BEEF CATTLE RESEARCH UPDATE

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Effect of Early Weaning on Feedlot Performance and Measures of Stress in Beef Calves

Early weaning of calves is an effective way to get high rebreeding rates even in very thin cows. It can be an attractive alternative during certain situations such as a drought when large amounts of purchased forage would be necessary to maintain a cow herd through to normal weaning time or when cows are already to thin to rebreed[1]. Care of the early-weaned calf is an important consideration. Producers who early wean have two basic options: 1) market the calf immediately after early weaning or 2) manage the calf on pasture or drylot. Illinois, Kansas, and Ohio research have shown that early weaned calves that are placed on a high-concentrate diet at weaning generally gain more efficiently than normal weaned calves in the feedlot[2,3,4,5] and produce higher quality carcasses (more calves grade choice or better)[4,5,6].

University of Florida researchers[7] recently investigated the differences in stress tolerance between normal-weaned calves and calves that were early-weaned and managed on the ranch for about 200 days before shipping and receiving into a feedlot. In this experiment, 40 crossbred calves were either early weaned (89 days of age) or normal weaned (300 days of age). Early-weaned calves were kept on the ranch grazing perennial pastures and fed a commercial supplement at 1% of body weight (13.8% protein and 65% TDN on an as fed basis). At the time of normal weaning, all calves were shipped 746 miles to a North Carolina State University Research Feedlot.

In this study, similar to that observed in previously cited early weaning research in which calves were placed directly on a high-concentrate diet, early-weaned calves gained more efficiently in the feedlot than did normal weaned calves. However, no differences in carcass characteristics were noted between early-weaned and normal-weaned calves.

In this Florida trial, no calves became sick in the feedlot for either group (early-weaned or normal-weaned). However, there were differences in stress response, as measured by acute-phase protein concentrations (greater in normal-weaned calves) indicating that normal-weaned calves were stressed more. These data imply that early-weaned calves, which are maintained onsite before shipping may be more tolerant to the stressors associated with transportation and feedlot entry. Since the early-weaned calves had been weaned and exposed to feed for more than 200 days before transport to the feedlot, they were effectively preconditioned which may explain their improved feedlot performance and lower levels of stress indicators.

Salt Levels in Feedlot Diets

Salt (sodium chloride) is commonly supplemented in feedlot diets at levels of 0.25 to 0.5% of dietary dry matter. It is assumed that this salt addition improves intake and performance. The salt is added to the diet to meet sodium requirements. The 1996 Beef NRC suggest that the sodium requirement of growing and finishing cattle is 0.06 to 0.08% of dry matter. To meet this sodium requirement, salt needs to be fed at 0.15 to 0.20% of the diet. Higher levels of salt increase the level of sodium excretion in feces and urine which may cause long term problems in manure or compost applications and runoff application areas. Thus, in recent years several researchers have evaluated salt levels necessary to maximize intake and performance of feedlot cattle while minimizing sodium excretion to the environment.

In 2004, Nebraska researchers[8] evaluated feeding five different salt levels to feedlot heifers (0, 0.125, 0.25, 0.375 or 0.50%) fed a typical high-concentrate diet (85% corn). Dietary salt level had no effect on performance suggesting that salt inclusion in the diet is not necessary to maintain acceptable feedlot performance. Similar results were noted in recent Colorado research which evaluated feeding three salt levels to feedlot steers (0, 0.125, or 0.25%)[9] or two salt levels to feedlot steers and heifers (0.10 or 0.32%)[10]. Dietary salt level had no effect on cattle performance in either study. In other Colorado research[11], four dietary salt levels were fed to feedlot steers (0, 0.125, 0.25%, or free-choice salt block in the feed bunk). Total salt intake for the salt block treatment was approximately equal to cattle fed 0.25% supplemental salt. Performance was not affected by dietary salt level. However, the sodium level in manure samples pulled behind the feedbunk apron increased linearly as salt levels in the diet increased.

In summary, these recent feedlot trials suggest that salt inclusion in typical feedlot diets is not necessary to maintain acceptable feedlot performance. Reducing salt supplementation in feedlots would reduce the excretion of sodium to the environment and minimize sodium buildup on acres receiving manure and runoff water. However, higher levels of dietary salt are also added to feedlot diets to reduce urinary calculi based on the assumption that cattle would drink more water, which should increase urinary output. Oklahoma research[12] showed that water intake of feedlot heifers increased with added levels of dietary salt (water intakes of 9.6, 11.0, and 12.6 gal/day, respectively, with 0, 0.25 and 0.50% salt). Recent Nebraska research[13] looked at the effect of feeding no added salt versus 1% added salt to feedlot cattle during summer and winter feeding periods. Dietary salt level had no affect on performance. Feeding 1% salt tended to increase water intake during the winter trial but not during the summer trial.

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