# BEEF CATTLE RESEARCH UPDATE

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**Effects of Time of Transporting Prior to Sale Data on Selling Weight of Weaned Steer Calves**

Many factors such as diet, age, weaning status, and pen conditions can affect sale weight. Recent University of Nebraska research used 88 weaned steer calves to evaluate the effect of time of transporting prior to sale date on sale weight of these calves.[1] Two groups of caves were transported 24 hours prior to the sale date, with one of these groups being withheld from hay and water two hours prior to the sale (+1-R) while the other group was allowed ad libitum access to hay and water (+1-Adlib). A third group was transported 2 hours prior to the sale (Control). All cattle were transported 95 miles and co-mingled at the sale facility prior to processing. The percent shrink for these three groups was 2.2, 1.8, and 0.6% for +1-R, +1-Adlib, and Control, respectively. These researchers had hypothesized that calves shipped one day prior to the sale would gain back the weight lost in the shipping process. However, in this study, calves shipped 24 hours prior to the sale continued to shrink in the new environment.

**Finishing Steers on Pasture with Varied Level of Corn Supplementation**

A 2006 Auburn University study determined the consumer acceptance of forage- and grain-finished beef in three southeastern states (Kentucky, Tennessee, and Alabama).[2] In this study, ribeye steaks (14 days of aging) from steers finished on forage (ryegrass) or a 92.5% concentrate, corn based diet were evaluated by 1250 consumers in a retail study and 87 consumers in a take-home study. These researchers reported that 34.1% of the retail consumers and 54.0% of the take-home consumers preferred steaks from the forage-finished beef.

Since some consumers prefer forage-finished beef, 2009 Auburn University research determined the effect of adding different amounts of grain to pasture diets on carcass traits, palatability traits, and forage utilization.[3] In this study, 72 fall-weaned crossbred steers were fed a forage based ration for about 90 days and then allotted to one of six finishing treatments consisting of ryegrass pasture with whole shelled corn supplemented at 0.0, 0.5, 1.0, 1.5, or 2.0% of body weight (BW) on an as fed basis; or an ad libitum fed an 85% concentrate, whole shelled corn based diet in drylot. At the beginning of the finishing period, the steers ranged in age from 10 to 13 months and weighed 704 lb. The steers were fed to an estimated 0.25 inch backfat thickness. This endpoint was determined from previous experience finishing half-siblings to these research cattle at the same research unit using the same forage in which finishing on ryegrass alone allowed deposition of 0.24 to 0.25 inches of fat before the forage was unable to continue to produce animal growth.

The performance, carcass, and palatability traits that were influenced by grain supplementation are shown in Table 1. These researchers reported that increasing the amount of grain in the diet resulted in a linear decrease ($P = 0.001$) in days on feed, but a linear increase ($P < 0.04$) in daily gain, dressing percentage, hot carcass weight (HCW), and USDA yield grade. Marbling tended to linearly increase ($P = 0.12$) with increasing grain supplementation. All of the treatment groups graded USDA Select. The researchers suggested that this may have occurred because the relative degree of finishing (0.25 inches backfat) is about half of that commonly found in feedlot steers (0.4 to 0.5 inches).

A trained sensory panel evaluated ribeye steaks for juiciness, tenderness, flavor intensity, and beef favor on a scale of 1 to 8 where 1 = extremely dry, tough, bland, and uncharacteristic of beef, and 8 = extremely juicy, tender, intense, and characteristic of beef, respectively. Warner-Bratzler shear force (WBS, measure of tenderness) was not affect by grain supplementation. Juiciness scores and sustained tenderness scores showed a quadratic response ($P < 0.05$) to diets with the greatest

juiciness values being found in meat from steers that had received the least or the most grain in their diets compared with those with moderate levels (1.0 and 1.5% BW grain). The researchers had no explanation for this response. Flavor intensity and beef flavor had a linear increase ($P < 0.001$) in scores as the amount of grain in the diet increased. All palatability scores were greatest for grain-fed beef. In addition, fat and protein contents of the steaks increased linearly ($P \leq 0.05$) with increasing amounts of grain in the diet (data not shown).

