



Evaluation of Angus-, Gelbvieh-, Brangus- and Gelbray-sired Crossbred Calves for Preweaning Performance

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Findings

- # Spring-born calves had greater preweaning daily gains and were heavier at weaning than fall-born calves.
- # Calf preweaning performance was similar among straightbred and Brahman composite bulls when mated to F₁ Brahman x Hereford cows.

Introduction

Most commercial cow-calf herds in Louisiana are composed of a small number of cows that consist of a crossbred combination of Brahman, British, Continental and possibly some dairy breeding. The first-cross Brahman has been recognized as one of the most productive brood cows throughout the South because of her superior adaptability and productivity under the hot, humid environmental conditions.

Crossbreeding is widely recognized as an excellent management tool for improving productivity through the exploitation of heterosis and the combination of desirable traits from different breeds. Heterosis is the superiority exhibited by the crossbred individual for a particular trait (weaning weight) relative to the average of the straightbred parents. Crossbreeding can result in an increase in overall productivity ranging from 9 percent to 28 percent.

A major disadvantage of traditional crossbreeding systems is that several breeding pastures (or artificial insemination) are necessary for these systems to be implemented

and effective. For most producers with cow herds of a 100 animals or less, traditional crossbreeding systems are not feasible. Another negative of crossbreeding is that it is almost impossible to produce the optimum market steer calf and the optimum replacement heifer from the same mating system because carcass characteristics and maternal traits are antagonistic.

In this crossbreeding study, one of the main objectives was to compare straightbred- and composite-sired progeny that vary in percentage of Brahman inheritance. In addition, British (Angus) and Continental (Gelbvieh) sire breeds were evaluated along with their Brahman derivative counterparts [Brangus (5/8 Angus-3/8 Brahman) and Gelbray (5/8 Gelbvieh-3/8 Brahman)]. This study evaluated the use of these sire breeds in a mating system for producing weaned calves that contain either 1/4 or 7/16 Brahman breeding with either British or Continental influence.

Experimental Approach

A total of 503 calves were weaned from both spring- and fall-calving seasons over a four-year period. First cross (F₁), Brahman x Hereford cows were sorted by cow age and were randomly allotted each year to one of eight breeding groups so that dam age was equally represented in all groups. Groups of cows were exposed each year to either Angus (A), Gelbvieh (G), Brangus (BA), or Gelbray (GB) sires. A total of 29 sires were used to produced the calves. This represented 9 A, 7 G, 6 BA and 7 GB sires. The mating scheme by sire breed is presented in Table 1.

Spring-calving cows were exposed to bulls from May 1 through June 30. Calves were born from early February through mid-April in 1993 through 1996, with weaning occurring in late September each year. Cows and calves were placed on bermudagrass pastures during the preweaning period. Before bermudagrass became available, cows were fed bermudagrass hay and an energy supplement (3 to 5 lb/head/day of ground corn).

Fall- (and late summer) calving cows were exposed to bulls from Oct. 15 through Dec. 14. Calves were born from late July through early October in 1993 through 1996, with weaning occurring in mid-April each year. Calves were weaned at this time so they could be placed into a stocker grazing program on bermudagrass pastures in late April. During the preweaning period, cows and calves grazed bermudagrass forage until it became dormant. After, cows were supplemented with bermudagrass hay and an energy supplement (3 to 5 lb/head/day of ground corn). No grazing of cool-season annuals (ryegrass) was used for either calving system in the preweaning period.

Cows were palpated about 60 days after the end of the breeding season, and open cows were reassigned to the alternate calving season to allow production of as many calves as possible. Cows palpated as open after the second consecutive breeding season were culled. Birth, preweaning and weaning records were maintained on each calf. All male calves were castrated at birth. Creep-feeding was not practiced. Recommended health and management practices were followed on the cows and calves.

Results and Discussion

Fall-born calves were heavier ($P < .05$) at birth than spring-born calves (Table 2). The average daily gain for spring-born calves, however, was 0.45 pound more ($P < .01$) than that of fall-born calves. This resulted in

heavier ($P < .05$) weaning weights and adjusted 205-day weights for spring-born calves than that of fall-born calves (Table 2). It is important to note that the majority of the preweaning period for the fall-born calves occurred when the bermudagrass was dormant. Cows and calves in this calving system were provided free-choice bermudagrass hay and 3 to 5 pounds of ground corn per cow. Under this type of nutritional program, the growth potential of fall-born calves was apparently hindered, thus resulting in substantially lower preweaning weight gains compared to spring-born calves.

