EXTENSION
BEEF CATTLE RESEARCH UPDATE
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Impacts of a Post-Transport/Pre-Processing Rest period on Growth Performance in Cattle Entering a Feedyard

Beef cattle are exposed to stress at multiple points throughout their life. Transportation is generally regarded as stressful to cattle, particularly for feeder calves.[1,2,3] Some stresses, like transportation, are unavoidable. Transportation of cattle in the United States occurs in many facets such as movement through livestock auctions, to feedlots, and eventually to processing facilities. Thus, cattle may be transported several times in their lifetime. The stress induced from transport can predispose calves to dehydration, reduced feed intake, inhibition of immune function, and increased susceptibility to bovine respiratory disease (BRD).[4] Many methods have been adopted to decrease the severity of transport stress in newly received cattle. Preconditioning cattle by ensuring adequate weaning time prior to transport, vaccinating, castrating, dehorning, and treating with anthelmintics has been proven extremely effective.[5] Delaying processing upon arrival to a feedlot might also counteract the stress associated with transport. Once received by a feedlot, cattle are typically placed into a receiving pen and allowed to rest, which is then followed by processing and placement into feedlot pens.[6] Kansas State University research evaluated the impact a post-transport rest period had on calf growth performance, mortality, and morbidity.[7] This study also aimed to determine if a rest period affected calf response to anthelmintics and blood serum metabolites.

In this study, 80 crossbred heifers (551 lb initial weight) were transported approximately 300 miles from an Oklahoma City, Oklahoma sale barn to the Kansas State University Beef Cattle Research Center (Manhattan, Kansas) via semi-truck, with a total transit time of approximately 6 hours. The heifers were considered high-risk and originated from a geographic area high in parasites. Upon arrival, the heifers were unloaded and randomly placed into one of four receiving pens and provided ad libitum hay and water. Each pen (20 heifers/pen) was randomly assigned to one of four treatments of varying rest times before processing: (1) immediately upon arrival; (2) after a 6-hour rest period; (3) after a 24-hour rest period; and (4) after a 48-hour rest period. Processing was considered day 0 for the trial. After all cattle were processed, heifers were allotted into individual pens with ad libitum access to a receiving ration and water.

At processing, all heifers were tagged, weighed, and subcutaneously injected with Cydectin (Bayer Animal Health) and orally dosed with Synanthic (Boehringer Ingelheim Animal Health). Heifers were also subcutaneously injected with Draxxin (Zoetis Animal Health), a recombinant Mannheimia haemolytica leukotoxoid vaccine (Nuplura PH, Elanco Animal Health), and a modified-live virus vaccine (Titanium 5, Elanco Animal Health) containing infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (types 1 and 2), bovine respiratory syncytial virus, and parainfluenza 3. Finally, heifers were implanted with Revalor-H (Merck Animal Health). After processing, cattle were returned to their receiving pen until all cattle had been processed at 48-hous after arrival to the facility. The heifers were weighed individually on days 0, 7, 14, 21, 28, and 35 to calculate average daily gain (ADG). Feed was individually weighed and delivered to each heifer twice daily, with refusals collected and weighed daily to determine dry matter intake (DMI). A fecal egg count reduction test and analysis of blood serum metabolites were also conducted.

Growth performance, mortality, and morbidity data are presented in Table 1. Processing time did not impact heifer body weight (BW) or ADG for the duration of the experiment. Over the overall experiment, (day 0 to 35), DMI decreased linearly ($P = 0.027$) as rest time increased. The number of days for heifers to reach a DMI of 2.5% of BW was linearly increased ($P = 0.023$) as time of rest increased, with heifers processed at 0, 6, 24, or 48 hours requiring 18, 15, 18, and 20 days to reach this parameter, respectively. Similarly, rest time impacted ($P = 0.038$) the percentage of heifers that reached a targeted DMI of 2.5% of BW by day 14 of the experiment, with 25.0%, 60.0%, 52.6%, and

23.5% of cattle reaching this parameter after 0, 6, 24, and 48 hours of rest prior to processing, respectively. Gain efficiency did not differ (P ≥ 0.70) between rest times. Morbidity did not differ between treatments (P > 0.10), whereas mortality increased linearly (P = 0.026) as the time of rest increased. This increase was due to the loss of two experimental animals in the 48-hour treatment on day 2 of the study.

Table 1. Impact of time of processing on feedlot heifer growth performance, mortality, and morbidity

	Processing time after arrival, hours[1]				P-value		
Item	0	6	24	48	Treatment	Linear	Quadratic
Weight, lb							
Day 0	551	556	542	556	0.858	0.980	0.473
Day 14	593	595	587	598	0.949	0.896	0.654
Day 35	664	675	662	668	0.902	0.992	0.835
ADG, lb/day							
Day 0-14	2.9	2.9	3.3	2.9	0.879	0.750	0.493
Day 14-35	3.3	3.7	3.5	3.3	0.624	0.693	0.509
Day 0-35	3.3	3.3	3.3	3.3	0.678	0.945	0.311
DMI, lb/day							
Day 0-14	11.5[ab]	11.9[a]	11.2[ab]	10.8[b]	0.031	0.012	0.635
Day 14-35	19.8	20.7	19.2	18.7	0.150	0.072	0.937
Day 0-35	16.3	17.2	15.9	15.4	0.057	0.027	0.956
DMI, % of BW							
Day 0-14	2.11	2.16	2.09	1.93	0.091	0.020	0.344
Day 14-35	3.37	3.50	3.29	3.15	0.239	0.075	0.782
Day 0-35	2.98	3.10	2.97	2.80	0.183	0.061	0.426
Gain:Feed							
Day 0-14	0.25	0.24	0.29	0.26	0.645	0.507	0.368
Day 14-35	0.17	0.18	0.18	0.18	0.891	0.626	0.936
Day 0-35	0.20	0.20	0.21	0.21	0.703	0.375	0.471
Days to 2.5% of BW DMI	18[ab]	15[b]	18[ab]	20[a]	0.030	0.023	0.393
Prevalence, %							
Mortality	0.0	0.0	0.0	10.5	0.096	0.026	0.236
Morbidity	0.0	0.0	5.3	0.0	0.382	0.806	0.113
Cattle to 2.5% of BW by day 14	25.0	60.0	52.6	23.5	0.038	0.354	0.025

[ab]Means within a row that do not share a common superscript differ (P < 0.05).
[1]Cattle were processed at either 0, 6, 24, or 48 hours after their arrival to the research facility.
Adapted from Dahmer et al., 2022.

These researchers concluded that rest time prior to processing did not impact receiving calf growth performance. Their data did suggest that 6 hours, or approximately 1 hour of rest per hour of transport time, was the most beneficial to maximizing DMI during the first 14 days after arrival to the feedlot. Anthelmintic treatment at processing reduced the parasitic load in all heifers, regardless of their rest time upon arrival. Vaccine titer did not increase after initial processing in heifers processed 24- or 48-hours after arrival, indicating the seroconversion of IBR antibodies during the longer rest period.

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