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Reproductive performance of replacement heifers implanted as young calves or at weaning

Abstract

This study evaluated the effect of implanting potential replacement heifers (n=548) with Component E-C® (10 mg of estradiol and 100 mg of progesterone) between 45 and 120 days of age or at weaning (200 days of age) on future reproductive performance. Trials were conducted at five ranches in Kansas and one in Nebraska. At each location, heifers were allotted to three treatments: no implant (Control), one implant at 45 to 120 days of age (Early- IMP), or one implant at 200 days of age (Wean- IMP). No differences were detected among treatments for first service conception rate (55%), overall pregnancy rate (85%), or calving rate (80%). In addition, no differences were observed among treatments for pelvic area, reproductive tract score, or calving difficulty or for birth or weaning weights of their calves. We conclude that implanting replacement heifers with Component E-C early in life or at weaning had no effect on their subsequent reproductive performance.

Keywords

Cattlemen's Day, 1997; Kansas Agricultural Experiment Station contribution; no. 97-309-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 783; Beef; Implant; Calves; Replacement heifers; Conception rate

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**REPRODUCTIVE PERFORMANCE OF REPLACEMENT
HEIFERS IMPLANTED AS
YOUNG CALVES OR AT WEANING ¹**

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Summary

This study evaluated the effect of implanting potential replacement heifers (n=548) with Component E-C^{4,5} (10 mg of estradiol and 100 mg of progesterone) between 45 and 120 days of age or at weaning (200 days of age) on future reproductive performance. Trials were conducted at five ranches in Kansas and one in Nebraska. At each location, heifers were allotted to three treatments: no implant (Control), one implant at 45 to 120 days of age (Early-IMP), or one implant at 200 days of age (Wean-IMP). No differences were detected among treatments for first service conception rate (55%), overall pregnancy rate (85%), or calving rate (80%). In addition, no differences were observed among treatments for pelvic area, reproductive tract score, or calving difficulty or for birth or weaning weights of their calves. We conclude that implanting replacement heifers with Component E-C early in life or at weaning had no effect on their subsequent reproductive performance.

(Key Words: Implant, Calves, Replacement Heifers, Conception Rate.)

Introduction

Although implanting weaned heifers and steers destined for the feedlot enhances their rate of growth, growth benefits also are observed when calves are implanted at younger ages, before their selection as future replacements. Conflicting reports exist concerning the effects of early implanting of heifers on their subsequent reproductive performance. Therefore, our objective was to determine the effect of early implantation with Component E-C on future reproductive performance of replacement heifers.

Experimental Procedures

This study involved 548 calves located at five ranches in Kansas and one in Nebraska. Heifer calves at each location were assigned to three treatments at 45 to 120 days of age. Controls received no implant. Early implanted (Early-IMP) calves received one Component E-C implant between 45 and 120 days of age. Weaning-implanted (Wean-IMP) calves received one Component E-C implant between 192 and 205 days of age. A single Component E-C implant contains 10 mg of estradiol and 100 mg of progesterone. Heifers were weighed at the onset of the study, weaning, 1 year of age, and pre-calving. All heifers remained with their dams until 6 to 8 months of age. A single technician made pelvic measurements at approximately 12 months of age. Reproductive

¹Sincere appreciation is expressed to Ivy Laboratories, Overland Park, KS for financial support.

²Ivy Laboratories, Inc., Overland Park, KS.

³Department of Statistics.

⁴Marketed by VetLife, Overland Park, KS. Previously known as Implus-C[®] and Calfoid[®].

⁵Now cleared for use in replacement heifers.

tract scores were assessed at 12 months of age by palpation per rectum. Tracts were scored from 1 to 5; with 1 being an infantile tract (prepubertal) and 5 indicating good uterine tone, at least one large ovarian follicle, and a corpus luteum (cycling). All heifers were inseminated artificially during at least a 21-day period and pregnancy was diagnosed by ultrasonography after a 45- to 60-day breeding season. Subsequent calving difficulty was scored from 1 to 5 (1=no assistance and 5=cesarean section). Birth and weaning weights of their calves were recorded.

Results and Discussion

Implanting heifers at 45 to 120 days improved weaning and yearling weights (Table 1), but had no effect on first service conception rate, overall pregnancy rate or calving rate among the three treatments (Table 2). Similarly, no differences were detected for pelvic area, reproductive tract score, or calving difficulty of implanted heifers. Birth and weaning weights of calves born to implanted heifers were unaffected by treatments (Table 3). We concluded that implanting heifer calves as early as 45 days of age with Component E-C had no effect on their subsequent reproductive performance.

Table 1. Effect of Treatment on Weight Change of Implanted and Control Heifers

| Treatment | Beginning ^a | Weaning | Prebreeding |
|-------------------|------------------------|--------------------|---------------------|
| Control, lb | 254.3 | 561.7 ^x | 775.1 ^x |
| Early-implant, lb | 251.7 | 578.4 ^y | 790.5 ^y |
| Wean-implant, lb | 258.6 | 564.3 ^x | 785.2 ^{xy} |

^aHeifers were 45 to 120 days of age at the beginning of the study.

^{xy}Averages within columns lacking a common superscript letter differ (P<.05).

Table 2. Conception and Calving Rate for Control, Early-IMP, and Wean-IMP Heifers

| Treatment | First Service | Overall | |
|-----------|-------------------|------------------|----------------|
| | Conception Rate % | Pregnancy Rate % | Calving Rate % |
| Control | 55.6 | 84.5 | 78.3 |
| Early-IMP | 56.2 | 85.6 | 81.0 |
| Wean-IMP | 52.1 | 84.6 | 80.7 |

Table 3. Reproductive Traits for Control, Early-IMP and Wean-IMP Heifers and Weights of Their Calves

| Treatment | Heifers | | | Calves | |
|-----------|---|---------------------------------------|--------------------|------------------|--------------------|
| | Pelvic Area, ^a cm ² | Reproductive Tract Score ^a | Calving Difficulty | Birth Weight, lb | Weaning Weight, lb |
| Control | 165 | 3.7 | 1.5 | 72 | 493 |
| Early-IMP | 176 | 3.8 | 1.4 | 71 | 489 |
| Wean-IMP | 171 | 3.8 | 1.4 | 74 | 487 |

^aMeasured at 12 months of age.