

Research Summaries 3

Predicting bull mounting behavior using classification algorithms

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Introduction

Data from multiple-sire beef cattle pastures have shown variability exists among the number of calves sired per bull. The reason(s) for the variability is unknown. Successful investigation of possible reasons requires accurate recording and evaluation of bull behavior. The purpose of this study was to assess the accuracy of classifying bull mounting events in a multiple-sire pasture using accelerometer data and classification algorithms.

Materials and Methods

Two bulls and 10 estrus-synchronized cows were placed in a pasture for 4 days. Accelerometers were attached to each bull's left ear, right ear, neck, and wither, and data were simultaneously logged to video to quantify the time and duration of each behavior. Video data and accelerometer data were combined based on the time the behavior event occurred. Data were sub-grouped and analyzed as single and multiple datasets, based on the tag location on the bull. Fifty

percent of the data was randomly partitioned for training the algorithms to identify specific mounting behavior, 25% was randomly partitioned for testing in order to refine the algorithms, and 25% of the data was used for validation to determine accuracy of each algorithm. Accuracies were compared between the different classifiers for each sub-group.

Results

The prevalence of a mounting event ranged from 0.6% to 0.7% of the total time available for each sub-group. The accuracy of the best performing classifier ranged from 74% to 78%.

Significance

Mounting events by bulls are difficult to classify with high accuracy using accelerometer data because of the low prevalence of mounting events and imperfect specificity of the algorithms to classify mounting events.

Ulcerative penile lesions in beef bulls due to pseudocowpox virus

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Introduction

An Angus-cross cow-calf operation in Montana has had a 4-year history of bulls developing ulcerative penile lesions and refusal to breed 3 weeks into the breeding season. The problem appeared to move through the herd affecting the bulls exposed to 1 breeding group the first year, 2 breeding groups the second year, and bulls exposed to all breeding

groups the third year. No vaginal exams were performed on the cows prior to our involvement. Calving rate was high in the herd all 4 years, however; the owner was using twice the number of bulls necessary to maintain this. The penile lesions on the bulls would appear to heal within 2 to 3 weeks of sexual rest and the bulls would be returned to the breeding herds at that time. Bulls with lesions that were retained for multiple years would get lesions multiple times in 1 season