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George A. Perry
South Dakota State University

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Effect of Using CIDRs for Seven Days Before the Introduction of Bulls on the Proportion of Cows Conceiving Early in the Breeding Season¹

George A. Perry²
Department of Animal and Range Sciences

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Summary

Cows that conceive earlier in the breeding season wean calves that are older and heavier at weaning. Therefore, the objective of this study was to determine the ability of a CIDR to increase the proportion of cows that conceived early during a natural service breeding season. Two hundred twenty-two postpartum beef cows were allotted to one of two treatments: 1) cows were treated with a CIDR for 7 days before bulls were introduced (n = 100), 2) cows were not treated and served as a control (n = 122). Seven days before bulls were introduced to the herd CIDRs were inserted into the CIDR treated cows, and were removed the day bulls were placed with the herd. The percentage of CIDR treated cows that conceived during the first 14 days of the breeding season tended (P = 0.08) to be greater compared to the control group. Beginning on day 21 of the breeding season a similar (P > 0.35) percentage of CIDR treated and control cows had conceived. In summary, a CIDR alone tended to increase the proportion of cows that conceived during the first 14 days of the breeding season.

Introduction

Synchronizing estrus is an effective way to maximize the use of time and labor required to detect standing estrus in cattle. However, estrous synchronization can also benefit overall herd management. Cows that are synchronized: 1) exhibit standing estrus at a predicted time, 2) conceive earlier in the breeding season, and 3) wean calves that are older and heavier at weaning. In addition certain estrous synchronization protocols can induce non-cycling cows to begin estrous cycles. This will

decrease the anestrous postpartum interval and allow for more chances for cows to conceive during a defined breeding season.

The anestrous postpartum interval is a major contributing factor to cows failing to become pregnant and calving on a yearly interval. A short luteal phase can further delay the interval from calving to conception and usually occurs following the first postpartum ovulation. Treatment with a controlled internal drug-releasing device (**CIDR**) can induce ovulation in postpartum anestrous cows and eliminate the occurrence of short estrus cycles (Perry et al., 2004). Therefore, many estrous synchronization protocols have included the use of a CIDR. Estrous synchronization can be an effective method of increasing the proportion of animals bred early in the breeding season resulting in a shorter calving season, and a more uniform calf crop. Cows that conceived to a synchronized estrus calved 13 days earlier and weaned calves 21 pounds heavier than nonsynchronized females (Schafer et al., 1990).

The time and labor required to detect estrus often makes AI impractical (Britt, 1987), and current surveys indicate that fewer than 5% of beef cows in the United States are bred by AI and estrous synchronization is only used by half of the producers that utilize AI (Corah and Kiracofe, 1989; NAHMS, 1994). Therefore, the objective of this study was to determine the ability of a CIDR alone to get more cows bred by natural service early in the breeding season.

Materials and Methods

Postpartum multiparous (3 to 11 years old) angus based beef cows located on a ranch in eastern South Dakota were divided into two treatment groups based on age, days postpartum, and body condition score. Treatments consisted of 1: untreated late calving cows (between 27 and 68 days postpartum; n =

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² Assistant Professor

122), and 2: synchronized late calving cows (between 27 and 69 days postpartum; $n = 100$). Synchronized cows had a Controlled Internal Drug Release (CIDR; Pfizer, New York, New York) inserted into the vagina on day -7 and removed on day 0. All cows were placed with fertile bulls ($n = 9$) that had successfully passed a breeding soundness exam on day 0 at a bull to cow ratio of 1:25. All cows were managed as a single group throughout the breeding season. Pregnancy and fetal age were determined by transrectal ultrasonography on day 58 and 120 using an Aloka 500V ultrasound with a 5 MHz linear probe (Aloka, Wallingford, CT). Five CIDR treated cows and 3 control cows lost ear tags during the breeding season and were therefore removed from the analysis.

Differences between treatments in the percentage of animals pregnant on day 7, 14, 21, and 28 of the breeding season were analyzed using chi-square analysis in SAS (Proc Freq). Differences between treatments in the day of conception were determined by analysis of variance in SAS (Proc GLM). When the F statistic was significant ($P < 0.05$), mean separation was performed using least significant differences (Means \pm SEM).

