

FEEDLOT PERFORMANCE OF THREE-BREED CROSS CALVES PRODUCED BY VARIOUS TWO-BREED CROSS COW GROUPS

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Story in Brief

Over a seven year period, feedlot data were collected on 1,514 three-breed cross steers and heifers produced by Hereford X Angus (HA), Angus X Hereford (AH), Simmental X Angus (SA), Simmental X Hereford (SH), Brown Swiss X Angus (BA), Brown Swiss X Hereford (BH), Jersey X Angus (JA) and Jersey X Hereford (JH) cows mated to Charolais, Brahman, Limousin and Gelbvieh bulls. Calves entered the feedlot each year at weaning and were fed to an anticipated low choice carcass grade. Compared to calves from HA and AH cows (averaged 476 lb), initial weights were heavier for calves from S, B and J cross cows by 10, 12 and 5%, respectively. Compared to the average slaughter weight of calves from HA and AH cows (1102 lb), calves from S and B cross cows were 9% and 6% heavier, respectively, and calves from J cross cows averaged 4% lighter. For the entire feeding period, average daily gains for calves from HA, AH, S and B cross cows (averaged 2.53 lb/day) exceeded that of calves from J cross cows by 8%. Daily gains of calves from S cross cows exceeded gains of calves from HA cows by 4%. Calves from S cross, BH and HA cows were on feed an average of 261 days, followed by calves from BA, AH and JH (averaged 248 days) and JA (237 days). Compared to the average daily feed intake of calves from HA and AH cows (18.5 lb/day), calves from BA cows consumed 9% more and calves from S cross and BH cows consumed 5% more feed per day. Feed conversion favored calves from HA and AH cows (7.43 lb feed/lb gain) over calves from SA, BA and JH cows by an average of 5% and calves from JA cows by 7%.

(Keywords: Crossbreeding, Feedlot Performance, Angus, Hereford, Simmental, Brown Swiss, Jersey)

Introduction

This study is one of a series designed to evaluate and compare life-time productivity of two-breed cross cows when mated to bulls of a third breed. The preceeding paper characterized cow productivity and calf preweaning performance for these cows. Evaluation of cow breed types for use in commercial beef production should be based on a wide spectrum of important production traits. Thus, the objective of this study was to evaluate feedlot performance of three-breed cross calves from various two-breed cross cow groups when fed a finishing ration from weaning to a low choice carcass grade.

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Materials and Methods

Feedlot data were collected on 1,514 three-breed cross calves (771 heifers and 743 steers) over a seven year period. The calves were born in the spring (1976-1982) from Hereford X Angus (HA), Angus X Hereford (AH), Simmental X Angus (SA), Simmental X Hereford (SH), Brown Swiss X Angus (BA), Brown Swiss X Hereford (BH), Jersey X Angus (JA) and Jersey X Hereford (JH) cows mated to Charolais, Brahman, Limousin and Gelbvieh bulls. Only two sire breeds were used in a given year and they were randomly assigned to one-half of the cows in each crossbred cow group. Cow ages ranged from three to nine years.

Calves were reared with their dams on native tall grass and bermuda-grass pastures at the Lake Carl Blackwell Research Range west of Stillwater. Calves were born mostly during February and March and were weaned in October at an average age of 205 days. Immediately after weaning, calves were transported to feedlot facilities at the Southwestern Livestock & Forage Research Station near El Reno, OK.

Calves were fed ad libitum the diet shown in Table 1. Feed intake data were available for the last five years of the study when calves of a given three-breed cross and sex were fed together in a randomly assigned pen. Feed intake was measured on a pen basis. Feeding facilities consisted of two pole barns open to the south, each with 14 concrete floored pens. Each pen was 36 ft wide x 47 ft long with 21 ft of length under a roof. Because of the limited number of pens, contemporary calves from HA and AH reciprocal crosses were combined in a single pen.

Table 1. Composition of feedlot diet.

