

The effects of handling intensity at time of processing on physiological response, immune response, and vaccination status in beef cattle at the feedlot

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Introduction

Newly received feeder calves are often experience stress upon arrival at the feedlot due to weaning, commingling, transportation, marketing, nutrition, handling and others. Many of these factors are out of the control of the feedlot receiving the cattle, however cattle handling upon arrival and at processing is a controllable aspect. The objectives of this study was to determine the effects of cattle handling intensity at processing had an effect on stress markers in newly received feeder calves relating to the physiological, inflammatory and the immune response.

Materials and Methods

Crossbred heifers (n=80, BW =355+/- 24 kg) from a single cohort of cattle were used for this study at a commercial cattle feeding facility in central Nebraska. These heifers used over a 42 d period in a simple randomized design study to evaluate the effects of 2 handling treatments: 1) low stress handling or 2) aggressively handled. The treatments were defined as:

Low stress handling (LSH): Cattle walked calmly and quietly through a crowding tub and snake processing facility up to a hydraulic chute. Electric prods and striking were not permitted. Noise from the handlers was kept to a minimum.

Aggressive handling (AH): Cattle moved through the crowding tub and snake processing facility at a lope. An electric prod was applied twice (1 s per impulse) before entering a hydraulic chute. A radio was playing next to the hydraulic chute and yelling and whistling were encouraged.

Baseline measurements were taken before assigned handling treatment were applied. Immediately after handling treatment, cattle underwent a physical examination and blood samples were drawn for physiological, inflammatory and immune responses. All cattle were vaccinated with a 5-way modified live viral vaccination including Infectious Bovine Rhinotracheitis Virus (IBR), Bovine Viral Diarrhea Virus (BVD) types I & II, Parainfluenza virus (PI3), and Bovine Respiratory Syncytial Virus (BRSV) antigens (Merck & CO, Madison, NJ). After processing, post treatment body weights, physical examination and blood samples were taken on day 5, 21 and 42 to better understand the effects of cattle handling

intensity on physiological, inflammatory and immunological responses.

Results

Cattle administered the AH treatment had higher respiratory rates (P=0.017) and tended to have higher heart rates (p=0.09) than the LSH cattle immediately after treatment administration. Low stress handling cattle tended to have lower epinephrine (P=0.06) and had lower norepinephrine plasma concentrations (P=0.05) than AH cattle immediately post-treatment. Aggressively handled cattle had higher D-lactate concentrations compared to LSH cattle at post-treatment (P<0.0001). Cattle in the AH treatment group had higher serum amyloid A concentrations at post-treatment (P=0.0002) than LSH cattle. Cattle handling did not have an effect on serum IBR, PI3, or BRSV titers (P>0.30) in newly received over the 42 day study.

Significance

The results of this study indicate that low stress cattle handling at processing significantly has a significant impact on decreasing cattle stress and directly improves the physical, physiological and inflammatory responses compared to cattle that are mishandled.