BEEF CATTLE RESEARCH UPDATE

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Carcass Characteristics of Grass or Grain Finished Steers

Recent University of California, Davis research compared carcass characteristics and profitability between grain- and grass-finished steers at a minimum level of fat development (USDA high-Select quality grade).[1] In this study, Angus steers (15 months of age with initial weight of 907 lbs) were finished on irrigated annual ryegrass and white clover pasture for 303 days or on an 80% cracked-corn diet for 168 days. None of the steers received growth promotants or ionophores. Ultrasound was used to determine the slaughter point for the steers.

These researchers reported that at slaughter, grain-finished steers weighed 57 lbs more, gained 75.6%faster, and were on feed 135 fewer days (Table 1) than grass-finished steers. In addition, grain-finished steers produced heavier carcasses (101 lbs heavier), higher dressing percentages (63.1 vs, 58.4%), and larger rib-eyes (Table 1) than grass-fed steers. Backfat thickness was similar between treatments. Tenderness fid not differ between treatments as measured by Warner-Bratzler shear force (P = 0.38). However, tenderness as measured by a taste panel was greater for grass-finished beef (P = 0.02). Taste-panel judges did not detect differences (P ≥ 0.14) in juiciness, flavor intensity, flavor quality, or overall palatability. Furthermore, there was no difference in shear force or cooking loss between steaks from grass- or grain-finished steers.

In an economic analysis, it was reported that a premium of at least 8% was necessary for the grass-finished cattle to obtain acceptable profits compared with grain-finished cattle when finishing at a minimum high-select quality grade. These authors also noted that the longer time required to finish cattle on grass has an effect on fixed costs and farm structure, which was not considered in the economic analysis. If this effect had been included in the calculations, profitability per steer for both treatments would have been reduced, but a greater reduction would have been expected for the grass-finished steers since they were on feed longer (135 days more).

These researchers concluded that this study demonstrates that finishing steers on grass at a minimum of high-Select can produce beef meat with similar meat and sensory characteristics as those of grain-finished steers. However, grain-finished cattle yielded more muscle and fat.

Table 1. Performance and carcass characteristics of grain- and grass-finished steers.

Item	Grain	Grass	P-value
Performance:			
Final weight, lb	1413	1356	<0.0001
Total weight gain, lb	498	459	0.1193
ADG, lb/day	2.95	1.68	<0.0001
Days on Feed	168	303	<0.0001
Carcass Characteristics:			
Hot carcass weight, lb	893	792	<0.0001
Dressing percent	63.1	58.4	<0.0001
Yield Grade	3.6	3.0	0.0044
Backfat, inches	0.51	0.39	0.3643
Rib-eye area, in^2	14.42	12.56	<0.0001

Adapted from Cruz et al., 2013.

Effect of Bale Feeder Type and Forage Quality on Hay Waste

Recent University of Missouri research used 48 beef cows to evaluate the effect of three bale feeder designs and two forage qualities on hay waste.[2] The three bale feeder designs were: open bottomed with 17 slanted feeding stations (Open: 7.9 ft. diameter and 3.9 ft. tall), solid bottomed with tapering sides and 15 slanted feeding stations (Solid: 6.9 ft. diameter at top, 7.9 ft. diameter at bottom, and 3.9 ft. tall with 20 in. of bottom sheeting), and solid bottom and top with 16 straight feeding stations and a chain cone (Cone: 7.5 ft. diameter, 5.6 ft. tall with 24 in. bottom sheeting and 20 in. top sheeting; see Figure 1). The two forage qualities evaluated were alfalfa haylage (high quality: HQ, 41% dry matter and 17% crude protein) and fescue hay (low quality: LQ, 92% dry matter and 7.5% crude protein).

These researchers reported that a significant interaction ($P < 0.05$) for percent bale waste was observed between forage quality and feeder design where LQ Open was greatest (19.2%), LQ Solid was intermediate (13.6%) but greater than LQ Cone (8.9%). However, LQ Cone waste was not different than HQ Open (7%) or HQ Cone (6.4%) but was greater than HQ Solid (4.9%). Hay waste was not significantly different for feeder design with high quality forage. These results suggest that cone feeders and solid bottom feeders are both effective at reducing waste of low quality forage.

Similar results were noted in Oklahoma State University research evaluating hay waste by beef cows using four different bale feeder designs.[3] In this study, hay waste was 21.5, 20.6, 12.7, and 5.6% with an open bottomed polyethylene pipe ring, an open bottomed steel ring, a sold bottomed steel ring, and a modified cone feeder (see Figure 1), respectively ($P < 0.01$). Both the Missouri and Oklahoma research indicate that feeder design can greatly impact hay waste. Hay waste is clearly greatest with open bottomed feeders with the least waste with cone-type feeders and intermediate with sold bottomed feeders.

Chain Cone Feeder: http://www.barnworld.com

Modified Cone Feeder

Figure 1. Pictures of cone-type feeders.

[1] Cruz, G. D., G. Acetoze, and H. A. Rossow. 2013. Case study: Carcass characteristics of Angus steers finished on grass or grain diets at similar quality grades. Prof. Anim. Sci. 29:298-306.

[2] Moore, W. A. and W. J. Sexten. 2013. Effect of bale feeder, forage, and monensin on hay waste, disappearance, and cow performance. J. Anim. Sci. 71 (E-Suppl. 2):702.

[3] Sparks, J. D., A. J. Sexten, C. P. McMurphy, G. L. Mourer, M. A. Brown, C. J. Richards, and D. L. Lalman. 2013. Effects of bale feeder type and supplementation of monensin on hay waste, intake, and performance of beef cattle. J. Anim. Sci. 71 (Suppl. 1):4.