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## Performance and Carcass Characteristics of Three Groups of Crossbred Steers Fed to the Same Energy Efficiency Endpoint

R. J. Lipsey, M. E. Dikeman, and J. G. Riley

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### Summary

Sixteen Maine Anjou and 16 Gelbvieh steer calves from Angus or Hereford crossbred dams, and 16 Hereford X Angus crossbred steers were fed the same ration in individual pens until they reached a weekly energy efficiency endpoint of 10.3 lb. of feed per pound of gain above their maintenance requirements.

Both the Gelbvieh and the Maine Anjou crosses were fed an average of 70 days longer, weighed 200 lb. more at slaughter, and gained 0.3 lb. per day more than Hereford X Angus crossbred steers. The Hereford X Angus carcasses averaged 0.1 inch more fat at the 12th rib and 0.5 poorer U.S.D.A. yield grade. The average U.S.D.A. Quality Grade was highest for the Maine Anjou crosses, lowest for Gelbvieh crosses and intermediate for Hereford X Angus crosses.

### Introduction

More energy is required to produce tissue weight gain if the gain includes a large proportion of fat rather than a large proportion of muscle. As an animal grows, the percentage of gain taken up by fat increases, so more energy is required per pound of gain.

This report is only preliminary. Few conclusions can be drawn until more statistics are available.

We measured the feed intake of 3 groups of cattle individually and each week calculated the average energy each steer had used to gain one pound of body weight. When the steers reached a predetermined energy efficiency endpoint, they were slaughtered at the KSU Meat Laboratory and the carcasses were analyzed for percentages of muscle, fat and bone, and quality grades and yield grades were determined.

### Experimental Procedure

December 1, 1973, we obtained 16 Maine Anjou and 16 Gelbvieh steer calves from Angus or Hereford crossbred dams, and 16 Hereford X Angus steers of common environmental background. They were born in March and April, 1973, and purchased from the U. S. Meat Animal Research Center, Clay Center, Nebraska. They were group fed by breed until March 21, 1974, when they were randomly assigned to individual feeding pens. Daily feed records were kept so that by ration analyses and weekly weighing, we could calculate the available energy to each steer above

his energy required for maintenance. The finishing ration was 30% corn silage, 41% milo, 25% corn and 4% protein-mineral supplement on an as-fed basis. When a steer's weekly feed efficiency exceeded 10.3 lb. of feed per pound of gain above his maintenance requirements, he was slaughtered. After the carcass was chilled two days, carcass data were collected, and the right side round was separated into lean, fat and bone.

### Results and Discussion

Because the data are only preliminary, we caution against steadfast conclusions; however, the Maine Anjou and Gelbvieh sired steers apparently used energy above maintenance more efficiently when nearly 200 pounds heavier than the Hereford X Angus crosses. The Maine Anjou and Gelbvieh steers also had more than 0.3 lb. advantage in A.D.G. even though they were on feed more than 70 days longer.

The Hereford X Angus steers showed no advantage in quality grade over the average of the Maine Anjou and Gelbvieh sired steers, although they averaged 0.1 inch more external fat at the 12th rib. Yield grade of Hereford X Angus steers was 0.5 poorer than Maine Anjou and Gelbvieh crosses when slaughtered at the same energy efficiency endpoint above maintenance.

Other information we hope to obtain from this project is testing whether or not cattle at the same point of efficiency in energy used above maintenance are at the same physiological maturity. At the same physiological maturity, they should have the same carcass percentages of bone, fat and muscle. We also plan to analyze the economics of feeding the three breed types to the same efficiency endpoint. That will include the growing period after weaning as well as the finishing phase.

Table 20.1. Breed Averages for Performance of Steers Fed Individually March 21 to Slaughter.

Breed	Initial wt., lb.	Final wt., lb.	Days on feed	A.D.G., lb.
Hereford X Angus	827	1113	122	2.33
Maine Anjou crosses	803	1319	196	2.64
Gelbvieh crosses	772	1306	199	2.69

Table 20.2. Breed Averages for Carcass Fat, Yield Grade, and Quality Grade.

Breed	Adjusted fat thickness, in.	U.S.D.A. yield grade	U.S.D.A. quality grade <sup>a</sup>
Hereford X Angus	0.64	4.0	11.6
Maine Anjou crosses	0.53	3.4	12.1
Gelbvieh crosses	0.53	3.4	11.3

<sup>a</sup>11 = high good, 12 = low choice, 13 = average choice, etc.