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## GnRH removal in the 7-11 CO-Synch for timed insemination of beef heifers

### Abstract

The use of artificial insemination can improve genetics, shorten the calving season, and increase weaning weights by having more calves born earlier in the breeding season. Reasons that this technology has not been used by many producers may include poor conception rates, time, and cost. Research has been directed at shortening the synchronization time and controlling time of ovulation to eliminate estrous detection using a timed artificial insemination. Use of a progestin, like the Eazi-Breed CIDR or melengestrol acetate (MGA), is desirable because they are effective in synchronizing estrus and they can also induce cyclicity in anestrus or prepubertal females. In addition, gonadotropin releasing hormone (GnRH) is commonly included in a synchronization plan because it induces ovulation and synchronizes follicular development. The most common synchronization protocol for beef heifers consists of feeding MGA for 14 days, a prostaglandin injection 17 to 19 days later followed by five days of heat detection for a total duration of 36 to 38 days. Recent research suggests that acceptable conception rates can be achieved when shortening the time of MGA to seven days. One example is the 7-11 CO-Synch which is comprised of seven days of MGA feeding followed by the CO-Synch protocol starting on day 11 (see Figure 1). We have obtained greater than 60% conception rates using the 7-11 CO-Synch in previous years. The feeding of MGA not only synchronizes the estrous cycle but provides exposure to a progestin that may induce prepubertal heifers to begin cycling. The GnRH injection at day 11 should synchronize the follicular wave which will tighten the timing of ovulation and improve timed insemination conception rates. The disadvantage to this synchronization protocol is that it requires the heifers to go through the chute four times. It is also believed that heifers are less responsive to GnRH than cows. Thus we tested this protocol with or without the day 11 GnRH injection on conception rates of beef heifers.

### Keywords

Cattlemen's Day, 2007; Kansas Agricultural Experiment Station contribution; no. 07-179-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 978; Beef; Cattle; A.I.; MGA; 7-11 CO-Synch

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## **GnRH REMOVAL IN THE 7-11 CO-SYNCH FOR TIMED INSEMINATION OF BEEF HEIFERS**

*D. R. Eborn and D. M. Grieger*

### **Introduction**

The use of artificial insemination can improve genetics, shorten the calving season, and increase weaning weights by having more calves born earlier in the breeding season. Reasons that this technology has not been used by many producers may include poor conception rates, time, and cost. Research has been directed at shortening the synchronization time and controlling time of ovulation to eliminate estrous detection using a timed artificial insemination.

Use of a progestin, like the Eazi-Breed CIDR<sup>1</sup> or melengestrol acetate (MGA), is desirable because they are effective in synchronizing estrus and they can also induce cyclicity in anestrus or prepubertal females. In addition, gonadotropin releasing hormone (GnRH) is commonly included in a synchronization plan because it induces ovulation and synchronizes follicular development.

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### **Experimental Procedures**

Two groups of yearling heifers (n=107) from the Kansas State University Purebred Unit and the Cow-Calf Unit were used in this study. Heifers were randomly assigned to one of two treatments; GnRH or control. Heifers were group fed to consume 0.5 mg/heifer/day of MGA (Pharmacia Animal Health, Kalamazoo, MI) in a grain sorghum carrier beginning on day one. On the last day of feeding (day seven), heifers were injected with ProstaMate (5 c.c. dose, intramuscular); (IVX Animal Health, St. Joseph MO). On day 11, heifers in the GnRH treatment group received 2 c.c. (intramuscular) of OvaCyst (IVX). On day 18,

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<sup>1</sup>Eazi-Breed CIDR is a registered trademark of Pharmacia Animal Health.

all heifers received an injection of ProstaMate. Timed insemination followed 54 hours later at which time heifers were injected with Ova-Cyst. Purebred heifers were rebred after observed estrus for 45 days after the first insemination. Cleanup bulls were introduced to the commercial heifers seven days after insemination. Conception rate to the first insemination was determined by ultrasonography 31 days after insemination. Purebred heifers were checked again by ultrasound 40 days following the initial pregnancy check. Commercial heifers were pregnancy diagnosed by rectal palpation in the fall where fetal age was estimated.

