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Using MGA[®] to Shorten the Beef Breeding Season

Overview

The flexibility in matching specific synchronization methods with the particular management system involved is one of the major advantages of using MGA to control estrous cycles of cattle.

Before implementing any estrus synchronization program, remember that most failures occur when treated females fail to reach puberty or resume normal estrous cycles after calving. Estrus synchronization should not be used as a crutch for poor management. However, when administered appropriately, estrus synchronization is an effective management tool that can be used to facilitate artificial insemination, increase weight and uniformity of calves at weaning, and ultimately improve profitability of the cow-calf enterprise.

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Modified conventional synchronization systems for beef cows boost fertility and increase the total number of females that can be inseminated.

The beef cattle industry has seen rapid gains in economically desirable traits, largely due to the selection of genetically superior males and increased use of artificial insemination. Recent surveys indicate, however, that less than 5 percent of the beef cows in the United States are bred by artificial insemination (AI), and only half of the cattle producers who practice AI use any form of estrus synchronization to facilitate their AI programs.

The inability to predict time of estrus for individual cows or heifers in a group often makes it impractical to use artificial insemination because of the labor required for detection of estrus. Available procedures to control the estrous cycle of the cow can improve reproductive rates and speed up genetic progress. These procedures include synchronization of estrus in cycling females, and induction of estrus accompanied by ovulation in heifers that have not yet reached puberty or among cows that have not returned to estrus after calving.

There are several advantages to a successful estrus synchronization program:

- Cows or heifers are in estrus during a predictable interval, which allows for artificial insemination, embryo transfer, or other planned reproductive techniques.
- The time required to detect estrus is reduced, which in turn decreases labor expense associated with the breeding program.
- Cattle will conceive earlier during the breeding period.
- Calves will be older and weigh more at weaning.

As an example, consider what happens during a restricted breeding season. If females are cycling when an estrus synchronization treatment is implemented and they exhibit estrus during the synchronized period, they would have three opportunities to conceive during a 45-day breeding period or four opportunities during a 63-day period. This compares with only two or three opportunities for nonsynchronized females, based on the average 21-day estrous cycle for the cow.

To avoid problems when using estrus synchronization, females should be selected for a program when the following conditions are met:

- Adequate time has elapsed between calving and the time synchronization treatments are implemented (a minimum of 40 days postpartum at the beginning of treatment is suggested).
- Cows are in average or above-average body condition (scores of at least 5 on a scale from 1 to 9). See Missouri publication G2230, *Body Condition Scoring of Beef and Dairy Animals*.
- Cows experience minimal calving problems.
- Replacement heifers are developed to prebreeding target weights that represent at least 65 percent of their projected mature weight.

- Reproductive tract scores (RTS) are assigned to heifers no more than two weeks before a synchronization treatment begins (scores of 3 or higher on a scale of 1 to 5) and at least 50 percent of the heifers are assigned a score of 4 or better.

At present, there are three approaches to estrus synchronization: (1) use of prostaglandins, (2) use of a combination of a progesterone-like compound with a prostaglandin, and (3) use of GnRH and prostaglandin.

This publication reviews recently developed methods using MGA to control estrous cycles of cows or heifers in breeding programs with either natural service or artificial insemination. Four methods will be outlined for using the melengestrol acetate (MGA[®] Premix, Pharmacia Animal Health, Kalamazoo, Mich.) program to facilitate estrus synchronization in heifers or cows. The choice of which system to use depends largely on a producer's goals.

The MGA Program

Melengestrol acetate is the common denominator in each of the systems presented here. MGA is an orally active progestin. When consumed by cows or heifers on a daily basis, MGA will suppress estrus and prevent ovulation.

MGA may be fed with grain or a protein carrier and either top-dressed onto other feed or batch mixed with larger quantities of feed. MGA is fed at a rate of 0.5 mg/animal/day. The duration of feeding may vary between protocols, but the level of feeding is consistent and critical to success. Animals that fail to consume the required amount of MGA on a daily basis may prematurely return to estrus during the feeding period. This can be expected to reduce the synchronization response. Therefore, adequate bunk space should be provided so that all animals may consume feed simultaneously.

