BEEF CATTLE RESEARCH UPDATE

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Does Delaying the Initial Feedlot Implant Improve Health by Reducing Stress?

Bovine respiratory disease (BRD) is the most common and costly beef cattle disease in the United States. Numerous studies have indicated that BRD morbidity and the extent of medical treatment have major consequences on feedlot performance and carcass traits. Research showed that the economic loss associated with lower gains and treatment cost for BRD infection in a 1,000 head feedlot was $13.90 per animal, not including labor and associated handling costs. [1]

Many stressors influence post-arrival health of cattle at the feedlot and nutrient intake, including weaning, marketing, transportation, co-mingling, genetics, previous nutrition, and health history. These stressors can negatively affect the immune system at a time when the animal is more likely to be exposed to infectious agents within the bovine respiratory disease complex. Feedyards commonly implant newly received cattle shortly after arrival to improve performance and economic returns. The stress that occurs during the receiving period may result in nutrients being shunted towards the immune system which might result in implants being less effective during this period.

For this reason, Kansas State University researchers evaluated whether delaying the initial feedlot implant might reduce post-transit stress and improve carcass quality of feedlot cattle.[2] In this study, 1,601 beef calves (604 lb initial weight) were shipped to a commercial feedlot in central Kansas where one-half the calves were implanted with Revalor XS at initial processing (day 1) and the rest of the calves received the same implant on day 45 post-processing.

These authors reported that cattle performance and carcass characteristics were not affected by delaying the initial implant by 45 days. In addition, there was no difference in morbidity, case fatality rate, or death loss due to BRD for cattle that received their implant on arrival compared with delayed-implant cattle. These data suggest that high-risk calves can be implanted upon feedlot arrival without increasing risk of disease or harming performance.

In an additional Kansa State University feedlot study, 408 crossbred heifers (440 lb initial weight) were used to evaluate the effects of timing of an initial implant on overall performance, carcass characteristics, and health.[3] The heifers were not implanted (CON), implanted at initial processing (IMP0), or implanted 21 days after initial processing (IMP21). The initial implant was Revalor-H and all heifers received a terminal Revalor-200 implant on day 126 of the 222 day feeding period.

As would be expected, during the first 21 days of the trial, heifers that were implanted at initial processing gained significantly ($P < 0.05$) faster and more efficiently than the other two groups. During the second 21 day period (days 22 to 42), gains were greater ($P < 0.05$) for the IMP21 (3.64 lb/day) and IMP0 heifers (3.16 lb/day) compared to the CON heifers (2.48 lb/day). Over the last half of the finishing period (day 127 to 222), feed intake was

higher (P ≤ 0.05) for IMP21 (18.4 lb/day) than CON (17.1 lb/day) and IMP0 (17.6 lb/day), but gains and efficiency were not affected (P ≥ 0.12) by treatment. Over the entire 222 day trial, gain was higher (P ≤ 0.05) for IMP21 (3.08 lb/day) than CON (2.89 lb/day) and intermediate for IMP0 (2.97 lb/day), but efficiency was not affected (P = 0.25). Heifer carcass weight was greater (P ≤ 0.05) for IMP21 (711 lb) than CON (690 lb), and IMP0 (701 lb) was intermediate. No other carcass characteristics were affected by treatment. The incidences of morbidity and mortality were also not affected by treatment (P ≥ 0.44).

These researchers concluded that delaying the initial implant by 21 days did not negatively affect overall feedlot performance. However, the greater carcass weight with delayed implanting may have economic implications dependent upon how the cattle are marketed.

In summary, both of these studies suggest that cattle performance and carcass characteristics are not affected by delaying the initial implant. Furthermore, morbidity and mortality were not altered by delaying the initial implant. Thus, feedlot calves can be implanted upon feedlot arrival without increasing the risk of disease or harming performance.

Timing of Castration in Nursing Calves

A 2007-08 USDA survey of U.S. beef cow operations found that about 59.2% of operations castrated any bull calves prior to sale.[4] The percentage of operations that castrated bull calves prior to sale increased as herd size increased (50.3, 75.0, 85.1, and 95.3%, respectively, for herd sizes of 1-49 cows, 50-99 cows, 100-199 cows, and 200+ cows). This same survey reported that most operations (74.5%) castrated bull calves at an average age of less than 93 days, but almost one of five operations (18.4%) did not castrate calves until they were over 122 days old.

It is well documented that castration of feeder calves on arrival or shortly after arrival at a feedlot decreases daily gains and increases morbidity.[5,6] As a result, when purchasing feeder calves, bulls are typically discounted relative to steer calves.

Recent Kansas State University research focused on evaluating the effects of castration on calves that are castrated post-arrival relative to those castrated before arrival and estimating appropriate discounts for bull versus steer calves.[7] Data on 3,380 male calves (2,197 bulls and 1,183 steers) used in 11 receiving trials from March 2006 to October 2008 was analyzed. This analysis showed that surgical castration of calves after arrival reduced daily gains by 9.6% (0.35 lb/day) as compared to steers over a 44-day receiving period. These researchers reported that based on 2009 market conditions, bulls should be discounted at feeder calf sales compared with steers. At the average arrival weight in these trials (461 lb), bulls should be discounted $4.99/cwt relative to the same body weight steers. The discount increased to $5.44/cwt for 375 lb calves and decreased to $3.63/cwt for 551 lb calves. These discounts are similar to the $6.31/cwt discount recently reported by University of Arkansas researchers in which data was collected from 14 Arkansas auction barns in 2010 on 38,346 lots consisting of 79,822 head.[8]

Recent University of Florida research investigated whether timing of castration in nursing calves affected calf performance and weaning weight.[9] In this study, 93 Angus and Brangus calves were either surgically castrated early (average age of 36 days) or late (average age of 131 days). The age of the early castrated calves ranged from 3 to 73 days and the age

of the late castrated calves ranged from 84 to 180 days. At the time of castration, the average body weight of the late castrated calves was 356 lb. Calf birth weights were similar between treatments (~80 lb). Actual weaning weight (456 vs. 452 lb), adjusted 205-day weaning weight (512 vs. 504 lb), and average daily gain from birth to weaning (2.00 vs. 1.92 lb) were all similar between early and late castrate treatments, respectively.

In summary, no differences in early and late castration were observed in this trial. These researchers concluded that this data indicates that producers have some degree of flexibility in determining when to implement castration. The data showed that castration at or near birth did not have a detrimental effect on calf performance or weaning weight. These authors also suggested that producers should realize that delaying castration until calves are approximately 131 days old will not bring added weight at weaning despite some producer philosophies and marketing claims that endorse such management practices.

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