Ingredient	Percent in diet (as fed)	
	1976-78	1979-82
Corn	39	78
Milo	39	0
Ground alfalfa hay	8	8
Cottonseed hulls	4	4
Sugarcane molasses	5	5
Supplemental pellets ^a	5	5

^aSupplemental pellets consisted of 67.6% soybean meal, 12% urea, 10% calcium carbonate, 8% salt, plus Aurofac, Vitamin A and trace minerals.

Based on visual appraisal of finish and feeling degree of finish over the loin and ribs, and hands-on appraisal of finish, calves were individually removed from the feedlot for slaughter when an anticipated low choice carcass grade was attained. Cattle were weighed and appraised for finish and selected individuals sent to slaughter at two week intervals.

The actual weaning weight was used as the initial feedlot weight. A shrunk final weight was obtained on each animal prior to shipment for slaughter. Average daily gain was calculated separately for the first 120 days on test, after 120 days and for the overall feedlot test period. Final age was the age of the calf when the final live weight was obtained.

Results and Discussion

Weights, Gains, Final Age and Days on Feed

The intended target of slaughtering cattle at a low choice carcass was achieved quite well. On a scale of 9=high Good, 10=low Choice and 11=average Choice, the average carcass grade over all groups was 10.0. Average carcass grades for crossbred groups ranged from 9.8 to 10.1. Thus, the following comparisons concerning feedlot performance are made among crossbred groups fed to a similar carcass grade.

Least squares means are presented for these traits by crossbred cow group in Table 2. Initial weights of calves from HA and AH cows (averaged 476 lb) were exceeded by weights of calves from S, B and J cross cows by 49, 58 and 26 lb (10, 12 and 5%), respectively. Compared to the average final live weight of calves from HA and AH cows (averaged 1102 lb), calves from S and B cross cows were 101 lb (9 percent) and 67 lb (6%) heavier, respectively, and calves from J cross cows averaged 46 lb (4%) lighter. Calves from JH cows were 26 lb (3%) heavier at slaughter than calves from JA cows.

For the first 120 days on feed, daily gains were similar for calves from AH, SA and SH cows (averaged 2.80 lb/day), exceeding gains of calves from HA and J cross cows by .11 and .31 lb/day, respectively. Calves from HA and B cross cows (averaged 2.74 lb/day) gained .25 lb/day faster than calves from J crosses. After 120 days on feed, there was relatively less variation in daily gains among crossbred cow groups. Gains were similar for calves from HA, AH, S and B cross cows (averaged 2.31 lb/day) and exceeded gains of calves from JA cows by .19 lb/day. Calves from SA, SH and BH cows gained faster than calves from JH cows (2.34 vs 2.20 lb/day).

Over the entire feedlot period, daily gains of calves from HA, AH, S and B cross cows (averaged 2.53 lb/day) exceeded gains of calves from J cross cows by .19 lb/day (8%). Calves from S cross cows gained .09 lb/day (4%) faster than calves from HA cows. Relative to other crossbred cow groups, postweaning growth rates of calves from J cross cows were less than preweaning growth rates (Frahm and Marshall, 1985). This likely reflects the effects of high milk producing ability relative to mature size of the Jersey crosses (Belcher et al., 1979).

Averaged over all crossbred cow groups, calves were on feed 253 days and were slaughtered at 461 days of age. Calves from S cross, BH and HA cows were fed an average of 261 days, followed by calves from AH, BA and JH cows (averaged 248 days) and calves from JA cows (237 days). Calves from HA cows were 9 days older at slaughter than calves from AH cows. Compared to the average final age of calves from HA and AH cows (462 days), calves from S cross cows were 11 days older, calves from B cross cows were similar in age and calves from J cross cows were 13 days younger.

Feed Intake and Feed Conversion

Least squares means for feed intake and conversion are presented by crossbred cow group in Table 3. Compared to the daily feed intake of calves from HA and AH cows (18.5 lb/day), calves from BA cows consumed 1.7 lb/day (9%) more, calves from S cross and BH cows consumed 1.0 lb/day (5%) more and calves from J cross cows had similar intakes (18.2 lb/day). Compared to feed conversion of calves from HA and AH cows (7.43 lb feed/lb gain), calves from SA, BA and JH consumed .37 lb (5%)

Table 2. Least squares means for feedlot traits.

