

FEEDLOT AND CARCASS CHARACTERISTICS OF SEVERAL CATTLE TYPES SLAUGHTERED AT A CONSTANT QUALITY GRADE OF LOW CHOICE

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Story in Brief

Feedlot performance and carcass merit were compared among 173 steers from four breed type groups. The 3/4Exotic X 1/4British cross steers had the heaviest slaughter weight and required the most days on feed after weaning to reach low choice, while 1/2Exotic X 1/4British X 1/4Jersey steers reached low choice at the lightest weight and after the fewest days on feed. When examined at a constant endpoint of low choice, all four breed types had similar 12th rib fat thicknesses. Actual carcass cutability at low choice was highest for 3/4Exotic X 1/4British, moderate for 1/2Exotic X 1/2British and 1/2Exotic X 1/4British X 1/4Brown Swiss, and lowest for the 1/2Exotic X 1/4British X 1/4Jersey cross steers.

Introduction

It is important to determine the potential value of incorporating new breeds of cattle into commercial herds. Many new breeds, as well as breeds used primarily for milk production, have not been fully evaluated in a crossbreeding system, for feedlot and carcass performance. The purpose of this study was to compare breed type means for feedlot and carcass traits adjusted to a constant marbling score of Small (minimum marbling score required for US Low Choice). Low Choice is the major endpoint in the beef cattle feeding industry. Therefore, breed type comparisons made at this endpoint are directly applicable to present day industry concerns.

Experimental Procedure

A description of the data set used in this study can be found in the companion report "An Evaluation Of The USDA And Murphey Cutability Prediction Equations Among Several Cattle Breed Types."

There were four breed types of steers studied 1/2Exotic X 1/2British, 3/4Exotic X 1/4British, 1/2Exotic X 1/4British X 1/4Brown Swiss, and 1/2Exotic X 1/4British X 1/4Jersey. These steers were produced from mating Charolais and Limousin bulls to Hereford X Angus, Hereford X Simmental, Angus X Simmental, Hereford X Brown Swiss, Angus X Brown Swiss, Hereford X Jersey, and Angus X Jersey cross cows. All steers were placed directly into the feedlot after weaning, fed a 78% concentrate corn based finishing ration and slaughtered when they were subjectively estimated to have a carcass quality grade of

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low choice. These steers were randomly sampled from an extensive crossbreeding study designed to evaluate productivity of various two breed cross cows. Routine carcass traits, including marbling score and quality grade, were obtained 48 hours postmortem. The percent closely trimmed, boneless retail cuts from the round, loin, rib, and chuck (carcass cutability), the percent of total carcass lean (percent lean), the percent of trimmable carcass fat (percent carcass fat), and the percent of total carcass bone (percent bone) were determined using the left side of each carcass.

Means separation techniques were used to identify significant feedlot performance and carcass merit differences among breed type groups.

Results and Discussion

Feedlot Performance

The breed type means and standard errors of feedlot traits adjusted to a constant marbling score of Small (quality grade of low choice) are presented in table 1. The 3/4E X 1/4B breed type steers reached a carcass grade of low choice at a significantly heavier slaughter weight and subsequently spent more days in the feedlot after weaning. The 1/2E X 1/4B X 1/4J cattle had the lowest ADG and reached low choice at the lowest slaughter weight. The 1/2E X 1/2B steers were intermediate, reaching low choice at 1113 lb after gaining 2.5 per day for 261 days on feed.

Carcass Traits

Means and standard errors, adjusted to a marbling score of Small, for routine carcass measurements are presented in table 1. All breed types reached low choice at approximately the same 12th rib fat thickness (.41-.49in.). As expected the carcass weights followed the same breed type trend as slaughter weights. There was a trend for 1/4Jersey cattle to have the most kidney, heart, and pelvic fat (KHP=3.4%) and for the 3/4Exotic steers to have the least KHP (3.0) when slaughtered at a constant marbling score of Small.

