BEEF CATTLE RESEARCH UPDATE

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Effect of Various Feeding Regimens Pre-Shipment on Shrink and Subsequent Weight Recovery in Feeder Calves

Shrink is a major factor in the marketing of feeder cattle, especially long haul cattle (20+ hours). Shrink occurs in two forms: 1) loss of body fill (usually lost in the first 50 to 100 miles of transit) and 2) loss of tissue fluids, which is observed during longer periods of transport. Auburn University research compared the effects of various pre-shipment feeding regimens on shrink and subsequent body weight (BW) gain in shipped and unshipped feeder calves.[1] In this study, 48 British cross steers (initial BW = 774 lb) were fed high moisture or dry feed for 45 days and then offered hay or no hay 48 hours before shipment. The steers were housed in 12 pens during the backgrounding period (3 pens/treatment and 4 steers/pen).

Daily gain during the backgrounding period did not differ ($P > 0.10$) between steers fed high moisture or dry feed (averaged 2.05 lb/day). On day 45, two steers from each pen were shipped, while their two pen-mates remained in the pen of origin. The shipped steers (average BW = 867 lb) were loaded on two trailers (12 steers/trailer; one from each pen) and remained on the trailers for 21 hours. After arrival, the shipped steers shrank 7.1% weighing significantly less ($P = 0.02$) than their non-shipped pen-mates (805 v. 864 lb). Neither high moisture nor dry feed or hay affected shrink ($P > 0.10$). Within 12 hour post-shipment, weights were similar for the shipped and un-shipped calves ($P = 0.08$; 818 and 864 lb, respectively). Pre-shipment diets or 48 hour hay offering did not affect BW post-shipment ($P > 0.10$). Within 5 days of shipment, BW of the transported calves (847 lb) and un-transported calves (867 lb) remained similar ($P = 0.36$).

Effects of Energy Supplementation Frequency and Forage Quality on Performance and Reproductive Responses of Replacement Beef Heifers

Reducing winter feed costs for beef cows is important to cow-calf producers since Standardized Performance Analysis records have shown that feed costs account for more than 60% of beef producers' annual cow cost with over one-half of these costs attributed to winter feeding.[2] The labor and transportation expenses associated with supplement feeding contribute significantly to the fixed cost of cattle operations. Therefore, feeding supplements on alternate days or three times weekly (eliminate Sunday feeding) instead of daily is a common strategy to decrease cost of production.

A 2000 research review of supplementation programs for beef cattle fed forage-based diets concluded that supplementing cattle with high protein supplements (cottonseed meal) three times or once weekly usually gives similar performance compared to daily feeding.[3] This same research review concluded that infrequent feeding (compared with daily feeding) of low-protein grain-based supplements usually reduces cattle performance probably due to disruption of ruminal function (due to starch) resulting in decreased forage intake and digestibility.

Recent University of Florida research compared the performance, physiological, and reproductive responses of replacements beef heifers consuming forages differing in nutritional quality and offered a low-starch energy supplement at two different frequencies.[4] Forty-eight Brahman X British heifers (initial weight = 531 lb and initial age = 294 days) were used in this 120 day study. The heifers were fed ad-libitum either low-quality hay (LQ: 8% crude protein, CP and 81% neutral detergent fiber, NDF on dry mater basis) or medium-quality hay (MQ: 12% CP and 74% NDF on dry matter basis) and supplemented either daily or 3 times weekly (Monday, Wednesday, and Friday). The supplement was based on soybean hulls and wheat middlings (contained 16% CP and 4.9% starch on dry mater basis) and was fed at weekly rates of approximately 35 and 17.5 lb/heifer (dry matter

basis) for LQ and MQ, respectively. These weekly feeding rates are equivalent to feeding either 5 or 2.5 lb of supplement daily for LQ and MQ, respectively. The heifers supplemented daily consumed the supplement within 1 hour and the heifers supplemented 3 times weekly consumed the supplement within 6 hours.