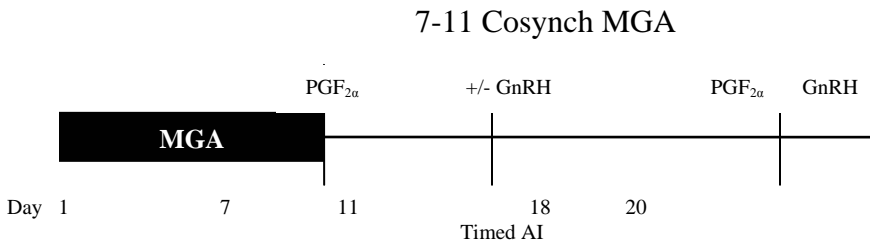
### Results and Discussion

Overall, 62 of 107 (58%) heifers conceived to the first insemination. Treatment

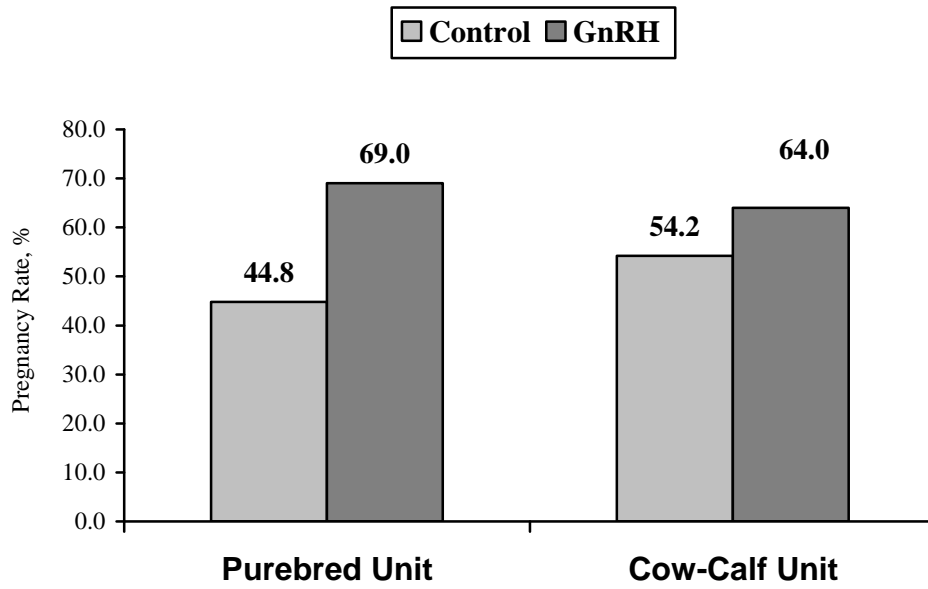
differences between the GnRH and control groups in pregnancy rate were 36 of 54 (67%) and 26 of 53 (49%) respectively ( $P = 0.08$ ). Treatment effects within herd are shown in Figure 2. Pregnancy rates for the purebred heifers in the control group were 45% (13/29) and in the GnRH group were 69% (20/29). For the commercial heifers pregnancy rates were 54% (13/24) and 64% (16/25) for the control and GnRH treatments, respectively. By 30 days after the beginning of the breeding season 73% of the commercial heifers and 79% of the purebred heifers were pregnant.

### Implications

When using the 7-11 CO-Synch protocol, the use of GnRH at day 11 appears to improve conception rates to a fixed time insemination.



**Figure 1. Experimental Protocol.** Heifers in the GnRH treatment group received an injection of GnRH on day 11 of the protocol.



**Figure 2. Treatment Effect on Pregnancy Rates of Heifers within Group.**