



BEEF CATTLE RESEARCH UPDATE

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Effect of Diet (High Moisture vs. Dry) with and without Hay on Shrink in Feeder Cattle

Shrink is a major factor in the marketing of feeder cattle representing a cost to both the buyer and seller of cattle through lost body weight (BW). Shrink is especially important for long hauls (20+ hours). Research has suggested that cattle will lose approximately 1% BW/hour for the first 3 to 4 hours of shipment.¹ Shrink occurs in two forms: 1) loss of body fill and 2) loss of tissue fluids. Most fill is usually lost in the first 50 to 100 miles of transit. Tissue shrink is observed during longer periods of transport and is generally much more variable and slower than fill shrink (as low as 0.1% BW/hour after 10 hours or more). Tissue shrink is a decrease in the weight of the carcass and other body tissues primarily the result of extra-cellular and intra-cellular fluid loss. Fill shrink is recovered in a fairly short period of time after feed and water intake returns to normal, whereas tissue shrink can take days up to weeks to recover.

Auburn University research evaluated the effects of a high-moisture diet or dry feed with or without a hay offering 48 hours before shipment on the shrink and subsequent weight recovery in feeder calves subject to transport in two backgrounding trials.² In both trials, beef calves (774 and 655 lb initial weight in trial 1 and 2, respectively) were fed either a high moisture diet (44.4% dry matter, corn silage based) or a dry diet (91% dry matter) for 45 days in trial 1 and 49 days in trial 2 (6 pens/diet in each trial). In both trials, bermudagrass hay was offered to half of the pens (23.6 lb/head) on each diet 48 hours before a 21 hour transport period. On day 45 (trial 1) or day 49 (trial 2), half of the calves in a pen were shipped and half of the calves remained in their respective pen of origin. Following the 21 hour transport period, calves were returned to their pen of origin. In trial 1, the calves were weighed before shipment, immediately upon arrival, 30 hours after transport, and at 24 hour increments throughout the following 6 days. In trial 2, the calves were weighed before shipment, immediately upon arrival, 30 hours after transport, twice daily for the following 7 days, and on days 11 and 15 after transport.

These researchers reported that that shipped calves shrank 7.1 and 8.4%, respectively in trials 1 and 2 and remained lighter throughout the recovery periods ($P < 0.01$). Neither diet nor hay offering significantly affected shrink in either trial. Diet or hay offering had no effect on post-shipment BW recovery in trial 1. However, in trial 2 post-shipment BW recovery was faster for pens that received hay 48 hours before shipping. ($P < 0.05$). This data also revealed that there is a wide range in individual variation with shrink and subsequent weight recovery in feeder calves. The authors concluded that offering hay 48 hours before shipment did not affect shrink but did improve post transport BW recovery in trial 2 and tended to improve BW recovery in trial 1.

Effect of Stacking Technologies on Stocker Cattle Performance

Research conducted by the Noble Foundation in Ardmore, OK evaluated additivity of proven technologies (ionophores and implants) when they are used simultaneously. In this study, 90 steers (initial weight = 542 lb) were either not implanted or implanted with a trenbolone acetate-estradiol with tylosin implant (Component[®] TE-G with Tylan[®], Elanco Animal Health).³ The steers grazed cereal rye pastures for 84 days and were supplemented with either white salt blocks, non-medicated mineral blocks or medicated mineral blocks containing monensin (400 mg/lb, Rumensin[®]; Elanco Animal Health). Monensin is labeled by FDA to increase weight gain in pasture cattle when fed at a level of 50 to 200 mg per head per day.

These researchers reported that implanting significantly increased ($P = 0.001$) average daily gain (ADG) by 22.3% (2.54 vs. 2.07 lb/day). Steers fed the monensin block gained 17.7% faster than

steers fed salt only (2.49 vs. 2.12 lb/day; $P = 0.02$) Gains for steers fed the non-medicated mineral blocks were intermediate (2.32 lb/day). Daily intake of the various blocks averaged 0.09, 0.185, and 0.234 lb per steer for white salt blocks, medicated mineral blocks, and non-medicated mineral blocks, respectively. This intake of the medicated block provided 74 mg of monensin per day. There was no interaction between monensin supplementation and implant ($P = 0.13$), indicating that the effect of these technologies are additive in nature.

Using 2012 retail costs for the products and \$1/lb value of gain, these authors calculated that using both implants and the monensin mineral block increased expected net returns by approximately \$60 per steer. This response is similar to that reported in a 2012 University of Arkansas study that evaluated the use of Component[®] TE-G with Tylan implants and the feeding of monensin (either in loose mineral mix or a protein block) in wheat pasture steers.⁴ In this Arkansas study, implanting increased net returns per steer by \$62 and monensin supplementation increases net return per steer by \$26 when supplied by blocks or \$52 when supplied by mineral.

¹ Coffey, K. P., W. K. Coblenz, J. B. Humphrey, and F. K. Brazle. 2001. Review: Basic principles and economics of transportation shrink in beef cattle. *Prof. Anim. Sci.* 17:247-255.

² Starnes, J. R., D. L. Rankins, and W. F. Owsley. 2013. Evaluation of high moisture and dry feed with and without hay fed to feeder calves subjected to transportation shrink. *Prof. Anim. Sci.* 29:546-551.

³ Reuter, R., D. Dhuyvetter, and D. Hufstedler. 2013. Additivity of stacked technologies in stocker cattle. *J. Anim. Sci.* 71 (E-Suppl. 1):16.

⁴ Beck, P., T. Hess, D. Hubbell, B. Fieser, and D. Hufstedler. 2012. Effect of Rumensin[®] supplied via mineral or pressed protein block with or without Component TE-G with Tylan[®] implants on performance of steers grazing wheat pasture. Arkansas Animal Science Department Report Research Series 606:15-17. Available: <http://arkansasagnews.uark.edu/606-2.pdf>.