weight gain and immune status were achievable in pastured beef calves using accelerometers.

A descriptive analysis of the commensal luminal and mucosal microbiome of the duodenum using a cannulated calf model

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Introduction

The gut microbiome provides important metabolic functions for the host animal. Bacterial dysbiosis as a result of bacterial, viral, and parasitic gastrointestinal infections can adversely affect the metabolism, productivity, and overall

health. The objective of this study is to characterize the commensal microbiome present in the lumen and the epimural surface of the duodenum of cattle, as we hypothesize that due to metabolic processes and/or host properties, there are differences in the natural microbiota present in the epimural surface and luminal contents of the bovine duodenum.