
ESTROUS SYNCHRONIZATION

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Estrus synchronization (ES) programs have been available for the past 25 years and have enjoyed success as a tool to make artificial insemination more practical. A number of products and protocols are available and all have advantages and disadvantages. All synchronization programs require good management, cows having regular estrous cycles, and in good body condition (more than body condition score of 4). With attention to detail and adequate feed, these programs can work well. However, please recognize at times that failures in synchronization and artificial insemination do occur for known and unknown causes!

Artificial insemination is a reproductive tool that has been used for some time, especially by seedstock producers and the dairy industry. Recently, the use of AI by commercial producers has increased with improvements in estrus synchronization and “timed insemination”. For most producers, benefits of AI outweigh the negatives. Let’s discuss the negatives first. Efficiency of AI (i.e., pregnancy rates) is highly related to experience and technique. Artificial insemination is not a difficult technique to learn but requires practice for one to become proficient. One should not plan on learning AI in a short time period, going home and having pregnancy rates of 60% when breeding on detected heat. Learn the technique at an AI school, then go home and practice. Unfortunately, the practice will come at the expense of low pregnancy rates in the beginning. But this should improve over time with practice and experience.

The benefits of AI include the improvement in the genetic base of your cowherd. Very few of us can afford to buy the top bulls and take them home to breed a few cows. However, we can buy semen from these bulls from our various semen representatives, store it in a semen tank, and then use it at our convenience. This semen from these top bulls will result in calves with heavier weaning weights and heifers with improved genetics. A word of caution must be included here related to performance of the calves. Using top bulls and/or semen over several years will result in a cowherd of excellent genetic potential, with performance limited only by management of nutrient availability. In other words: “no feed” equals “no growth” no matter how good the genetic base of your cowherd!

Now let’s talk about estrus synchronization. Basically, estrus synchronization involves the use of one or more hormones to bring cows into heat within a short time period (36 to 96 hours). New methods are being researched and developed daily for improving our ability to synchronize heat and/or result in timed insemination without heat detection. Also, a lot of attention has been focused on Select Synch, Ov Synch, Co Synch, and Modified Select Synch. These “Synch” protocols involve a combination of two hormones: GnRH and Prostaglandin $F_{2\alpha}$. These two hormones, given a week apart depending on the protocol, result in excellent synchronization of

heat, adequate pregnancy rates, and offer the opportunity for timed insemination with Ov Synch and Co Synch.

Now what are the limitations of estrus synchronization (and AI)? One would be the labor (time) involved with synchronization, heat detection and AI compared to opening the gate and letting the bull into the pasture. Another limitation is that they do not work all the time as stated above. This failure is usually associated with nutritional status of the cowherd, lack of estrous activity and anything else we can think of at the time. Another limitation would be the cost of the hormones involved in synchronization and the requirement that they be purchased from a veterinarian (do you have a good working relationship with your veterinarian?). Another would be the cost of semen and an AI technician (if needed) versus the cost of a bull (a self-trained breeding technician). This leads to another problem: availability of AI technicians or AI training. Ask your semen representatives or extension agent for help in locating a technician or a training school. Often, the technicians may be the semen representative themselves or a local dairy producer who will assist you. One other point, avoid using estrus synchronization with bull matings (i.e., natural service) unless you have plenty of “bull power”. With synchronization, several cows would be in heat at one time, resulting in cows not getting bred or being bred infrequently by the bull. This approach has been used with success but we recommend caution without adequate “bull power”.

The benefits of estrus synchronization and AI together include improved genetics and performance, more uniformity in calving and weaning (thus uniformity in marketing), less time spent on observing heifers (and cows) for calving problems, and being able to vaccinate the cowherd at the proper time periods (instead of small groups throughout the year) as describe below:

Advantages of Estrus Synchronization include:

- Earlier and more concentrated calving
- Uniformity of calves at weaning
- Use of improved genetics for producing a value-added product
- Less time for estrus (heat) detection

Disadvantages of Estrus Synchronization include:

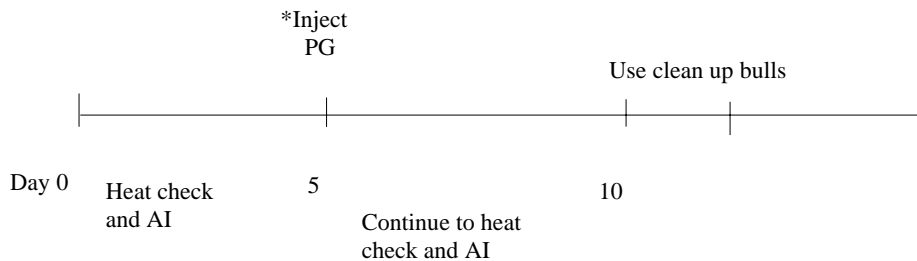
- Drug expense and labor
- An existing high level of management is required
- Good handling facilities are required
- Cows must be cycling and in good body condition
- You can only synchronize the number of cows you can inseminate at one time

Estrous Synchronization Using Prostaglandins

The hormone, prostaglandin (PG), was the first available for estrous synchronization. Prostaglandin systems work equally well for cows or heifers. At least three products are commercially available, all by prescription and all seem to work well. Cows **must be cycling** for PG to have any effect. Prostaglandins are not generally recommended for timed insemination without the use of other hormones.

