

# Preliminary Report on the Effect of Different Proportions of Brahman Breeding on Calf Growth and Development of Heifers Through First Breeding

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## Story in Brief

Preweaning growth of calves and subsequent growth and reproductive development of heifers were evaluated on the first Brahman crosses produced as part of a long term project to evaluate overall productivity of crossbred cows with different proportions of Brahman breeding. Angus, Hereford, Brahman, Brahman-Angus and Brahman-Hereford bulls were mated to Hereford and Angus cows to produce crossbred calves that were O Brahman (Angus-Hereford, Hereford-Angus),  $\frac{1}{4}$  Brahman ( $\frac{1}{4}$  Brahman:  $\frac{3}{4}$  Angus:  $\frac{1}{2}$  Hereford,  $\frac{1}{4}$  Brahman:  $\frac{3}{4}$  Hereford:  $\frac{1}{2}$  Angus) and  $\frac{1}{2}$  Brahman (Brahman-Hereford, Brahman-Angus). A total of 176 crossbred calves were produced in the spring of 1981. Following weaning at 205 days of age, all heifer calves were developed to calve at two years of age when bred to Limousin bulls.

At birth  $\frac{1}{4}$  Brahman and  $\frac{1}{2}$  Brahman calves were heavier ( $P < .01$ ) by 5 and 9 lb, respectively, and at weaning by 18 ( $P < .10$ ) and 41 lb ( $P < .01$ ), respectively. Also,  $\frac{1}{4}$  Brahman and  $\frac{1}{2}$  Brahman calves were 2 and 3.3 in. taller ( $P < .01$ ), respectively, and had condition scores .5 and .7 units lower ( $P < .01$ ), respectively, than O Brahman calves. At a year of age  $\frac{1}{4}$  Brahman and  $\frac{1}{2}$  Brahman heifers were 35 ( $P < .05$ ) and 60 lb ( $P < .01$ ) heavier, respectively, and 1 and 2.2 in. taller ( $P < .01$ ), respectively, than O Brahman heifers. The average age at puberty for those heifers cycling prior to the start of breeding was 22 and 24 days younger ( $P < .01$ ) for  $\frac{1}{4}$  Brahman and  $\frac{1}{2}$  Brahman, respectively, than O Brahman heifers. However, weight at puberty was similar for all three crossbred groups. Also, prebreeding weights and condition scores were similar for all three crossbred groups. Conception rate was good for all three crossbred groups with 94 percent of all heifers exposed conceiving.

These data indicate that calves with some proportion of Brahman breeding may perform better through weaning and that reproductive performance of Brahman cross heifers is at least equal to that of crossbred heifers with no Brahman breeding.

## Introduction

In recent years, there has been an increased interest in Brahman cross cattle. In order to produce calves with a "little ear and hump" some cattlemen have incorporated Brahman cross cows into their herds. Therefore a project was initiated at the Oklahoma Agricultural Research Station to evaluate overall productivity of Brahman cross cows and to determine what proportion of the cow should be of Brahman breeding to achieve maximum production efficien-

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cy. The objective of this particular study was to evaluate the effect of different proportions of Brahman breeding on preweaning growth of calves and the subsequent growth and reproductive performance of the heifers that were produced as part of this extensive project.

## Materials and Methods

The data utilized in this study were collected in the initial stage of a long term project designed to evaluate productivity of crossbred cows with different proportions of Brahman breeding when managed under spring vs fall calving programs. Angus, Hereford, Brahman, Brahman-Angus and Brahman-Hereford bulls were mated to Angus or Hereford cows to produce 176 crossbred calves in the spring of 1981 that were O Brahman (Angus-Hereford, Hereford-Angus),  $\frac{1}{4}$  Brahman ( $\frac{1}{4}$  Brahman: $\frac{1}{4}$  Hereford: $\frac{1}{2}$  Angus,  $\frac{1}{4}$  Brahman: $\frac{1}{4}$  Angus: $\frac{1}{2}$  Hereford) or  $\frac{1}{2}$  Brahman (Brahman-Angus, Brahman-Hereford).

Cows were managed on native and bermuda grass pastures at the Southwestern Livestock and Forage Research Station at El Reno. Calves were born from early February through April and birth weights were recorded within 24 hours after birth. Calves were allowed to run with their dams on pasture and received no creep feed. After weaning at an average age of 205 days, steer calves were allotted to trials to evaluate basic biological differences between crossbred groups while all heifers were developed to calve at two years of age.

After weaning, heifers were maintained as a separate group on native and bermuda grass pasture. In addition they received a corn based concentrate mix and oat/alfalfa silage. Puberty of the heifers was defined to be the time of the first observed standing heat. Heifers were exposed to marker bulls which had deflected penises and were observed at least twice daily for heat detection. At approximately fifteen months of age, heifers were randomly mated to four Limousin bulls during a 60-day breeding season and were pregnancy checked approximately 65 days after bulls were removed from the pastures.

Preweaning growth of calves and subsequent growth and development of heifers were evaluated using least squares procedures.

## Results and Discussion

Performance through weaning of calves with different proportions of Brahman breeding is presented in Table 1. Average birth and weaning weights for O Brahman calves were 77 and 475 lb, respectively. At birth,  $\frac{1}{4}$  Brahman and  $\frac{1}{2}$  Brahman calves were heavier ( $P < .01$ ) by 5 and 9 lb, respectively, and at weaning by 18 and 41 lb ( $P < .01$ ), respectively. Also,  $\frac{1}{4}$  Brahman and  $\frac{1}{2}$  Brahman calves were 2 and 3.3 in. taller ( $P < .01$ ), respectively, at weaning than O Brahman calves. Conformation scores were similar for all three crossbred groups; however, average condition score of 5.8 units for O Brahman calves was .5 and .7 units higher ( $P < .01$ ) than for  $\frac{1}{4}$  Brahman and  $\frac{1}{2}$  Brahman calves, respectively.