Carcass Cutability

When steers were slaughtered at low choice, the mean percent bone was similar for all breed types. Conversely, there were breed type differences in carcass cutability and percent lean. At low choice, the 3/4E X 1/4B steers tended to have the highest carcass cutability and a significantly higher percent lean. The opposite was true for the 1/4Jersey cattle. Percent carcass fat measured at low choice was significantly lower for the 3/4Exotic steers, intermediate in the 1/4Brown Swiss and highest in the 1/2Exotic X 1/2British and 1/4 Jersey steers.

TABLE 1: Means and standard errors of feedlot traits and carcass measurements adjusted to a constant marbling score of Small (low choice).

BREED TYPE ^a	N	Slaughter weight lb	Average daily gain lb	Days on feed	Carcass weight lb	Fat thickness in	Rib eye area sq in	Kidney heart pelvic %
2E X 1/2E	44	1113 ^d (15.0)	2.5 ^b (.06)	261 ^{bc} (5.4)	713 ^d (10.9)	.49 ^b (.03)	13.1 ^c (.27)	3.2 ^{bc} (.13)
3/4E X 1/4B	31	1222 ^b (14.8)	2.6 ^b (.06)	279 ^b (5.3)	771 ^b (10.7)	.44 ^b (.03)	14.1 ^b (.26)	3.0 ^b (.13)
1/2E X 1/4E X 1/4BS	45	1173 ^c (13.5)	2.5 ^b (.05)	273 ^{bc} (4.9)	759 ^c (9.8)	.45 ^b (.02)	13.6 ^{bc} (.24)	3.3 ^{bc} (.12)
1/2E X 1/4E X 1/4J	53	1059 ^e (12.7)	2.2 ^c (.05)	249 ^c (4.6)	670 ^e (9.2)	.41 ^b (.02)	12.6 ^c (.23)	3.4 ^c (.11)

a - E = EXOTIC, B = BRITISH, BS = BROWN SWISS, J = JERSEY

numbers in parentheses are standard errors

means within same row with same superscript do not differ significantly

TABLE 2: Mean and standard errors for carcass composition traits for breed types at a constant marbling score of Small (low choice)

BREED TYPE ^a	ACT. CUT. ^b %	BONE %	LEAN %	FAT %	Lean:Bone ^f
1/2E X 1/2B	47.5 ^{de} (.55)	12.6 ^d (.002)	64.6 ^{de} (.005)	22.6 ^e (.005)	5.00 ^d (.08)
3/4E X 1/4B	48.9 ^d (.55)	12.9 ^d (.002)	66.3 ^d (.005)	20.4 ^d (.005)	5.06 ^d (.08)
1/2E X 1/4B X 1/4BS	48.0 ^{de} (.50)	12.8 ^d (.002)	65.0 ^{de} (.005)	21.9 ^e (.005)	5.00 ^d (.07)
1/2E X 1/4B X 1/4J	46.7 ^e (.47)	12.9 ^d (.002)	64.5 ^e (.005)	22.2 ^e (.005)	4.90 ^d (.07)

a - E=EXOTIC, B=BRITISH, BS=BROWN SWISS, J=JERSEY

b - ACT. CUT. = ACTUAL CUTABILITY

c - Lean:Bone = pounds of lean/pounds of bone

numbers in parentheses are standard errors

means within same row with same superscript do not differ significantly

Although carcasses, from the four breed type groups, had similar fat thicknesses they did not have the same actual carcass cutability, percent lean, and percent carcass fat. This would indicate that there are different relationships, for each breed type, between carcass measurements and actual cutability. Perhaps it also demonstrates breed differences in fat partitioning among depots (i.e. subcutaneous, seam fat, and kidney, heart, and pelvic fat).

The mean lean to bone ratio (lean:bone) for the four breed type groups were not significantly different when slaughtered at the low choice endpoint; however, the 1/4 Jersey cross steers tended to have the lowest lean:bone, indicating a muscularity disadvantage for this cattle type.

This study illustrates breed differences in feedlot performance and carcass merit. Exotic cattle demonstrated a greater carcass cutability at low choice than the other breed types; the 1/2E X 1/2B and the 1/2E X 1/4B X 1/4BS steers were intermediate in feedlot performance and carcass merit; and the 1/2E X 1/4B X 1/4J had the lowest average daily gain after weaning, as well as the lowest carcass cutability.