

Comparison of Feedlot Performance Among Various Two-Breed Cross Steers

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Story in Brief

Feedlot performances were compared among seven different two-breed cross steers involving a total of 142 steers. Half of the steers were placed in the feedlot at weaning and the other half grazed wheat pasture before being placed in the feedlot as yearlings. On the average, yearling fed steers were in the feedlot 32 fewer days, gained 0.15 lbs. per day more rapidly, but required 1.24 more lbs. of feed per lb. of gain than steers that were placed in the feedlot immediately after weaning. Simmental-Angus, Simmental-Hereford, Brown Swiss-Angus and Brown Swiss-Hereford steers on the average were on test 33 days longer than Angus-Hereford, Jersey-Angus and Jersey-Hereford steers and consequently were heavier at slaughter.

Feedlot ADG was similar for the Simmental crosses, Brown Swiss crosses and Hereford-Angus steers (2.76 lbs.) and were on the average 0.38 lbs. per day more rapid gaining than Jersey cross steers. Simmental-Hereford steers were most efficient (7.8 lb. of feed/lb. of gain); Simmental-Angus, Angus-Hereford and Brown Swiss-Hereford were second (8.2 lbs.); Jersey-Hereford and Brown Swiss-Angus were third (8.6 lbs.) and Jersey-Angus steers were least efficient (9.1 lbs.)

Introduction

Ample research has demonstrated that systematic crossbreeding systems can increase the pounds of calf weaned per cow in the breeding herd by at least 20 percent over straightbreeding systems. Information is needed however, as to which breeds can best be combined into systematic crossbreeding systems to maximize production efficiency under various production and management systems. An extensive research study is currently in progress to compare the lifetime productivity of various two-breed cross cows under Oklahoma range conditions when mated to bulls of a third breed. The present study compares feedlot performances of seven different crossbred steer groups under two different postweaning management regimes. Half of the steers from each group were placed in the feedlots at weaning time, whereas, the other half were grazed on

wheat pasture and placed in the feedlots as yearlings. These steers were produced in the process of obtaining the various two-breed cross females to be evaluated for the main objective of the study.

Materials and Methods

Angus cows were randomly mated to Hereford, Simmental, Brown Swiss and Jersey bulls and Hereford cows were randomly mated to Angus, Simmental, Brown Swiss and Jersey bulls to produce eight different two-breed cross calves. Four bulls from each sire breed were used in these matings. The two-breed cross calves were born at the Lake Carl Blackwell Research Range west of Stillwater during February, March and early April of 1973. The calves remained with their dams on native range without creep feed until they were weaned September 25, 1973 at an average age of 205 days. Growth performance to weaning was reported by Stanforth, Frahm and Sharp, 1974, Okla. Agr. Exp. Station Misc. Pub. 92:28.

A total of 150 crossbred steers were trucked to the Ft. Reno Livestock Research Station. The oldest half of the steers in each crossbred group (a total of 78 steers) were placed in the feedlot one week after weaning. The youngest steers in each crossbred group (a total of 72 steers) were grazed on wheat pasture and placed in the feedlot on March 7, 1974 at an average age of approximately one year.

Hereford x Angus and Angus x Hereford steers were mixed and treated as a single crossbred group for the finished phase. Steers from each of the seven crossbred groups were randomly divided into two feeding pens (a total of 14 feeding pens) and were fed on self feeders the ration shown in Table 1. A total of 8 steers were removed from the feeding trial because of urinary calculi in the case of those that were placed on test at weaning time. Corn was substituted for milo from day 174 till the

Table 1. Finishing Ration for Crossbred Steers.

| Ingredient | Percent in ration |
|-----------------------------------|----------------------|
| Milo ¹ | 78 |
| Alfalfa | 8 |
| Cottonseed Hulls | 4 |
| Molasses | 5 |
| Supplemental Pellets ² | 5 |
| | 100 |

¹ Corn replaced milo from day 174 through the end of the finishing period in the case of steers placed on test at weaning age because of a urinary calculi problem.

² Supplemental pellets consisted of 67.6% soybean oil meal (44%), 12% urea, 10% calcium carbonate, 8% salt plus aurofac, Vitamin A and trace minerals.

end of the finishing period in the weaning age group and no further urinary calculi problems occurred.

Each steer was evaluated individually and sent to slaughter at it was anticipated that he had sufficient finish to grade low choice.

