BEEF CATTLE RESEARCH UPDATE

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Effect of Density of Steam Flaked Corn in Feedlot Rations Containing Wet Corn Gluten Feed

Steam flaking corn increases starch digestion and improves cattle performance. Research shows that decreasing the bulk density of steam-flaked corn (SFC) increases starch availability; however, as the degree of processing increases the use of natural gas and electricity increases which increases cost. Energy demand for flaking is inversely related to bulk density of flaked grain; lighter, more intensely processed flakes typically require longer steaming times and greater roll pressures which increase mill production cost. A 2007 survey of 29 consulting feedlot nutritionists reported that the average bulk density recommended for SFC was 27 lb/bushel; however, the most frequently recommended bulk density was 28 lb/bushel.[1]

Many feedlots in the Southern Great Plains use Cargill's Sweet Bran wet corn gluten feed as an energy and protein source, replacing part of the SFC and supplemental protein in growing and finishing diets. However, the effects of the bulk density of SFC in diets containing Sweet Bran is not well-defined Texas Tech University research determined the effects of three bulk densities of SFC in rations containing 25% Sweet Bran (dry matter basis) on the performance and carcass characteristics of feedlot steers.[2] The density treatments were 22, 26, or 30 lb/bushel SFC. This experiment used yearling steers (809 lb initial weight) fed an average of 163 days.

These researchers reported that the bulk density of SFC had no effect on overall performance of the cattle. Dressing percent and ribeye area increased linearly ($P \leq 0.05$) as SFC density increased, but other carcass traits were not affected by treatments. For a 5 day period before day 70 of the experiment, feed intake was measured and fecal samples were collected from each pen for measurement of nutrient digestibility. Intakes of dry matter (DM), organic matter (OM), and crude protein (CP) during this 5 day period did not differ among bulk densities; however, starch intake increased linearly ($P = 0.004$) as the density of SFC increased. Digestibilities of DM, OM, and CP tended ($P \leq 0.065$) to decrease linearly, and starch digestibility decreased ($P = 0.002$) linearly, as bulk density of SFC increased.

These authors concluded that the bulk density of SFC can be increased up to 30 lb/bushel in rations containing 25% Sweet Bran without affecting performance of finishing beef steers. However, the digestibility of starch might be negatively affected by increased bulk density.

Effects of Temperament and Acclimation to Handling on Reproductive Performance of *Bos taurus* Beef Females

Research has demonstrated that beef cows with excitable temperament have reduced pregnancy rates compared with cohorts with adequate temperament[3,4] and acclimation to human handling improves temperament and hastens puberty attainment in heifers.[5] However, this research only evaluated *Bos indicus*-influenced cattle: either Brahman crossbred cows[3] and heifers[5] or Nelore cows.[4] Thus, recent Oregon State University research evaluated the effects of temperament and acclimation to handling on reproductive performance of *Bos taurus* beef females.[6]

In one study, 433 lactating Angus x Hereford cows that had calved at least twice were evaluated for temperament before the breeding season. Cow temperament was assessed by chute score and exit velocity using a 5-point scale (1 = calm with no movement or slowest and 5 = violent and continuous struggle or fastest). Temperament score was calculated by averaging chute and exit scores. Cows were classified for temperament type according to temperament score (≤ 3 = adequate, > 3 = aggressive). These researchers reported that cows with aggressive temperament had reduced ($P \leq$

0.05) pregnancy (88.7 vs. 94.6%) and calving (85.0 vs. 91.8%) rates and tended to have reduced (P = 0.09) weaning rates (83.9 vs. 89.9%) compared with cows with adequate temperament. Thus, calf weaning weight per exposed cow tended to be reduced (P = 0.08) for aggressive cows compared with adequate cows (456 vs. 492 lb).

In another study, 88 Angus × Hereford heifers (average age = 206 days) were weighed (days 0 and 10) and evaluated for temperament score (day 10 only) in the same method as in Study 1. On day 11, the heifers were ranked by temperament score and body weight (BW) and were assigned to receive or not (control) an acclimation treatment. The acclimated heifers were processed through a handling facility 3 times (Mondays, Wednesdays, and Fridays) weekly for 4 weeks as follows:

- 1st week: Heifers were individually processed through the handling facility but were not restrained in the squeeze chute. They were then returned to pasture.
- 2nd week: Heifers were individually processed through the handling facility, restrained in the squeeze chute for approximately 5 seconds, and then returned to pasture.
- 3rd week: Heifers were similarly processed as in week 2 but were restrained in the squeeze chute for 30 seconds and then returned to pasture.
- 4th week: Heifers remained in the handling facility for 1 hour, were processed again through the handling facility, and then returned to pasture.

The total distance traveled by acclimated heifers during each of the acclimation events was approximately 0.37 miles (round-trip). During the acclimation period, the control heifers remained undisturbed on pasture. All heifers were assessed for temperament score on days 40 and 200.

These researchers reported that average daily gains did not differ between treatment groups. Acclimated heifers had reduced (P = 0.02) exit velocity on day 200 compared with control heifers. By day 200, 59.5% of the acclimated heifers had attained puberty (evaluated via plasma progesterone concentrations) compared to 37.8% of the control heifers (P < 0.01). However, no treatment effects were detected (P = 0.26) for pregnancy rates.

These researchers concluded that beef cows with aggressive temperament have impaired reproductive performance and overall productivity compared with cohorts with adequate temperament. Thus, they recommended that selection or culling criteria take into account cattle temperament. They also suggested that acclimation to human handling after weaning hastens reproductive development of replacement heifers. However, it was noted that previous research demonstrated that acclimation of mature cows to human interaction did not improve temperament and reproductive performance, and such a strategy may not be practical in range cow-calf production systems.[3]

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