Crossbred cow group ^a	No. calves	Initial wt		Final wt		Average daily gain				Final age, days ^b	No. days fed
		lb	% HA,AH	lb	% HA,AH	1st 120 days	After 120 days	Overall			
						lb/day	lb/day	lb/day	% HA,AH		
HA	175	472 ^g	99.1	1105 ^e	100.3	2.69 ^d	2.27 ^{cd}	2.47 ^d	98.7	466 ^{de}	258 ^{cd}
AH	169	481 ^g	100.9	1098 ^e	99.7	2.78 ^c	2.29 ^{cd}	2.54 ^{cd}	101.3	457 ^f	249 ^{de}
SA	210	529 ^{cd}	111.1	1199 ^c	108.9	2.80 ^c	2.36 ^c	2.56 ^c	102.2	470 ^{cd}	263 ^c
SH	161	522 ^d	109.7	1206 ^c	109.5	2.82 ^c	2.34 ^c	2.56 ^c	102.2	475 ^c	265 ^c
BA	175	534 ^c	112.0	1171 ^d	106.3	2.78 ^{cd}	2.29 ^{cd}	2.51 ^{cd}	100.4	462 ^{ef}	250 ^{de}
BH	159	534 ^c	112.0	1166 ^d	105.9	2.76 ^{cd}	2.31 ^c	2.51 ^{cd}	100.4	463 ^{def}	259 ^{cd}
JA	236	498 ^e	104.6	1043 ^f	94.7	2.49 ^e	2.12 ^e	2.31 ^e	92.5	447 ^g	237 ^f
JH	229	507 ^e	106.5	1069 ^f	97.1	2.49 ^e	2.20 ^{de}	2.36 ^e	94.3	450 ^g	246 ^e
Overall	1514	509		1131		2.71	2.27	2.47		461	253

^aH=Hereford, A=Angus, S=Simmental, B=Brown Swiss and J=Jersey.

^bAverage age of cattle when removed from the feedlot for slaughter at an anticipated low choice carcass grade.

^{cdefg}Means in the same column not sharing a common superscript differ (P<.05).

more feed per lb gain and calves from JA cows consumed .54 lb (7%) more feed per lb gain. Calves from SH and BH were intermediate in feed conversion (averaged 7.63 lb feed/lb gain) and differed significantly ($P < .05$) from BA and JA. Excluding the HA and AH groups, calves from H cross cows consumed .16 lb (2%) less feed per lb gain than calves from A cross cows.

Table 3. Least squares means for feed intake and conversion.

Crossbred cow group ^a	No. pens	Daily feed intake		Feed/gain	
		lb/day	% HA,AH	lb/lb	% HA,AH
HA, AH	20	18.5 ^d	100.0	7.43 ^b	100.0
SA	20	19.7 ^{bc}	106.6	7.71 ^{cd}	103.8
SH	20	19.4 ^c	105.0	7.60 ^{bc}	102.3
BA	20	20.2 ^b	109.2	7.88 ^{de}	106.1
BH	20	19.4 ^c	104.8	7.65 ^{bc}	103.0
JA	20	18.2 ^d	98.4	7.97 ^e	107.3
JH	20	18.1 ^d	98.2	7.82 ^{cde}	105.2
Overall	140	19.1		7.72	

^aH=Hereford, A=Angus, S=Simmental, B=Brown Swiss and J=Jersey.

^{bcd}e Means in the same column not sharing a common superscript differ ($P < .05$).

Conclusions

Important differences exist among crossbred cow groups evaluated in this study with respect to calf feedlot performance. Relative to the other crossbred cow groups, postweaning growth rate of J cross calves was inferior to their preweaning growth, while the opposite was true for calves from HA and AH cows. This apparently reflects the effects of cow milk yield relative to potential calf mature size or growth rate. Calves from S and B cross cows performed well, both before and after weaning, with respect to growth rate.

Literature Cited

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