



United States Department of Agriculture Agricultural Research Service

Impact of Cattle Genetics, Frame Size, and Pre-slaughter Diet on Productivity and Beef Quality

Grazinglands Research Laboratory, El Reno, Oklahoma

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Rationale: Local markets for farm-finished beef with a natural or organic label are growing. These systems often use higher proportions of forage and many seek to use only forage. Increased costs of feed grains have revived interest in increasing the use of forages and grazing in order to either market as forage-finished beef or to produce heavy calves that will finish on less grain. We will determine if frame score is a factor in carcass marbling, meat organoleptic characteristics, and economic outcomes in beef finished on all-forage systems.



Objective: Determine how cattle frame size and genetics impacts growth rate, carcass and beef quality, and economic returns under different finishing systems.

What We Are Doing: Following the winter stocker phase, steers and heifers produced by GRL-ARS-USDA are finished on either a conventional concentrate diet or grazed on alfalfa re-growth. Stocker-finish cattle types include small-medium (4.6 or less frame score) and medium-large frame Angus, and what would be considered a typical terminal cross animal produced from Angus X Brahman F1 cows bred to Charolais bulls (generally medium-large in frame size). Both finishing treatments began in mid-June, with concentrate cattle and the first slaughter group from alfalfa being killed after approximately 90 days of being on their respective finish diets. Another group of like cattle are carried approximately another 40 days (130 days total) on alfalfa prior to slaughter. Carcass data is collected at slaughter, and beef quality attributes were/are being evaluated in collaboration with Oklahoma State University.

Preliminary Results:

- Cattle on the concentrate diet achieved an ADG of 3.0 lb, while both alfalfa groups had ADGs of 2.25 lb.
 - Across finish treatments, S-M frame size cattle averaged 2.3 lb per day gain while M-L averaged 2.5 lb.
 - Hot carcass weights by finishing treatment were 674, 567, and 628 lb for concentrate, short, and long-fed alfalfa cattle, respectively.
 - Hot carcass weights by frame size were 581 and 637 lb for S-M and M-L cattle, respectively.
 - Frame size and finish diet did not impact Warner Bratzler tenderness scores, with all beef rated as tender.
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