Louisiana State University
Agricultural Center

# Effects of Breed Type, Creep Feeding and Growth Implants on Heifer Pre- and Postweaning Growth and Reproductive Performance

W. E. Wyatt, D. L. Thompson, Jr., D. C. Blouin, and R. A. Harpel
Iberia Research Station, Department of Animal Science, and Department of Experimental Statistics

**Findings**

- Pelvic area at 19 months of age and calving weight were greater for Brangus than Angus first-calf cows, and Brangus cows had a lower incidence of calving difficulty.
- Heifers that were implanted (Synovex-C) as suckling calves had greater weaning and pre-breeding weights than non-implanted heifers.
- The approximate $1.25 per heifer investment for implanting resulted in an approximate $16 greater market value at weaning.
- Implanting heifers as suckling calves generally had no ill effect on their reproductive performance as cows.

## Introduction

Implanting calves with hormonal growth promoters (e.g., Ralgro, Compudose, Synovex-C, etc.) while nursing their dams is an economical management practice for commercial cow-calf producers. However, the effectiveness of growth implants are dependent upon the nutritive diet available to the calf. Declining forage quantity and quality in the late-summer and fall season occurs at the same time that the calf is receiving less milk from its mother. This situation may not provide a sufficient nutritional base for the best performance of implanted calves.

Supplemental feeding of a limit-fed, high-protein creep ration (cottonseed meal plus salt) to implanted calves was thought to have the potential of further increasing calf preweaning weight gain. The initial objective of this study was to evaluate the potential of a limit-fed high protein (cottonseed meal) creep and an FDA-approved growth promotant (Synovex-C) to increase weaning (market) weights in spring-born Angus and Brangus suckling calves. The impact of these treatments on calf preweaning growth was reported in the 1997 Beef Cattle Research Report. All heifer calves from the 1991-93 calf crops were kept as herd replacement to evaluate the impact of preweaning implants and creep on their postweaning growth and reproductive performance.

## Materials and Methods

Angus and Brangus spring-born heifer calves from the 1991-1993 calf crops were kept as herd replacements. The heifers had previously received one of four preweaning treatments as suckling calves: implant-creep **(IC)**, implant-no creep **(INC)**, no implant-creep **(NIC)** and no implant-no creep **(NINC)**. Calves in IC and INC had been implanted at approximately 2 months of age with Synovex-C implants (100 mg progesterone and 10 mg estradiol benzoate). Heifers in IC and NIC had been limit-fed (salt added) a cottonseed-meal creep for the

last 90 days prior to weaning in October. The targeted creep intake was 1 lb/calf /day. Because both bull and heifer calves had access to the same creep feeders, it is likely that the actual intake of the heifer calves was less than the daily targeted intake amount. Bull calves are presumed to have eaten more creep than did the heifer calves.

Average age at weaning was 232 days. Following weaning, Angus and Brangus heifers were fed bermudagrass hay free choice and a corn-cottonseed meal supplement (4.5 and 5.5 lb/head/day, respectively) until annual ryegrass was available for common grazing (usually in mid-January). Heifers were weighed and pelvic height and width were measured in mid-March (13-months average age) and were weighed again in mid-April, before initiation of a 81-day breeding season. Within breed type, heifers were placed in one of two breeding herds with bulls of a like breed (e.g., Angus heifers with an Angus bull).

Following the breeding season, heifers within a breed type were grouped in common. Heifers were weighed, measured for pelvic height and width, and rectally palpated in late-September at approximately 19 months of age. Heifers failing to conceive (based upon rectal palpation) were culled from the herd.

Pregnant cows (first-calf heifers) were weighed in early January, before initiation of the spring-calving season (normally begun in late January). Cows failing to calve by April 15 of each year were culled. Calf birth weight and calving difficulty score (0=no difficulty, 1=difficulty) were obtained within a 12-hour period following actual calving.

## Results and Discussion

Brangus heifers had greater (P<.01) preweaning ADG and tended to have heavier (P=.11) weaning weights than Angus heifers (Table 1). Also, Brangus heifers tended to be heavier (P<.10) as yearlings, but were similar in weight to Angus heifers before breeding season (April 15) and at 19 months of age. Pelvic area was similar for Angus and Brangus heifers at 13 months of age, but at 19 months of age, Brangus heifers had larger (P<.05) pelvic areas than Angus heifers.

Brangus heifers tended to be heavier (P<.08) before calving than did Angus heifers (Table 2). Calving rate and age at calving were similar between breed types, but Brangus cows (heifers) calved an average of 9 days later (P<.05; data not shown) in the calving season than did Angus. Although Brangus calves would be anticipated to have heavier birth weights, in this study, birth weights were similar for both Angus and Brangus calves. Percent calving difficulty was greater (P<.01) for Angus than for Brangus. This may be due to the relatively heavier birth weight to pre-calving weight ratio of Angus compared to Brangus (.084 vs .079) and the larger pelvic area of Brangus cows.