Results and Discussion

Feedlot performances for steers placed on test at weaning time are presented in Table 2. Data for steers placed on test as yearlings are presented in Table 3. On the average steers that went on test as yearlings were 47 lbs. heavier in weight on test, gained 0.15 lbs. per day more in the feedlot, and were in the feedlot 32 fewer days. Average slaughter weights were similar for both test groups. Weight on test varies among crossbred groups because they were all placed on test on the same date at similar ages. Thus, differences in genetic potential for growth and differences in lactation level of dams resulted in different average weights at the start of the feeding period.

The Simmental cross steers and the Brown Swiss cross steers required the longest feeding period and thus had the heaviest slaughter weights. In the weaning group Simmental and Brown Swiss cross steers were on feed an average of 247 days and averaged 1129 lbs. at the time of slaughter. The Hereford-Angus steers and the Jersey crosses were on feed an average of 34 fewer days. Hereford-Angus steers weighed 1039 lbs. and Jersey crosses weighed 922 lbs. on the average. The same general pattern was found in the yearling test group. On the average the yearling steers were on feed 32 fewer days and the Brown Swiss and Simmental crosses were

Table 2. Feedlot Performance for Various Crossbred Steer Groups Placed on Test at Weaning Age.

| Crossbred group | No. Steers | Initial Wt. (lbs.) | Final Wt. (lbs.) | Days on feed | ADG | Carcass Wt. (lbs.) | Carcass grade |
|-------------------------------|------------|--------------------|-------------------|------------------|---------------------|--------------------|---------------------|
| Angus x Hereford ¹ | 16 | 469 ^{4,5} | 1039 ² | 217 ¹ | 2.64 ^{3,4} | 634 ² | 10.7 ² |
| Simmental x Angus | 9 | 534 ² | 1180 ³ | 236 ¹ | 2.76 ² | 723 ² | 9.9 ¹ |
| Simmental x Hereford | 10 | 450 ^{4,5} | 1117 ⁴ | 251 ² | 2.68 ^{3,4} | 671 ⁴ | 9.7 ¹ |
| Brown Swiss x Angus | 13 | 475 ⁴ | 1116 ⁴ | 251 ² | 2.56 ^{3,4} | 679 ⁴ | 9.7 ⁴ |
| Brown Swiss x Hereford | 8 | 436 ^{5,6} | 1104 ³ | 251 ² | 2.68 ^{3,4} | 676 ⁴ | 9.9 ¹ |
| Jersey x Angus | 9 | 454 ^{4,5} | 938 ² | 206 ¹ | 2.37 ⁴ | 557 ² | 9.1 ⁴ |
| Jersey x Hereford | 5 | 408 ³ | 906 ² | 215 ⁴ | 2.33 ⁴ | 545 ² | 10.0 ^{2,4} |
| Avg. all groups | 70 | 461 | 1057 | 232 | 2.57 | 641 | 9.9 |

¹ Includes both A x H and H x A crosses.

² Carcass quality grade equivalents: 11=choice, 10=choice-, 9=good-1⁺

^{2,4,5,6} Means in the same column that do not have at least one superscript in common are significantly different at the 0.05 probability level.

Table 3. Feedlot Performance for Various Crossbred Steer Groups Placed on Test at Yearling Age.

| Crossbred group | No. Steers | Initial Wt. (lbs.) | Final Wt. (lbs.) | Days on feed | ADG | Carcass Wt. (lbs.) | Carcass Grade |
|-------------------------------|------------|----------------------|---------------------|--------------------|-------------------|--------------------|----------------------|
| Angus x Hereford ¹ | 16 | 532 ^a | 1051 ^b | 184 ⁷ | 2.85 ^b | 636 ⁴ | 9.8 ³⁺⁴⁺⁵ |
| Simmental x Angus | 11 | 532 ^b | 1120 ³⁺⁴ | 200 ⁶⁺⁷ | 2.98 ^b | 688 ³ | 9.9 ³⁺⁴⁺⁵ |
| Simmental x Hereford | 10 | 515 ³⁺⁴ | 1131 ³ | 209 ⁴⁺⁵ | 2.97 ^b | 691 ³ | 9.6 ⁴⁺⁵ |
| Brown Swiss x Angus | 12 | 518 ³⁺⁴ | 1100 ³⁺⁴ | 217 ³⁺⁴ | 2.70 ^b | 679 ³ | 10.4 ³ |
| Brown Swiss x Hereford | 10 | 474 ⁵ | 1083 ⁴⁺⁵ | 224 ³ | 2.74 ^b | 676 ³ | 10.2 ³⁺⁴ |
| Jersey x Angus | 7 | 487 ⁴⁺⁵ | 914 ⁵ | 187 ⁶⁺⁷ | 2.31 ⁴ | 533 ⁵ | 9.4 ⁵ |
| Jersey x Hereford | 6 | 499 ³⁺⁴⁺⁵ | 940 ⁵ | 179 ⁷ | 2.47 ⁴ | 553 ⁵ | 9.2 ⁵ |
| Avg. all groups | 72 | 508 | 1048 | 200 | 2.72 | 637 | 9.8 |

¹ Includes both A x H and H x A crosses.