These researchers reported that heifers supplemented daily had similar daily gains compared with heifers supplemented 3 times weekly (0.60 vs. 0.55 lb/day). They also noted that daily supplementation reduced daily variation in hay intake, nutrient intake and blood plasma concentration of urea nitrogen, glucose, non-esterified fatty acids, and insulin-like growth factor. As a result, daily supplemented heifers attained puberty (Figure 1) and pregnancy (Figure 2) significantly sooner than heifers supplemented 3 times weekly. Thus, these authors concluded that replacement beef heifers receiving diets based on low-quality and medium-quality forages should receive low-starch energy supplements daily to enhance their reproductive development.

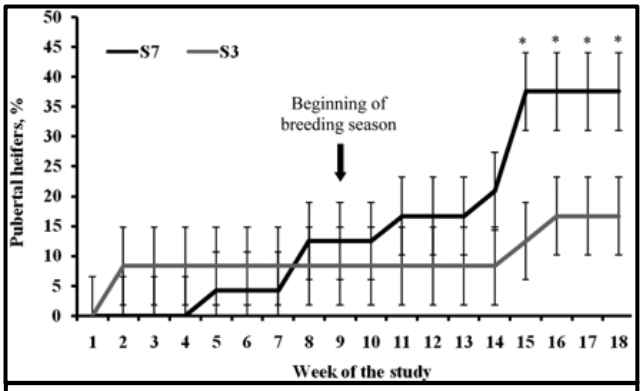

Figure 1. Puberty attainment of forage-fed replacement beef heifers offered a low-starch energy supplement daily (S7) or 3 times weekly (S3). Heifers were exposed to bull breeding (1:12 bull:heifer ratio) beginning on week 9 of the study. Source: Moriel et al., 2012.

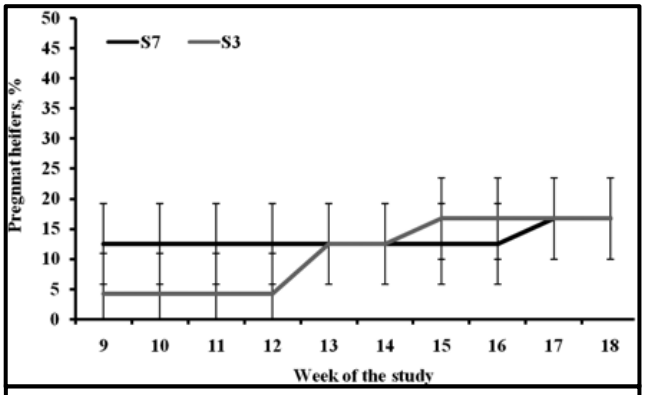

Figure 2. Pregnancy attainment of forage-fed replacement beef heifers offered a low-starch energy supplement daily (S7) or 3 times weekly (S3). Source: Moriel et al., 2012.

Other studies have also shown that feeding low-starch energy supplements 3 times weekly as compared to daily may have minimal effects on the performance (daily gains) of growing beef cattle.[5,6]. However, 2008 Florida data also suggested that daily feeding may enhance the nutritional and metabolic status of beef females fed low-quality forage resulting in improved reproductive performance and efficiency.[5]

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[1] Starnes, J. and D. Rankins. 2012. Effect of various feeding regimens pre-shipment on shrink and subsequent weight recovery in feeder calves. J. Anim. Sci. 90 (Suppl. 3):680 (Abstr.).

[2] Miller, A. J., D. B. Faulkner, R. K. Knipe, D. R. Strohbehn, D. F. Parrett, and L. L. Berger. 2001. Critical control points for profitability in the cow-calf enterprise. Prof. Anim. Sci. 17: 295-302.

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[4] Moriel, P., R. F. Cooke, D. W. Bohnert, J. M. B. Vendramini and J. D. Arthington. 2012. Effects of energy supplementation frequency and forage quality on performance, reproductive, and physiological responses of replacement beef heifers. J. Anim. Sci. 90:2371-2380.

[5] Cooke, R. F., J. D. Arthington, D. B. Araujo, G. C. Lamb, and A. D. Ealy. 2008. Effects of supplementation frequency on performance, reproductive, and metabolic respo0nses of Brahman-crossbred females. J. Anim. Sci. 86: 2296-2307.

[6] Drewnoski, M. E., M. H. Poore, and G. A. Benson. 2008. Frequency of supplementation with a mix of soyhulls and corn gluten feed does not affect performance of growing cattle fed a hay based diet. J. Anim. Sci. 86 (E-Suppl. 3): 24 (Abstr.).