Animals should be observed for behavioral signs of estrus each day of the feeding period. This may be done as animals approach the feeding area and before feed distribution. This practice will ensure that all females receive adequate intake.

Cows and heifers will exhibit estrus beginning 48 hours after MGA withdrawal, and this may continue for 6 to 7 days. It is generally recommended that females exhibiting estrus during this period not be inseminated or exposed to natural service because of the reduced fertility females experience at the first heat after MGA withdrawal.

Method 1: MGA with natural service

The simplest method involves using bulls to breed synchronized groups of females. This practice is especially useful in helping producers make a transition from natural service to artificial insemination. In this process, cows or heifers receive the normal 14-day feeding of MGA and are then exposed to fertile bulls about 10 days after MGA withdrawal (Figure 1).

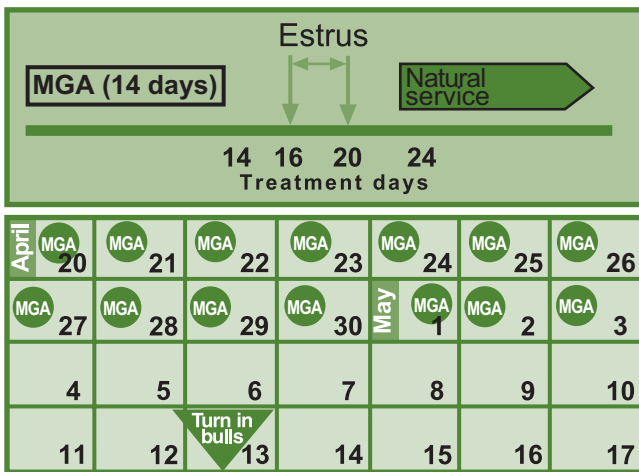


Figure 1. The simplest MGA breeding program depends on using MGA alone for 14 days, followed by natural service.

No more than 15 to 20 synchronized females should be exposed to a single bull. Producers using this program must be sure to consider age and breeding condition of the bull and results of breeding soundness examinations.

Method 2: MGA + prostaglandin

A more precise means of estrous cycle control involves the combination of MGA with a prostaglandin. Prostaglandins (PG) are luteolytic compounds normally secreted by the uterus of the cow. Prostaglandins can induce luteal regression but cannot inhibit ovulation. When prostaglandins are administered in the presence of a functional corpus luteum during days 6 to 16 of the estrous cycle, premature regression of the corpus luteum begins and the cow returns to estrus. Figure 2 depicts these hormonal changes.

In this program, prostaglandin should be administered 19 days after the last day of MGA feeding. This treatment places all animals in the late luteal stage of the estrous cycle at the time of injection, which shortens the synchronized period and maximizes the conception rate (Figure 3). Although a 19-day interval appears optimal,

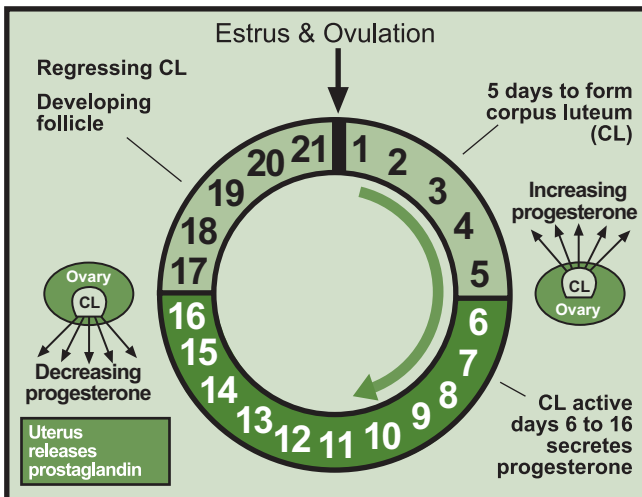


Figure 2. Physiology of the estrous cycle.

