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# Utilizing Fixed Timed AI for Genetic Improvement

by Clint Berry, RAAA Communications/Member Services Director

**Cattlemen across the country are constantly searching for ways to improve the quality of genetics within their herds. We have all read numerous articles over the years attempting to persuade cattlemen on the value of a superior bull. Everyone estimates that value a little bit differently, but in the end it all comes down to the fact that improving herd genetics pays.**

Some producers simply purchase the best quality bulls that their budget can afford, others look to purchase females sired by and/or bred to AI bulls. The more progressive operators might be utilizing AI or Embryo Transfer within their own herds. One thing is for sure, there has never been a time in the history of the beef industry that the potential for genetic improvement has ever been greater. There are advantages and challenges with each avenue of genetic improvement. Each producer must assess their own situation and management practices to determine the best means of achieving their goals.

The use of a successful synchronization and AI breeding program can produce tremendous benefits to producers that take advantage of the technology. Some of the benefits include improvement in animal quality gained by using the best genetics, heavier weaning weights attained by both the genetic improvement and earlier calving due to inducing estrus. Studies estimate that an average of 20% more calves are born in the first thirty days of the calving season when using AI vs. natural service. Greater uniformity of the calf crop can be realized by the shorter calving intervals and the ability to have large numbers of half siblings, improving the consistency and reliability of product. Another benefit is the ability to purchase and maintain fewer bulls, reducing costs and headaches as well.

In the past, cattlemen have been reluctant to establish a synchronization and AI breeding program due to the added labor requirement and costs associated with the program. Most of the problems arose with the number of trips an animal was required to make through the chute and the number of times the AI technician was required to visit the ranch to breed the cows. This is especially true in today's beef industry where the majority of producers hold an off the farm job in addition to their ranching operation, and the average size of the commercial cowherd is less than 36 head. Recent improvements in understanding the methods of inducing and synchronizing estrus and ovulation in beef cattle have expanded the use of AI in both purebred and commercial herds. Programs exist now that can allow cattlemen to inseminate cattle at predetermined fixed times with pregnancy rates comparable to those achieved with heat detection.

## Utilizing Fixed Timed AI for Genetic Improvement

The problem with older estrus synchronization systems was they only synchronized heat, they did not synchronize ovulation. To achieve acceptable pregnancy rates producers were required to check heats for 5 - 7 days and breed cows 12 hours later. That meant gathering cattle 2 - 3 times for synchronization and then pulling groups of cattle out of the herd to breed twice a day for 5 - 7 days. This exceeded the work load most producers were willing to accept and forced multiple trips to the ranch for the AI technician to breed small numbers of cattle. New synchronization programs have been developed and field tested in a variety of environments that allow producers to use timed insemination with excellent AI pregnancy rates. David Patterson, University of Missouri beef specialist, leads the way in researching timed AI systems. Patterson's data shows results in more than 2400 cows in 20 herds bred by timed AI without heat detection. The pregnancy rate is 65%, meaning more than 1550 cows conceived on the first day of breeding season. Success ranged from 61% - 86% among the different herds, mainly based on management practices and BCS of the cattle. The research also showed that an increased number of cattle that didn't take to the AI breeding were bred earlier in the breeding season by the clean up bull, once again providing an earlier calf in the calving season and heavier weaning weights later in the year. Another benefit to estrus synchronization is the protocols ability to stimulate some non-cycling cattle back into production.

Starting an AI program is a commitment that takes planning and preparation. Before starting the cattle must be in good nutritional and health status for acceptable conception rates to be realized, and adequate facilities to handle the additional times through the chute must be in place. Follow label directions for dose and route of administration. Consulting with your veterinarian and AI technician is always suggested.

Hormones commonly used in estrus synchronization protocols are prostaglandin F2a (PG), gonadotropin releasing hormone (GnRH) and progestins. They are available in the following commercial products. The use of a CIDR has shown to induce estrus regardless of the stage of cycle when inserted. After insertion, they release progesterone continuously, then when removed the drop in progesterone triggers estrus and ovulation.

Type	Commercial Names
GnRH	Cystorelin, Factrel, Fertagyl, OvaCyst
PG	estroPLAN, Estrumate, In-Synch, Lutalyse, ProstaMat
Progestin	MGA (melengesterol acetate), CIDR (progesterone)

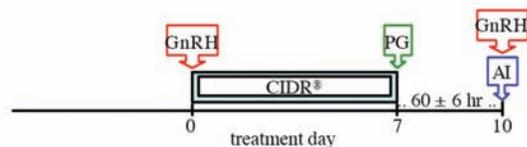
## Fixed-Time AI protocols

In fixed-time AI protocols, all animals are inseminated at a predetermined time. For cows, fixed-timed AI can produce similar pregnancy rates as protocols that require 5 to 7 days of heat detection. For heifers, pregnancy rates from current TAI protocols tend to be 5 to 10% lower than using heat detection alone. The times listed for fixed-time AI should be considered as the approximate average time of insemination. This should be based on the number of females to inseminate, labor and facilities.

The **CO-Synch + CIDR®** protocol is recommended for both cows and heifers. Cows should be inseminated between 54 and 66 hours after CIDR® removal. Insemination time for heifers is recommended at 52 to 56 hours after CIDR® removal.

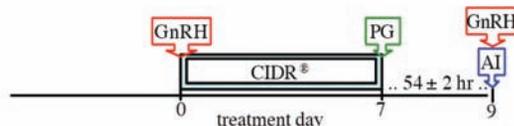
### CO-Synch + CIDR® - Cows

Perform TAI at 60 ± 6 hr after PG with GnRH at TAI.



### CO-Synch + CIDR® - Heifers

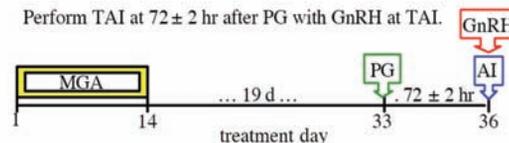
Perform TAI at 54 ± 2 hr after PG with GnRH at TAI.



**MGA®-PG** can be used with fixed-timed AI in heifers; however, pregnancy rate will likely be lower than with the CO-Synch + CIDR® protocol. For most producers CO-Synch + CIDR® would be a lower risk protocol for fixed-timed AI than MGA®-PG as it is not reliant on accurate, daily MGA® consumption and control of follicular growth should be better.

### MGA®-PG

Perform TAI at 72 ± 2 hr after PG with GnRH at TAI.



Through the use of these new synchronization protocols, cattlemen can realize the added benefits of utilizing AI breeding in their programs to greatly enhance the quality of genetics in their herds. It is now cost effective to use and reasonable to expect good results from incorporating timed AI breeding. This allows a majority of producers to add greater value to their calf crops and replacement heifers, multiplying superior genetics at a much faster rate than once realized. ■