Chute behavior of cattle handled using low-stress handling techniques

Objectives

1. Collect audio and video data during initial processing events for cattle handled using low stress cattle handling techniques (LSCH) and conventionally handled cattle.

2. Create an ethogram to accurately and precisely score the two groups of cattle.

3. Compare the scoring differences between the control group and LSCH group.

Introduction

Bovine Respiratory Disease and its Causes and implications:

- Multifactorial syndrome.
- Negatively impacts performance and welfare.
- Associated with viral and bacterial pathogens; but other causal factors include management techniques and environmental stresses (Taylor et al., 2010).
- Leading production cost to feedlot operators through mortality, morbidity, preventative and treatment medications.

Ambiguous as to which factor is the leading cause or the most important factor to address when aiming to reduce the occurrence of BRD in feedlot cattle (Taylor et al., 2010).

Acclimation and Low-Stress Handling to Reduce Stress:

- Cattle encounter numerous stressful events throughout their life span such as weaning, transportation, exposure to pathogens, social re-organizing, and dietary changes (Hodgson et al., 2012).
- Acclimation methods allow the cattle to become familiar with their environment.
- Low stress handling methods use the natural behavior and innate responses of cattle to minimize negative consequences potentially associated with handler interactions.
- Younger animals may be more impressionable; therefore, this is when acclimation efforts should begin.
- Dr. Temple Grandin has found that acclimated individuals may exhibit greater productivity as a result (Hodgson et al., 2012).
- Effective acclimation practices should minimize physical harm, because the animal will associate pain with the environment they are in during the event.
- One of the goals of acclimation methods is to decrease the number of conditioned fear responses an animal has throughout its life for welfare, handler safety, and productivity.

Materials and Methods

- Five pens of cattle were randomly assigned to the control group.
- Five pens of cattle were randomly assigned to the LSCH group.
- LSCH group was acclimated for 15-20 minutes upon arrival and 2 more times within first 5 days after Day 1.
- Moved through processing shed and squeeze chute, then back to home pen.
- Control group was not handled during acclimation of LSCH group.
- Day 3 = all cattle were processed (vacination, deworming, growth implant, ear tag identification) this was the enrollment collection date.

Data Collection:

- Two Sony HandicamsSM were placed to capture the side and front area of the chute.
- PlayMemories™Home was used to cut and splice together the two views for each calf.
- Edited videos were blinded in a randomized order and observed by a single trained observer.
- Ethogram was designed to measure:
  - Frequency of vocalizations.
  - Chute behavior (1=calm; 2=restless; 3= frequent contact with chute; 4=violent struggling).
  - Exit behavior (1=walk; 2=run/jump; 3=freeze).
  - Calf fell upon exiting (Y/N).

Vocalization frequencies were analyzed using a generalized linear model with treatment as a fixed effect and calf (pen) as a random effect. Chute and exit scores and whether a calf fell were analyzed using a probit regression model with treatment as a fixed effect to assess probability of calves being assigned a particular score (chute and exit scores) and probability of calves falling upon exiting the chute.

Results

- Vocalization frequencies between control and LSCH (2.04±0.27 and 2.63±0.47, respectively; p=0.37).
- Chute scores (p=0.10).
- Exit scores (p=0.39).
- Probability of falling upon exit (p=0.25).

* A p-value < 0.05 would demonstrate a significant difference between the LSCH and control group for these behaviors on Day 3.

Chute Score Percentages: Refer to Figure 5.

- Score of 1: 83.57%
  - Of this percentage, 33.33% were acclimated.
  - Of this percentage, 17.26% were acclimated.
  - Of this percentage, 3.57% were acclimated.
- Score of 2: 41.97%
  - Of this percentage, 19.64% were acclimated.
  - Of this percentage, 11.90% were acclimated.
- Score of 3: 0.00%
  - Of this percentage, 0.00% were acclimated.

Exit Score Percentages: Refer to Figure 6.

- Score of 1: 19.64%
  - Of this percentage, 8.53% were acclimated.
  - Of this percentage, 3.00% were acclimated.
  - Of this percentage, 3.00% were acclimated.
  - Of this percentage, 11.90% were acclimated.
- Score of 2: 30.00%
  - Of this percentage, 14.90% were acclimated.
  - Of this percentage, 6.00% were acclimated.
  - Of this percentage, 8.53% were acclimated.
- Score of 3: 30.36%
  - Of this percentage, 11.90% were acclimated.

Discussion

- Demonstrated no observed effect of LSCH on chute behavior on Day 3 after arrival.
- Unable to conclude that acclimation and LSCH techniques affect chute behavior as early as the enrollment collection date.
- Further analysis at later time points in the production cycle, following more extensive acclimation and LSCH processes, will provide important information on potential effects of these techniques.

References

- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2942046/.