Results and Discussion

In the present study there was a tendency ($P = 0.08$) for a greater percentage of CIDR treated cows to have become pregnant during the first 14 days of the breeding season compared to control cows (Figure 1). When pregnancy was determined on day 58 of the breeding season CIDR treated cows tended ($P = 0.08$) to be bred earlier compared to control cows (45 days vs. 43 days, respectively). When CIDRs were used in anestrus postpartum cows, a greater percentage of CIDR-treated cows had exhibited standing estrus on day 2 after CIDR removal compared with control-treated cows, but beginning on day 14 after CIDR removal no significant difference was detected between CIDR- and control-treated cows (Perry et al., 2004). Furthermore, the percentage of CIDR-treated cows that ovulated was greater than the percentage of control-treated cows that ovulated beginning on day 4 after CIDR removal, but beginning on day 18 after CIDR removal, the cumulative percentage of CIDR- and control-treated cows that had ovulated did not differ (Perry et al., 2004).

By day 21 and 28 of the breeding season a similar percentage ($P > 0.35$) of CIDR treated and control cows had become pregnant (Figure 1). Since the bovine estrous cycle is 21 days, beginning on day 21 of the breeding season all cows that had begun estrous cycles have had one opportunity for become pregnant. Therefore, the greatest benefit of estrous synchronization with natural service is likely the ability to get more cows pregnant during the first few days of the breeding season. Cows that exhibit estrus early in the breeding season may have additional chances to conceive during a defined breeding season. During a 65-day breeding season, cows that cycle naturally have only three chances to conceive, but cows that are synchronized and show estrus the first few days of the breeding season have an additional chance to conceive. However, in the present study, this did not result in greater breeding season pregnancy rates.

When cows are synchronized and bred by natural service, the time required to detect estrus is not a concern, since the bull will be detecting the cows that exhibit estrus, however management considerations should be made for the serving capacity of the bull. Healy et al., (1993) reported a tendency ($P < 0.10$) for pregnancy rates over a 28-day synchronized breeding season to be reduced when a bull to female ratio of 1:50 (77%) was used compared to a bull to female ratio of 1:16 (84%), but no difference was detected between a bull to female ratio of 1:16 and 1:25 (84% and 83%, respectively). In the present study a bull to female ratio of 1:22 was used.

Implications

Using a CIDR for 7 days before the beginning of the breeding season tended to result in more cows conceiving in the first 14 days of the breeding season and having an earlier day of conception compared to control treated cows.

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Figures

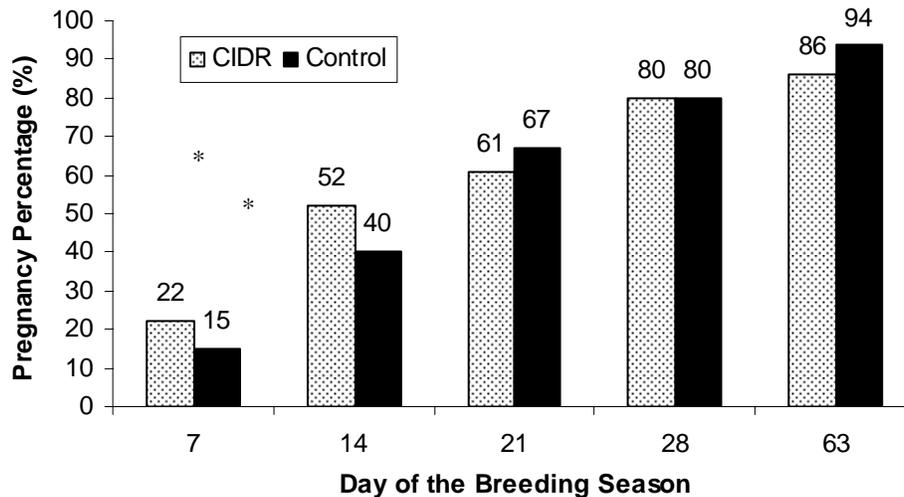


Figure 1. Effect of treatment on cumulative percentage of cows pregnant by day of the breeding season (d 0 = day bulls were introduced into the herd). * $P = 0.08$