



# BEEF CATTLE RESEARCH UPDATE

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## **Effects of Delayed Processing on Hydration Status, Health and Performance of Newly Received Feedlot Heifers**

Calves arriving at the feedlot are often subjected to prolonged periods of water deprivation during marketing and transportation. Research has suggested that dehydrated calves are more susceptible to disease due to the inability to clear inhaled pathogens and compromised antibody responses to invading pathogens. Thus, New Mexico State University research evaluated the effects of delayed processing on calf hydration status, subsequent health and performance of newly received feedlot heifers.<sup>1</sup>

This study used 224 crossbred heifers (initial weight = 411 lb) blocked by two truckloads which were assigned to 16 pens and two treatments. Treatments were initial processing upon arrival or a 24 hour delay in initial processing, after 12 hours of transportation (720 miles) on a truck. Calves assigned to the delayed processing treatment were allowed access to wheat hay, a receiving ration, and fresh drinking water during the 24 hour delay. At initial processing, the heifers were individually weighed, ear tagged, dewormed, vaccinated and received no metaphylactic antibacterial treatment. On days 1, 2, 3, and 28 of the experiment, the heifers were individually weighed and rectal temperatures were obtained. Jugular blood samples collected on days 0 (arrival calves only), 1, 2, 3 and 14, were used for hematocrit measurement as indicator of hydration status of calves. Health was monitored throughout the 56 day experiment and pen weights were obtained on day 56.

In this trial delaying initial processing by 24 hours did not significantly affect ( $P \geq 0.10$ ) heifer hematocrits, health, or performance. Morbidity tended ( $P = 0.14$ ) to be greater for delayed processing (70.54%) than arrival processing calves (60.71%). In addition, average daily gain tended to be lower for delayed than arrival calves from days 1 to 28 (0.99 vs. 1.25 lb;  $P = 0.13$ ) and days 1 to 56 (1.95 vs. 2.12 lb;  $P = 0.12$ ). Feed efficiency (feed to gain ratio) also tended to be poorer for delayed than arrival from days 1 to 28 (8.18 vs. 6.43;  $P = 0.10$ ) and days 1 to 56 (5.33 vs. 4.99;  $P = 0.14$ ).

These researchers concluded that delaying initial processing by 24 hours after 12 hours of transportation was not enough time to allow calves to sufficiently rehydrate to observe health and performance benefits. Postponing initial processing delays exposure to many stress factors and may cause dehydration to the same magnitude as 12 hours of transportation stress.

## **Effect of Route of Vaccine Administration (Subcutaneous vs. Intranasal) on Health and Performance of Receiving Heifers**

Receiving calves are routinely vaccinated upon arrival to reduce the incidence of Bovine Respiratory Disease. The major route of vaccine administration in cattle is via injection through either intramuscular or subcutaneous routes. However, in recent years several products have been introduced that utilize the intranasal route of vaccine administration. The use of intranasal vaccines potentially offer several advantages: 1) Alleviate concerns that injections pose for Beef Quality Assurance programs, 2) May be less stressful on the animal, and 3) Vaccine is delivered directly to the site of infection in the case of respiratory pathogens, and may provide a different adaptive immune response to the vaccine. Thus, Kansas State University research determined the effects of route of administration of the *Mannheimia haemolytica* and *Pasteurella multocida* fractions of a vaccine regimen on receiving cattle growth performance, health, and mortality.<sup>2</sup>

This study used 388 cross-bred heifers (497 lb) purchased from sale barns. The heifers were randomly assigned to pens of 11 to 13 head and the pens were then randomly assigned to one of 2 treatments (16 pens per treatment). Treatments consisted of Vista Once SQ (Merck Animal Health, Madison, NJ) given subcutaneously at initial processing or Vista 5 SQ (Merck Animal Health, Madison, NJ) given subcutaneously plus Once PMH IN (Merck Animal Health, Madison, NJ) administered intranasally at initial processing.

In this 45 day receiving trial, that were no differences in body weight gain, average daily gain, feed intake, feed efficiency, morbidity, or mortality between routes of vaccine administration treatments. Morbidity (~4%) and mortality (only one dead) were quite low in this study. Thus, these researchers concluded that route of vaccine administration in cattle experiencing a low disease challenge did not impact performance or health measurements.

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<sup>1</sup> Oosthuisen, E. R., M. E. Hubbert, J. R. Graves, C. A. Löest, and E. J. Scholljegerdes. 2017. Hydration status, health and performance of newly received feedlot heifers in response to delayed processing. In: 2017 Plains Nutrition Council Spring Conference, San Antonio, TX. p. 102-103 (Abstr.).

<sup>2</sup> Spore, T. J., M. E. Corrigan, T. R. Parks, C. S. Weibert, M. L. DeTray, W. R. Hollenbeck, R. N. Wahl, and D. A. Blasi. 2017. Route of Mannheimia haemolytica and Pasteurella multocida vaccine administration does not affect health or performance of receiving heifers. Kansas Agricultural Experiment Station Research Report Cattlemen's Day Beef Cattle Research Vol. 3: Iss. 1: 17-19. .Available: <https://dx.doi.org/10.4148/2378-5977.1339>.