Pattern recognition of feeding and drinking behavior as a tool in early identification of diseased feedlot animals

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The health status of feedlot animals impacts calf welfare and the economic returns to the producer. GrowSafe (GrowSafe Systems Ltd., Airdrie, AB, Canada), a system that records feeding and drinking behavior continuously, has been shown to detect animal morbidity between 5 and 7 days earlier than visual appraisal by feedlot staff. However, it has only been validated using traditional observational methods for evaluating health status. The study objectives were (1) to validate GrowSafe® technology using laboratory parameters as additional indicators for disease status; and (2) to develop and validate an algorithm to identify sick animals in early stages of disease. A total of 746 auction-derived mixed breed calves from 2 southern Alberta commercial feedlots, equipped with the GrowSafe® system, were included in the study. Upon arrival, animals were processed according to a standardized protocol, ear tagged with a radio frequency tag for individual identification, bled and randomly assigned into 2 pens on each farm. Feeding and drinking behavior was recorded for 5 weeks. Animals identified as diseased by feedlot staff were examined and bled, and treated if necessary. Disease status was confirmed by complete blood count, total plasma protein, plasma fibrinogen, haptoglobin and serum amyloid α. A prediction model for morbidity using the laboratory parameters as additional assessments for disease status was developed and validated using a random sample of feedlot animals. Results and detailed methods will be presented. We anticipate that by creating a well-defined algorithm, diseased animals can be identified significantly earlier using behavior data compared to observational methods.