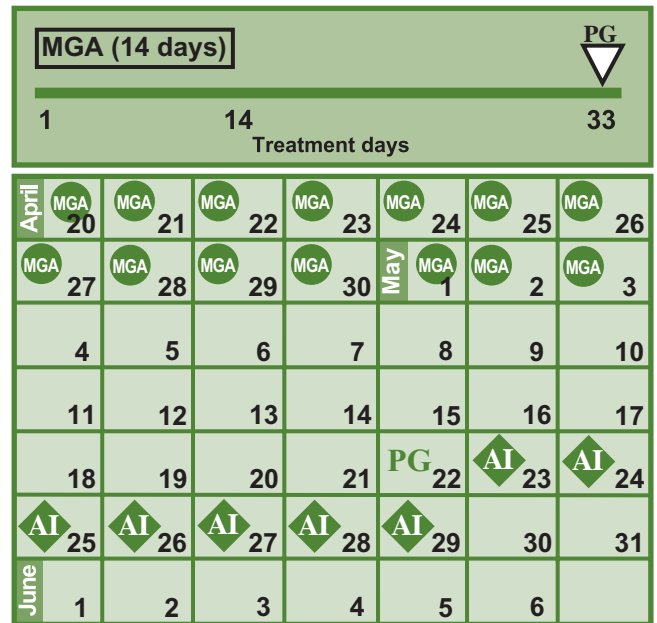


Figure 3. MGA + prostaglandin.

17- to 19-day intervals produce acceptable results and provide flexibility for extenuating circumstances.

Four available prostaglandin products for synchronization of estrus in cattle can be used after the MGA treatment: Lutalyse[®], ProstaMate[®], InSynch[®], or Estrumate[®]. Label-approved dosages differ with each of these products; carefully read and follow directions for proper administration before their use.

Figure 4 shows differences in the distribution of estrus under two estrus synchronization programs — MGA alone versus MGA + prostaglandin. The MGA + prostaglandin program is best suited for use with artificial insemination because it concentrates estrus activity and reduces the labor expenses associated with the breeding program. Furthermore, it decreases the amount of time required for estrus detection. Under natural mating conditions, however, there is an advantage in distributing estrus over several days with MGA alone to avoid overworking or semen depletion in herd bulls.

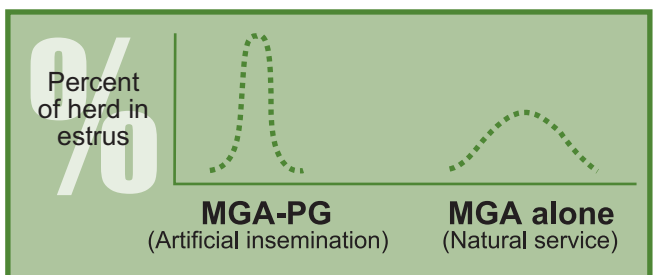


Figure 4. MGA in combination with prostaglandin concentrates estrus activity in a herd and facilitates artificial insemination.

Method 3: MGA[®] Select

The MGA[®] Select treatment is useful in maximizing estrus response and reproductive performance in postpartum beef cows. The MGA[®] Select protocol is a