² Carcass quality grade equivalents: 11=choice, 10=choice-, 9=good+1-.

³⁺⁴⁺⁵⁺⁶⁺⁷ Means in the same column that do not have at least one superscript in common are significantly different at the 0.05 probability level.

about 21 lbs. lighter at slaughter than their counterparts in the weaning test group.

Average daily gain during the feeding period was very similar for the Simmental crosses, Brown Swiss crosses and Hereford-Angus steers averaging 2.66 lbs. per day in the weaning steers and 2.85 lbs. per day in the yearling steers. The Jersey cross steers gained about 0.38 lbs. per day less than the other groups.

Differences in carcass weight are primarily due to differences in slaughter weight. Dressing percent was similar among all groups over both test periods ranging from 58.2 percent to 61.8 percent.

Differences in carcass grade were not large because of the experimental design to slaughter all steers as they reached the low choice grade. In the weaning steers the desired average grade was attained only in the Angus-Hereford and Jersey-Hereford steers. The Simmental and Brown Swiss cross steers were in the very top part of the high good grade. Apparently additional time in the feedlot would be necessary to get these kinds of steers to the higher grade. The Jersey-Angus steers failed to grade low choice because of conformation, not lack of marbling. In the yearling steers, the Hereford-Angus, Simmental-Angus and Simmental-Hereford steers were apparently sent to slaughter a few days too soon. Lack of adequate conformation was the factor that prevented the Jersey cross steers from grading higher.

Feed efficiencies for each crossbred group in both test periods are presented in Table 4. Although there were some fairly large differences in feed efficiency, few of the differences among crossbred groups within a

Table 4. Feed Efficiency for Various Crossbred Steer Groups.

| Crossbred Group | On Test at Weaning Age | | On Test at Yearling Age | | Avg. Both Test Periods |
|-------------------------------|------------------------|-------------------------|-------------------------|-------------------------|------------------------|
| | No. Steers | lbs. feed/ lbs. gain | No. Steers | lbs. feed/ lbs. gain | |
| Angus x Hereford ¹ | 16 | 7.48 | 16 | 8.81 ² | 8.14 ^{2,3} |
| Simmental x Angus | 12 | 7.82 | 11 | 8.47 ² | 8.14 ^{2,3} |
| Simmental x Hereford | 10 | 7.26 | 10 | 8.36 ² | 7.81 ² |
| Brown Swiss x Angus | 13 | 8.09 | 12 | 9.29 ^{2,3} | 8.69 ^{2,3} |
| Brown Swiss x Hereford | 11 | 7.86 | 10 | 8.52 ² | 8.19 ^{2,3} |
| Jersey x Angus | 9 | 8.03 | 7 | 10.24 ³ | 9.13 ⁴ |
| Jersey x Hereford | 7 | 7.78 | 6 | 9.34 ^{2,3} | 8.56 ^{2,4} |
| Avg. all groups | 78 | 7.76 | 72 | 9.00 | 8.38 |

¹ Includes both A x H and H x A crosses.

^{2-2,4} Means in the same column that do not have at least one superscript in common are significantly different at the 0.05 probability level.

test period were statistically significant. Averaged over both test periods, Simmental-Mereford steers were the most efficient at 7.81 lbs. of feed per lb. of gain. Simmental-Angus, Angus-Hereford and Brown Swiss-Simmental-Hereford steers were the most efficient at 7.81 lbs. of feed per lb. of gain. Simmental-Angus, Angus-Hereford and Brown Swiss-Hereford were quite similar and required 0.35 more lbs. of feed per lb. of gain than Simmental-Hereford. Compared to Simmental-Hereford steers, Jersey-Hereford and Brown Swiss-Angus steers required 0.82 more lbs. feed per lb. of gain. Jersey-Angus steers were the least efficient and required 9.13 lbs. of feed per lb. of gain on the average. The Hereford cross steers were consistently slightly more efficient than their Angus cross counterparts. (Simmental-Hereford vs. Simmental-Angus, etc.)

Although the yearling fed steers were on test 32 fewer days and gained 0.15 lbs. per day more rapidly, they required 1.24 more lbs. of feed per lb. of gain than the steers started on test at weaning time.