measures of cow efficiency are similar to what was obtained when these cows were younger (Belcher *et al.*, 1978; Frahm *et al.*, 1979, for productivity of 2- and 3-year-old cows, respectively).

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Performance to Weaning of Three-Breed Cross Calves Sired by Charolais and Limousin Bulls

D.M. Marshall, R.R. Frahm and C.G. Chenette

Story in Brief

Various two-breed cross cow groups were mated to Charolais and Limousin bulls to produce a total of 574 three-breed cross calves over a two-year period. Average birth weights were 81.2 lb and 76.2 lb for calves produced from Charolais and Limousin sires, respectively. Calving assistance was required for 12.4 percent of Charolais-sired calves and 4.0 percent of the Limousin-sired calves. Charolais-sired calves outgained Limousin-sired calves by .11 lb/day from birth to weaning (2.04 **vs.** 1.93 lb/day) and were 29 lb heavier at weaning (515 **vs.** 486 lb). At weaning, calves from both sire breeds were very uniform and had quite acceptable conformation scores.

Introduction

Previous research has well established that systematic crossbreeding can substantially increase efficiency of beef production. An extensive research program is in progress at the Oklahoma Agricultural Experiment Station to evaluate lifetime productivity of various two-breed cross cows when mated to bulls of a third breed. The breed of sire used in this type of system is important to produce growthy, efficient three-breed cross calves which will perform adequately in the feedlot and have desirable carcasses. The purpose of this study was to compare the performance to weaning of three-breed cross calves sired by Charolais and Limousin bulls.

Experimental Procedure

Charolais and Limousin bulls were mated to eight different crossbred cow groups (Hereford x Angus, Angus x Hereford, Simmental x Angus, Simmental x Hereford,

Brown Swiss x Angus, Brown Swiss x Hereford, Jersey x Angus and Jersey x Hereford) to produce three-breed cross calves in the spring of 1978 and 1979. The cow herd consisted of 3-, 4- and 5-year-old and 4-, 5- and 6-year-old cows at the time of calving in 1978 and 1979, respectively. A different set of eight Limousin sires was used each year, while a total of 13 Charolais sires were used over the two breeding seasons (three of the Charolais sires were used both seasons). A total of 291 calves were sired by Charolais bulls over the two years while Limousin bulls sired 283 calves over the same period.

The cow herd is located at the Lake Carl Blackwell Research Range west of Stillwater and managed on native and bermudagrass pastures. However, 35 of the calves produced in 1978 were born and reared to weaning in drylot at the Southwest Livestock and Forage Research Station at El Reno. Calves were born primarily during February-March each year. For each calving, a score was assigned by the herdsman to indicate level of calving difficulty on a scale ranging from 1 = no difficulty to 5 = caesarian birth or abnormal presentation. Birth weights were also obtained within 24 hours of calving. Calves were weaned at an average age of 205 days, at which time each calf was weighed and assigned a subjective condition score and conformation score by a panel of at least three persons.

Results and Discussion

Means of the various traits measured to weaning for the crossbred calves of each sire breed are presented in Table 1. Mean performance has been averaged over both sexes for the 2 years. On the average, Charolais-sired calves were 5.0 lb heavier at birth than calves produced by Limousin sires. This difference in birth weight likely accounts for most of the 8.4 percent higher incidence of calving difficulty experienced by calves sired by Charolais bulls. Percent calving difficulty is the percentage of births receiving a calving score of 3, 4 or 5.

Growth performance to weaning significantly favored Charolais-sired calves. Calves sired by Charolais bulls outgained Limousin-sired calves by .11 lb/day from birth to weaning. Heavier birth weight and more rapid rate of growth resulted in

Table 1. Performance to weaning of three-breed cross calves sired by Charolais and Limousin bulls

	Breed of sire[1]		Difference
Trait	Charolais	Limousin	Charolais-Limousin
Number of calves	291	283	—
Birthweight, lb	81.2	76.2	5.0**
Calving difficulty score[2]	1.31	1.11	.20**
Calving difficulty, %[3]	12.4	4.0	8.4**
Preweaning ADG, lb/day	2.04	1.93	.11**
205-day weaning weight, lb[4]	515	486	29**
Weaning conformation score[5]	13.9	13.8	.10*
Weaning condition score	5.2	5.0	.20**

[1]Means are averaged over years and sexes.
[2]Calving difficulty: 1= no difficulty, 2= little difficulty, 3= moderate difficulty, 4= major difficulty and 5= caesarian.
[3]Percent calving difficulty is the percentage of births receiving a calving difficulty score of 3,4 or 5.
[4]Weaning weights were adjusted for age of calf and age of dam.
[5]Conformationscore equivalents: 12= low choice, 13= average choice and 14= high choice.
[6]Condition score equivalents: range from 1= very thin to 5= average to 9= very fat.
*Differences significant at the .05 probability level.
**Differences significant at the .01 probability level.

Charolais-sired calves averaging 29 lb heavier at weaning than Limousin-sired calves. Average conformation scores were quite acceptable for calves from both sire breeds with the Charolais-sired calves having only a slight advantage. Charolais-sired calves also had a slightly higher condition score.

In spite of the large diversity in the kinds of crossbred cow groups involved, calves from both sire breeds were very uniform and quite acceptable as feeder calves. There is good rationale for selecting either sire breed. Charolais would be the sire breed of choice on the basis of weaning weight, whereas Limousin would be the breed of choice on the basis of lighter birth weight and less calving difficulty.

As a group, the three-breed cross calves performed quite well to weaning and were a uniform, desirable set of feeder calves that performed quite satisfactorily in the feedlot. Feedlot performance and carcass evaluation of the crossbred calves born in 1978 were reported by Frahm *et al.*,(1980).

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