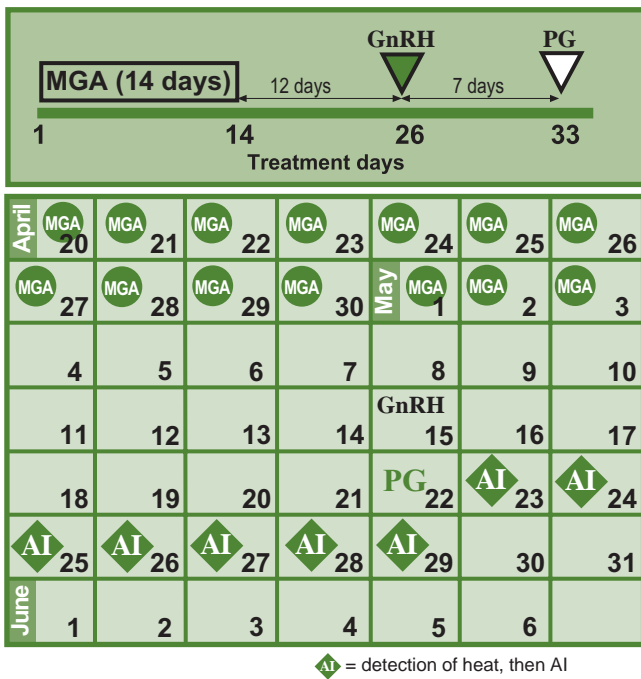


Figure 5. By incorporating both prostaglandin and GnRH, the MGA® Select program improves synchrony in postpartum cows.

simple program that involves feeding MGA for 14 days followed by an injection of GnRH (Cystorelin®, Factrel®, or Fertagyl®) on day 26 and an injection of prostaglandin on day 33 (Figure 5). The addition of GnRH to the 14–19 day MGA + prostaglandin protocol improves synchrony of estrus, while maintaining high fertility in postpartum beef cows.

Method 4: 7-11 Synch

7-11 Synch is a recently developed estrus synchronization program that (1) shortens the feeding period of MGA without compromising fertility, and (2) improves synchrony of estrus by synchronizing development and ovulation of follicles from the first wave of development. The program calls for feeding MGA for 7 days and administering prostaglandin on the last day of MGA feeding. Cows receive an injection of GnRH 4 days after PG and a second injection of PG 7 days after GnRH (see Figure 6).

Additional considerations

An additional consideration for Methods 2, 3 and 4 pertains to cows or heifers that fail to exhibit estrus after the last prostaglandin injection. In this case, cows or heifers would be re-injected with prostaglandin 11 to 14 days after the last injection of prostaglandin was administered. These females would then be observed for signs of behavioral estrus for an additional 7 days. This procedure would maximize efforts to inseminate as many females within the first 2 weeks of the breeding period as possible. Cows that were inseminated during the first synchronized period should not be re-injected with prostaglandin.

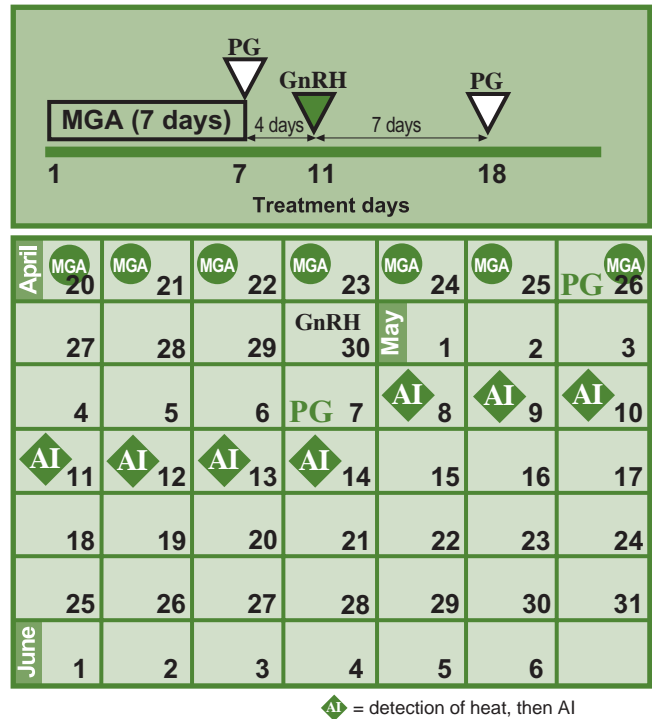


Figure 6. The 7-11 Synch program is shorter than MGA® Select.

Summary

- Method 1: Suggested for heifers and cows.
- Method 2: Suggested for heifers and cows.
- Method 3: Suggested for cows.
- Method 4: Suggested for cows.
- The decision to use Methods 3 or 4 in heifers should be based on careful consideration of the heifer's age, weight and pubertal status.
- Research conducted at the University of Missouri involved the use of Lutalyse® Sterile Solution and Cystorelin® in development of Methods 3 and 4.

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