Postweaning growth and reproductive performance were evaluated on 73 heifers. Performance through a year of age is presented in Table 2. At a year of age, O Brahman heifers weighed an average of 637 lb and were 44.5 in. tall at the hip and  $\frac{1}{4}$  Brahman heifers and  $\frac{1}{2}$  Brahman heifers were 35 ( $P < .05$ )



**Table 1. Prewearing performance of calves with different proportions of Brahman breeding**

Proportion Brahman	No. of calves	Trait					
		Birth wt (lb)	Prewearing ADG (lbs/day)	Weaning			
				Wt (lb)	Ht (in)	Conf. <sup>1</sup>	Cond. <sup>2</sup>
0	44	77 <sup>c</sup>	1.9 <sup>b</sup>	475 <sup>b</sup>	40.7 <sup>c</sup>	12.9 <sup>a</sup>	5.8 <sup>a</sup>
¼	92	82 <sup>b</sup>	2.0 <sup>ab</sup>	493 <sup>b</sup>	42.7 <sup>b</sup>	12.7 <sup>a</sup>	5.3 <sup>b</sup>
½	40	86 <sup>a</sup>	2.1 <sup>a</sup>	516 <sup>a</sup>	44.0 <sup>a</sup>	12.9 <sup>a</sup>	5.1 <sup>b</sup>

abc Means not sharing at least one common superscript differ at the .05 probability level.

<sup>1</sup>Conformation: 12 = low choice, 13 = average choice.

<sup>2</sup>Condition: 1 = thin to 9 = fat with 5 = average fat.

**Table 2. Yearling performance of heifers with different proportions of Brahman breeding**

Proportion Brahman	No. of heifers	Trait				
		Weaning to yearling ADG (lb/day)	Yearling			
			Wt (lb)	Ht (in)	Conf. <sup>1</sup>	Cond. <sup>2</sup>
0	18	.94 <sup>b</sup>	637 <sup>b</sup>	44.5 <sup>c</sup>	13.5 <sup>a</sup>	5.5 <sup>a</sup>
¼	37	1.16 <sup>a</sup>	672 <sup>a</sup>	45.5 <sup>b</sup>	13.4 <sup>a</sup>	5.4 <sup>a</sup>
½	18	1.27 <sup>a</sup>	697 <sup>a</sup>	46.7 <sup>a</sup>	13.0 <sup>b</sup>	4.9 <sup>b</sup>

abc Means not sharing at least one common superscript differ at the .05 probability level.

<sup>1</sup>Conformation: 13 = average choice, 14 = high choice.

<sup>2</sup>Condition: 1 = thin to 9 = fat with 5 = average fat.

and 60 lb ( $P < .01$ ) heavier, respectively, and 1 and 2.2 in. taller ( $P < .01$ ), respectively.

Reproductive performance of heifers with different proportions of Brahman breeding is summarized in Table 3. The heifers were observed for detection of heat as described earlier with 88, 68 and 72 percent of the 0, ¼ and ½ Brahman heifers, respectively, observed to be cycling. At time of puberty, all three crossbred groups had similar weights, although ½ Brahman heifers were 1.6 in. taller than 0 Brahman heifers (46.2 vs 44.6 in.,  $P < .01$ ). Although a higher proportion of the 0 Brahman heifers were detected as cycling prior to the start of breeding, the average age at puberty for those heifers cycling was less ( $P < .01$ ) for the ¼ Brahman and ½ Brahman heifers by 22 and 24 days, respectively. Prebreeding weights and condition scores were similar for all three crossbred groups. Conception rate was good for all three crossbred groups with 94 percent of all heifers exposed conceiving.

In summary, based on these data it appears that it may be advantageous to producers to have some proportion of Brahman breeding in calves for growth through weaning and that reproductive performance of Brahman cross heifers is at least equal to that of "black baldy" type heifers. However, evaluation of future crossbred calf crops is necessary before further conclusions can be made.

**Table 3. Reproductive performance of heifers with different proportions of Brahman breeding**

Proportion Brahman	No. of heifers	Percent cycling <sup>2</sup>	Trait					
			Puberty			Prebreeding		Conception rate, % <sup>2</sup>
			Age (days)	Wt (lbs)	Ht (in)	Wt (lbs)	Cond. 1	
0	18	88	384 <sup>a</sup>	655 <sup>a</sup>	44.6 <sup>b</sup>	780 <sup>a</sup>	6.3 <sup>a</sup>	88
1/4	37	68	362 <sup>b</sup>	670 <sup>a</sup>	45.7 <sup>ab</sup>	781 <sup>a</sup>	6.1 <sup>a</sup>	100
1/2	18	72	360 <sup>b</sup>	678 <sup>a</sup>	46.2 <sup>a</sup>	786 <sup>a</sup>	6.2 <sup>a</sup>	89

<sup>ab</sup>Means not sharing at least one common superscript differ at the .05 probability level.

<sup>1</sup>Condition: 1 = thin to 9 = fat with 5 = average fat.

<sup>2</sup>Differences not significant as per Chi Square test.