Implanted heifers had greater (P<.01) preweaning ADG and weaning weights than heifers that were not implanted during the preweaning phase (Table 1). Implanted heifers were heavier (P<.05) as yearlings and prior to breeding, but not at 19-months of age, than non-implanted heifers. While pelvic area was greater (P<.01) for implanted heifers as yearlings, there was no difference (P=.48) in pelvic area of implanted and non-implanted heifers at 19-months of age.

There was no difference in percent calving rate, precalving weight and percent calving difficulty between cows that had been implanted or not implanted as suckling calves (Table 2). Implanted cows (heifers) tended (P<.10) to be older at calving, but birth weights of their calves were similar to those from non-implanted cows.

**Table 1. Effects of breed type and preweaning treatments on heifer postweaning growth**

| Effect | n | Pre-weaning ADG, lb[ab] | Weaning wt., lb[b] | 13-month | | Pre-breeding wt., lb[b] | 19-month | |
|---|---|---|---|---|---|---|---|---|
| | | | | Wt., lb[b] | Pelvic area, $cm^{2}$ [b] | | Wt., lb | Pelvic area, $cm^{2}$ [a] |
| Breed | | | | | | | | |
| Angus | 87 | 1.84 | 505 | 642 | 182 | 715 | 851 | 217 |
| Brangus | 120 | 1.94 | 522 | 664 | 189 | 727 | 875 | 229 |
| SE | | .03 | 7.1 | 8.9 | 7.3 | 10.5 | 24.1 | 20.0 |
| Implant | | | | | | | | |
| No | 105 | 1.83 | 502 | 642 | 181 | 708 | 855 | 224 |
| Yes | 102 | 1.95 | 525 | 664 | 190 | 735 | 870 | 222 |
| SE | | .03 | 6.4 | 7.7 | 6.9 | 8.8 | 23.4 | 16.5 |
| Creep | | | | | | | | |
| No | 105 | 1.90 | 512 | 655 | 186 | 727 | 867 | 223 |
| Yes | 102 | 1.89 | 515 | 650 | 185 | 716 | 858 | 223 |
| SE | | .03 | 6.5 | 7.8 | 6.9 | 9.0 | 23.4 | 16.5 |

[a]Breed means are different (P<.05).
[b]Preweaning implant status means are different (P<.05).

This study would suggest that the 23-pound weaning weight advantage of implanted suckling heifer calves, valued conservatively at 70¢/lb. liveweight (approximately $16), more than offsets the cost of a Synovex-C implant, valued at approximately $1.25/calf. Also, the study would suggest that there were no adverse effects of implanting suckling heifer calves on their subsequent reproductive performance. Based on these results, a cow-calf producer wishing to retain suitable heifers as herd replacements and sell the remaining heifers at weaning can reasonably consider implanting all heifer calves. However, there were three incidences of heifers (out of a total of 210 heifer calves) being bred as suckling calves (precocious conception) by herd service sires in this study.

High-protein creep, limit-fed to suckling heifer calves had no effect on pre-weaning, post-weaning, or reproductive performance in this study. The targeted amount of daily creep feed consumption of 1 lb/heifer calf/day may have not been achieved or was too low a level to cause a growth or reproductive response. However, based upon this study the limit-feeding of a cottonseed meal-salt creep to suckling heifers would not be an economically sound management practice.

**Table 2. Effects of breed type and preweaning treatments on subsequent reproductive performance of first-calf heifers**

| | Calving rate | | First-calf heifer calving | | | | |
|---|---|---|---|---|---|---|---|
| Effect | n | Percent, % | n | Pre-calving weight, lb[b] | Calving age, d | Calf birth weight, lb | Percent calving difficulty, %[a] |
| Breed | | | | | | | |
| Angus | 87 | 79 | 70 | 886 | 732 | 75 | 42 |
| Brangus | 120 | 82 | 101 | 925 | 733 | 73 | 19 |
| SE | | 6 | | 23.4 | 5.4 | 2.2 | 7 |
| Implant | | | | | | | |
| No | 105 | 82 | 90 | 895 | 730 | 73 | 35 |
| Yes | 102 | 79 | 81 | 916 | 735 | 74 | 26 |
| SE | | 5 | | 21.6 | 4.2 | 2.2 | 7 |
| Creep | | | | | | | |
| No | 105 | 77 | 82 | 907 | 732 | 73 | 30 |
| Yes | 102 | 84 | 89 | 904 | 734 | 75 | 31 |
| SE | | 5 | | 21.6 | 4.2 | 2.2 | 7 |

[a]Breed means are different (P<.05).
[b]Preweaning implant status means are different (P<.05).

---

*Synovex-C implants were generously provided by Syntex Animal Health, Inc.*