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Synchronizing Cattle Using Progesterone Infused Vaginal Inserts

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Background

Being able to control and influence when cattle show estrus and are able to be bred can be a key management tool to cattle producers. Historical data suggest that calves sold in uniform lots (i.e., same age, similar weight, size, and color) received more per pound than non-uniform lots. Synchronization allows producers to influence the reproductive performance and uniformity of their calf crop. Additionally, synchronization reduces labor associated with calving and facilitates the use of artificial insemination (AI) to bulls with genetically superior traits (i.e., calving ease, growth, carcass quality or maternal).

There are many synchronization programs available that manipulate the female's reproductive system using three basic classes of drugs. These include prostaglandin ($PGF_{2\alpha}$), gonadotropin-releasing hormone (GnRH), and progesterone.

Progesterone maintains pregnancy and is produced from tissue remaining on the ovary after ovulation called a corpus luteum (CL), and later, by the pregnant uterus. Cattle receiving progesterone will act – hormonally – like they are pregnant and not cycle. Follicles will progress to a certain stage without progressing through to ovulation.

The Food and Drug Administration (FDA) approved a removable plastic progesterone vaginal insert. The manufacturer calls it a *controlled internal drug release* (CIDR®, Pfizer Animal Health, New York, NY) vaginal insert. The plastic insert is impregnated with progesterone and designed to continuously release progesterone once inserted vaginally. The CIDR® has proven to be an effective method in synchronizing heifers, and can be used in cow-calf operations to provide synchronized timed-AI conceptions rates greater than 60 percent (Table 1).

CIDR® Programs

There are two common programs used in combination with CIDR®. These are commonly referred to either the 5 day CO-Synch + CIDR or CIDR Select. Both programs require a CIDR® insert, GnRH, and $PGF_{2\alpha}$ at differing time periods. Each program requires cattle to be handled at least five times. Facilities should be adequate enough to insert and remove the CIDR® and administer injections.

CIDR Select (Figure 1): This program involves inserting a CIDR® on day 0 with removal of the vaginal device 14 days later (day 14). On day 23 (9 days after CIDR® removal), a GnRH shot is administered. Cattle can be bred based on observed heat (if utilizing AI) for 3 days and timed AI'd at day 33 after another GnRH shot.

Table 1. Estrous response rate, conception rate, timed-AI pregnancy rate, AI pregnancy rate, and breeding season pregnancy rate for beef heifers at Heaton Land & Livestock in which estrus was synchronized with either the CIDR Select or 5 day CO-Synch + CIDR protocol.

Treatment	Estrous Rate, %[a]	Conception Rate, %[b]	Timed-AI Conception Rate, %[c]	AI Pregnancy Rate, %[d]	Breeding Season Pregnancy Rate, %[e]
CIDR Select	101/159 = 63.5%[f]	76/101 = 75.2%	36/58 = 62.1%	112/159 = 70.4%	141/153 = 92.2%
5 d CO-Synch + CIDR	85/159 = 53.5%[g]	65/85 = 76.5%	47/74 = 63.5%	112/159 = 70.4%	132/150 = 88.0%

[a] Proportion of heifers that were observed in estrus within 52 hours of PGF administration.

[b] Proportion of heifers that were detected in estrus, AI, and conceived.

[c] Proportion of heifers that were not detected in estrus, were timed-AI 72 hours following PGF, and conceived.

[d] Proportion of heifers that conceived to AI after being detected in estrus or timed-AI.

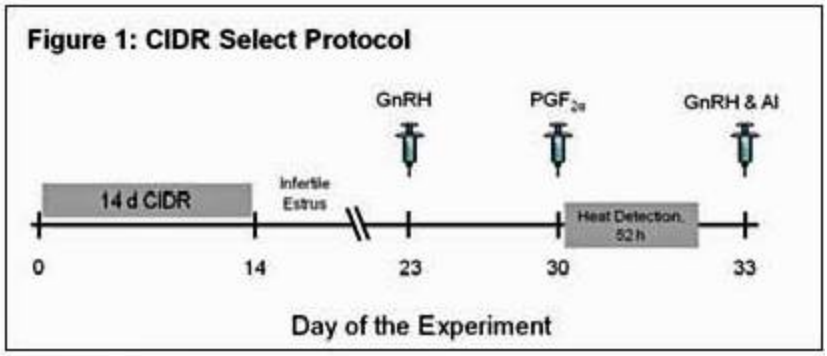
[e] Proportion of heifers pregnant at the end of the breeding season.

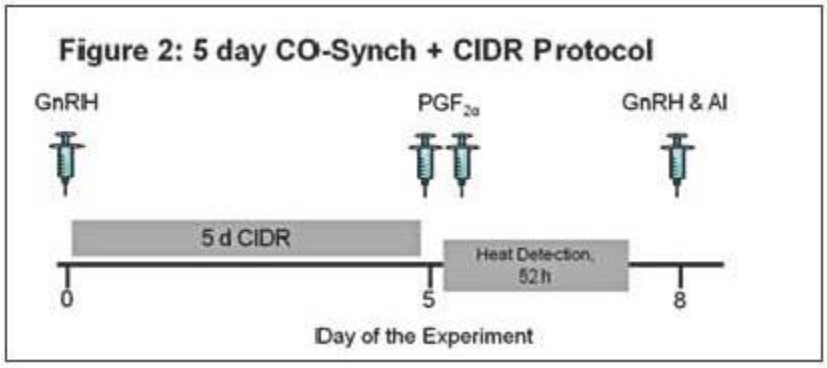
[f,g] Estrous response rate tended (P = 0.07) to be greater in the CIDR Select compared to the 5 day CO-Synch + CIDR treatment.

Table 1 adapted from *Choosing an Estrous Synchronization Program for Replacement Beef Heifers* (Bridges et al., AS-592-W).

5 day CO-Synch + CIDR (Figure 2): With this program, a GnRH injection is administered on day 0 when the CIDR® is inserted. On day 5, the CIDR® is removed and heifers receive two $PGF_{2\alpha}$ shots 12 hours apart. Animals will start to show estrus over the next 52 hours and may be AI based on observed heat. On day 8, those that did not show estrus can be given a GnRH injection and AI'd.

Both of these programs performed similarly (Table 1) when used in heifers in a recent Utah cow-calf ranch experiment by Purdue University, University of Wyoming, Utah State University Extension, and Pfizer Animal Health.





Figures 1 and 2 used with permission from *Choosing an Estrous Synchronization Program for Replacement Beef Heifers* (Bridges et al., AS-592-W).

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