Male calves were heavier ($P < .05$) for birth weight, weaning weight and 205-day weight and had greater ($P < .05$) preweaning gains than female calves (Table 2). Likewise, weaning hip height was greater ($P < .07$) for male calves than for females calves.

Table 3 shows the performance of preweaning traits of crossbred calves by sire breed. There was no change in rank of sire breed across the two calving seasons. The range in birth weights was from 77 pounds for A-sired calves to 82 pounds for G-sired calves. Rate of average daily gain was similar ($P = .52$) among sire breeds (1.77 to 1.83 pounds/day). Actual weaning weight ranged from 495 pounds for A-sired calves to 466 pounds for GB-sired calves and was similar among sire breeds ($P = .28$). When weaning weight was adjusted to an age-constant basis (205-day weight), the variation among sire breed was reduced (443 to 453 pounds).

A possible explanation for the lack of variation in preweaning performance among sire breeds could be that the maternal ability of the F_1 Brahman x Hereford cow tended to "mask" any differences in growth potential among these breeds. These calves will be evaluated for potential as replacement heifers, stockers, feeders and for carcass merit.

An attempt was made to sample sires of each breed in this study that would be representative of the type of bulls used by

commercial cattle producers in this state.

However, because of the relatively small number of bulls sampled (n=29) in this study, true representation of the average of each respective sire breed may not have been attained.

Table 1. Mating Scheme for Production of Crossbred Calves

Sire breed		Dam breed		Progeny breed composition	Portion of Brahman breeding
Angus (A)	X	B ₁ H ₁ ^a	⇒	A ₂ B ₁ H ₁	1/4
Gelbvieh (G)	X	B ₁ H ₁	⇒	G ₂ B ₁ H ₁	1/4
Brangus (A ₅ B ₃)	X	B ₁ H ₁	⇒	B ₇ A ₅ H ₄	7/16
Gelbray (G ₅ B ₃)	X	B ₁ H ₁	⇒	B ₂ G ₅ H ₄	7/16

^a F₁ Brahman x Hereford

Table 2. Prewaning traits of crossbred calves by season of birth and sex of calf

Item	No.	Birth wt., lb	Prewaning avg. daily gain, lb	Actual weaning wt., lb	Adjusted 205-day wt., lb	Weaning hip height, in
Fall-born	194	80 ± 1 ^a	1.57 ± .03 ^a	470 ± 8 ^a	402 ± 7 ^a	45.1 ± .2 ^a
Spring-born	309	78 ± 1 ^b	2.02 ± .03 ^b	484 ± 7 ^b	492 ± 6 ^b	44.7 ± .2 ^b
Female	247	78 ± 1 ^a	1.75 ± .03 ^a	466 ± 8 ^a	436 ± 6 ^a	44.6 ± .2 ^c
Male	256	81 ± 1 ^b	1.84 ± .03 ^b	488 ± 8 ^b	458 ± 6 ^b	45.2 ± .2 ^d

^{a,b}Means in same column within season of birth and sex of calf with different letters in their superscript differ (P < .05).

^{c,d}Means in same column within sex of calf with different letters in their superscript differ (P < .07).

Table 3. Prewaning traits of crossbred calves by sire breed

Sire breed	No.	Birth wt., lb	Prewaning avg. daily gain, lb	Actual weaning wt., lb	Adjusted 205-day wt., lb	Weaning hip height, in
Angus	137	77 ± 2	1.83 ± .04	495 ± 11	453 ± 8	45.1 ± .3
Gelbvieh	129	82 ± 2	1.80 ± .04	477 ± 12	450 ± 9	45.0 ± .3
Brangus	121	78 ± 2	1.78 ± .04	470 ± 13	443 ± 9	45.1 ± .3
Gelbray	116	81 ± 2	1.77 ± .04	466 ± 12	443 ± 9	44.6 ± .3
Overall	503	80	1.80	477	447	45.0
Probability level	--	.20	.52	.28	.72	.50