Table 1. Performance, carcass, and sensory panel traits of steers[1].

| | Corn Supplementation, % of BW | | | | | | P-value | |
|---|---|---|---|---|---|---|---|---|
| Item | 0.0 | 0.5 | 1.0 | 1.5 | 2.0 | Grain | Linear | Quad |
| Days on feed | 172 | 169 | 158 | 143 | 155 | 151 | 0.001 | 0.001 |
| ADG, lb/day | 2.29 | 2.09 | 2.56 | 2.80 | 2.56 | 2.65 | 0.002 | 0.24 |
| Dress, % | 56.3 | 57.3 | 58.6 | 58.6 | 60.6 | 60.1 | 0.001 | 0.32 |
| HCW, lb | 617 | 606 | 639 | 662 | 662 | 655 | 0.037 | 0.58 |
| Marbling[2] | 339 | 318 | 303 | 360 | 339 | 369 | 0.12 | 0.21 |
| Yield Grade | 2.11 | 2.08 | 1.94 | 2.40 | 2.34 | 2.54 | 0.022 | 0.36 |
| WBS, lb | 9.7 | 8.6 | 9.9 | 7.3 | 8.8 | 9.0 | 0.51 | 0.35 |
| Sensory Panel Traits | | | | | | | | |
| Initial juiciness[3] | 5.8 | 5.6 | 5.3 | 5.5 | 5.4 | 5.9 | 0.91 | 0.009 |
| Sustained juiciness[3] | 5.5 | 5.2 | 5.1 | 5.2 | 5.2 | 5.6 | 0.74 | 0.04 |
| Initial tenderness[4] | 5.6 | 5.9 | 5.4 | 6.0 | 5.9 | 6.2 | 0.33 | 0.14 |
| Sustained tenderness[4] | 5.6 | 5.5 | 4.9 | 5.7 | 5.6 | 6.0 | 0.12 | 0.02 |
| Flavor intensity[5] | 5.7 | 5.6 | 5.6 | 5.7 | 5.9 | 6.0 | 0.006 | 0.17 |
| Beef flavor[6] | 5.1 | 5.3 | 5.2 | 5.4 | 5.4 | 5.8 | 0.001 | 0.31 |

[1]Diets consisted of ryegrass pasture plus corn supplemented at 0.0, 0.5, 1.0, 1.5, or 2.0% of BW, or ad libitum concentrate diet in drylot (Grain).
[2]Marbling score (300 = slight[00], 400 = small[00])
[3]Scored on an 8-point scale (5 = slightly juicy, 6 = moderately juicy).
[4]Scored on an 8-point scale (5 = slightly tender, 6 = moderately tender).
[5]Scored on an 8-point scale (5 = slightly intense, 6 = moderately intense).
[6]Scored on an 8-point scale (5 = slightly characteristic, 6 = moderately characteristic).
Adapted from Roberts et al., 2009

During this trial, forage quality and availability (mass) was determined monthly. It was reported that increased grain supplementation resulted in greater amounts of forage mass availability. These researchers noted that these results were expected because corn supplementation would likely decrease forage consumption.

These researchers concluded that because of the increased forage availability, stocking density can be significantly increased by supplementing steers with corn, resulting in greater gains and reduced time on feed without affecting quality grade. Increasing the amount of grain in the finishing diet of forage-finished beef improves the intensity and quality of beef flavor, but has no significant effect on tenderness.

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[1] Kovarik, L. M., M. K. Luebbe, R. J. Rasby, and G. E. Erickson. 2010. Effects of time of transporting prior to sale date on selling weight of weaned steer calves. Nebraska Beef Cattle Report MP-93: 45-46.

[2] Cox, R. B., C. R. Kerth, J. G. Gentry, J. W. Prevatt, K. W. Braden, and W. R. Jones. 2006. Determining acceptance of domestic forage- or grain-finished beef by consumers from three southeastern U.S. States. J. Food Sci. 71: S542-S546.

[3] Roberts, S. D., C. R. Kerth, K. W. Braden, D. L. Rankins, Jr., L. Kriese-Anderson, and J. W. Prevatt. 2009. Finishing steers on winter annual ryegrass (*Lolium multiflorum* Lam.) with varied levels of corn supplementation I: Effects on animal performance, carcass traits, and forage quality J. Anim. Sci. 87: 2690-2699.