

animal performance is open to question and further investigations should be conducted in this area.

The acid level of high moisture corn stored in the whole form indicate that the fermentation process is considerably slower. Technical difficulties involved in storing whole corn in a pit silo tend to indicate that a chemical preservation might be necessary to prevent spoilage.

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## Feedlot Performance and Carcass Merit of Calves From Hereford, Hereford x Holstein and Holstein Cows

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### Story in Brief

Calves out of Hereford cows required the shortest feeding period, gained most rapidly and most efficiently, followed by calves out of Crossbreds.

Calves out of Hereford cows produced carcasses with more muscling, as indicated by more ribeye area per cut. carcass, and a higher conformation grade, while calves out of Holsteins produced heavier carcasses with less external and internal fat and produced more carcass weight per day of age. Calves out of Crossbreds and Holsteins were similar in marbling and carcass grade, and slightly superior to Herefords in these traits.

Calves out of Hereford cows were most profitable in the feedlot; calves out of Crossbred and Holstein cows were similar in profitability. Based on carcass value less feeding costs, calves out of Hereford cows had the highest value at weaning, followed by calves out of Crossbreds and Holsteins.

In cooperation with USDA, Agricultural Research Service, Southern Region.

## Introduction

The cow-calf operator trying to obtain the highest possible return per dollar invested is interested in increasing the weaning weight of his calves. Research has shown a strong positive relationship between level of milk production in beef cows and weaning weight of their calves. Selection of heifer calves higher in weaning weights will result in higher milk production, but a faster method of increasing milk production in the cow herd is to infuse dairy breeding. The resulting increase in milk production should increase weaning weight, but in order to fully evaluate this practice, the feedlot performance and carcass characteristics of calves with a percentage of dairy breeding should be determined.

The primary purpose of this phase of the experiment was to compare the feedlot performances and carcass characteristics of calves out of Hereford, Hereford x Holstein crossbred and Holstein females.

The first calves produced in this experiment, sired by Angus bulls, were fed and slaughtered; results were reported in the 1973 Animal Sciences and Industry Research Report (MP-90:107). Calves out of Hereford cows tended to gain the fastest and those out of Holstein cows the slowest. Calves out of Holstein cows were least efficient. Calves out of Holstein cows required the longest feeding period and were heaviest at slaughter, followed by calves out of the crossbreds. Calves out of Holstein cows had an advantage in dressing percent, marbling, carcass grade and tenderness.

This report summarizes feedlot performance and carcass merit of the second calf crop produced in the experiment.

## Experimental Procedure

Calves used in this study were sired by Charolais bulls and out of Hereford, Hereford x Holstein and Holstein females calving for the second time. These calves were dropped from late November, 1971 through February, 1972. At calving their dams within each breed were assigned to one of two (Hereford and Hereford x Holstein) or three (Holstein) levels of winter supplementation designated as Moderate, High or Very High. Daily post-calving amounts of a 30 percent protein supplement consisted of approximately 3.1, 6.3 and 9.2 lb. for Moderate, High and Very High treatments, respectively. The experimental design is illustrated in the heading of Table 1.

The calves were placed in the feedlot at weaning which was at  $240 \pm 7$  days. Their weaning weight, taken after a 12-hour shrink, was used as the initial feedlot weight. The calves were fed an 80 percent concentrate ration containing 65 percent milo, 10 percent wheat, 10 percent

**Table 1. Feedlot Performance of Calves Out of Three-Year-Old Cows**

Item	Breed of dam		
	Hereford	Hereford x Holstein	Holstein
No. of head	24	19	19
Initial weight <sup>1</sup> , lb.	570	592	715
Slaughter weight, lb.	990	1047	1177
Age at slaughter <sup>2</sup> , days	427	447	471
Average days fed, days	187	207	231
Average daily gain, lb.	2.24	2.11	2.02
Feed/lb. gain, lb.	10.04	10.80	12.99

<sup>1</sup> Actual weaning weight.

<sup>2</sup> 240 days + average days fed.

alfalfa, 7.5 percent soybean meal, 1.0 percent urea, 5.0 percent molasses and 1.0 percent salt and minerals. Vitamin A was also added at recommended levels. Calves were vaccinated upon entry into the feedlot for blackleg, PI-3 and IBR. Calves were group fed, by sex and by dams' breed and supplement level.

Cattle were slaughtered as each steer or heifer reached an anticipated grade of choice based on apparent fatness. Slaughter weight was based on an overnight 12-hour shrink. Animals were slaughtered at a federally inspected commercial packing plant. After slaughter, all carcasses were chilled for 24 hours after which time a USDA grader estimated quality grade, marbling score, maturity, confirmation score and kidney, heart and pelvic fat. A tracing was made at the 12th-13th rib separation on each carcass to determine ribeye area and backfat thickness. Cutability was calculated using the Murphy cutability prediction equation.

Shear values were determined on two-inch rib steaks removed at the 12th rib. The steaks were cooked to an internal temperature of 150°F. After 24 hours of chilling, three cores were taken from each steak and each core was subjected to three shear tests.

## Results and Discussion

Feedlot performance and carcass merit were generally not affected by level of supplement received by the dam. Consequently, results are shown only by breed of dam, in Table 1 for feedlot performance and Table 2 for carcass merit.

Results were similar to those observed the previous year. Calves out of Hereford cows required the shortest feeding period, gained most rapid-

ly and most efficiently, followed by calves out of Crossbreds. The poor gains and feed efficiencies were due to severe winter weather; calves were fed outside in dirt lots and muddy conditions prevailed during much of the feeding period.

Carcass merit is summarized in Table 2. Calves out of Hereford cows produced carcasses with more muscling, as indicated by more ribeye area per cwt. carcass, and a higher conformation grade, while calves out of Holsteins produced heavier carcass with less external and internal fat and produced more carcass weight per day of age. Calves out of Crossbreds and Holsteins were similar in marbling and carcass grade, and slightly superior to Herefords in these traits.

An economic analysis based on prices at the time of the feeding trial showed a feedlot profit of \$12, \$4 and \$5 for calves out of Hereford, Crossbred and Holstein cows, respectively.

Another type of economic analysis was made in which feed, yardage and interest cost were subtracted from the value of the carcass, and the resulting return was divided by the initial weight of the calf to provide an estimate of the value of the calves for feeding. These calculations showed a value of \$43, \$40 and \$38/cwt. for calves out of Hereford, Crossbred and Holstein cows, respectively.

Table 2. Carcass Merit of Calves Out of Three-Year-Old Cows

Item	Breed of dam		
	Hereford	Hereford x Holstein	Holstein
No. of head	24	19	19
Hot carcass weight, lb.	618	651	748
Rib eye, sq. in.	12.4	12.8	13.7
Rib eye/100 lb. carcass	2.01	1.98	1.83
Fat thickness, in.	.63	.67	.55
Fat thickness/100 lb. carcass, in.	2.01	1.98	1.83
KHP Fat, %	3.3	3.3	3.1
KHP fat/100 lb. carcass, %	.53	.51	.41
Cutability, %	49.3	49.2	49.9
Carcass weight/day of age	1.45	1.46	1.59
Conformation score <sup>1</sup>	11.2	10.9	10.5
Marbling score <sup>2</sup>	13.9	15.3	15.4
Carcass grade <sup>3</sup>	9.9	10.2	10.2
Shear value <sup>3</sup>	19.8	20.7	20.5

<sup>1</sup> 9 = high good, 10 = low choice, 11 = average choice.

<sup>2</sup> Higher value indicates more marbling.

<sup>3</sup> Lower value indicates greater tenderness.