One Injection Prostaglandin System

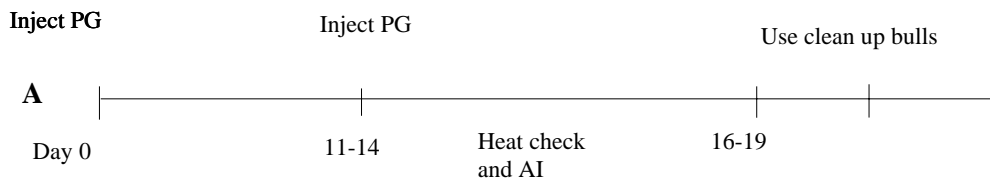
This system is used where heat detection is practiced, and drug costs are a concern. If less than 3% of cows can be found in heat per day before injection, abandon the idea. Sixty to seventy percent of cows will be bred AI using this system.

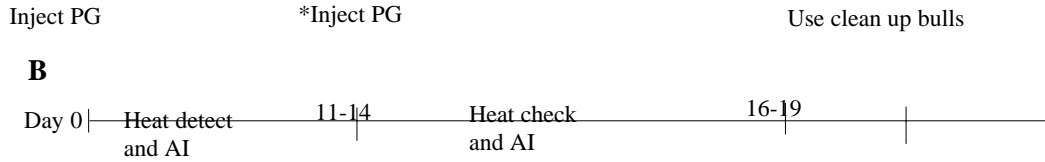


*inject PG to animals not observed in estrus and bred during the previous 5 days

Two Injection Prostaglandin System

This system, (A) is used to bring more cows in heat during the AI period (90%). Heat detection must be practiced. If extended heat detection is not a concern but drug costs are a problem, then animals can be heat checked and bred after the first injection of PG (B). Animals not showing heat following the first injection would then be administered a second *PG injection 11-14 days later and then bred.



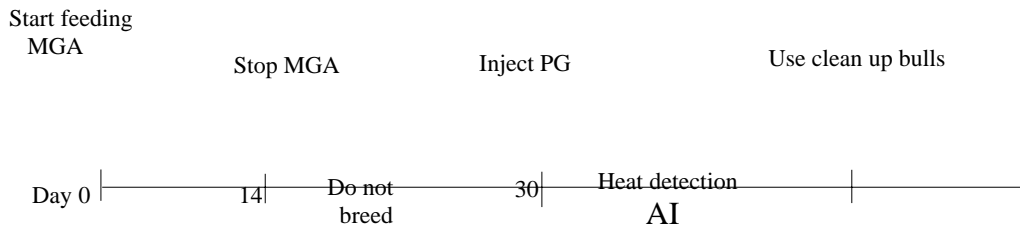


Estrus Synchronization Using Progestogen's

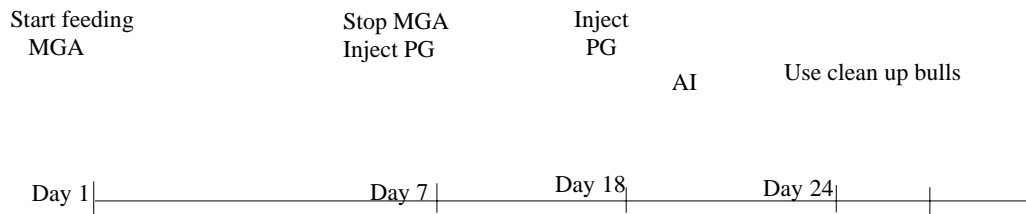
Progesterone-like compounds have been frequently tried over the years as a method of estrus synchronization. Two have been commercially available.

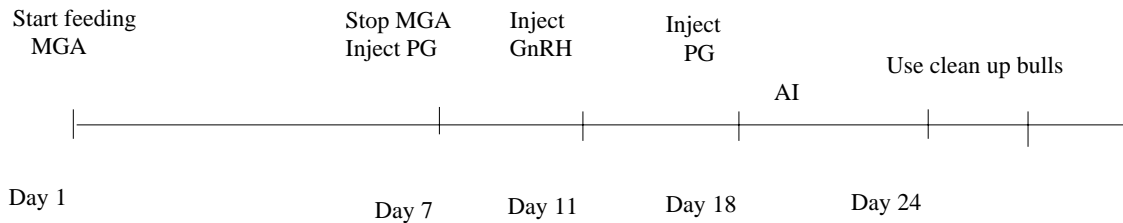
Estrous Synchronization Using MGA & PG

The synthetic progesterone, MGA, has been used with prostaglandins for synchronization. This protocol takes advanced planning and requires bunk feeding. This program works best with larger groups of heifers that are already fed grain and where heat detection is practiced. Animals will show heat after MGA feeding is stopped, but their fertility is reduced (<20% pregnancy rate). **These animals should not be bred.**



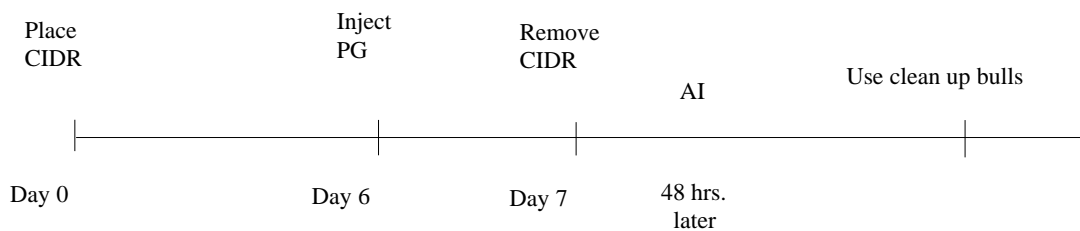
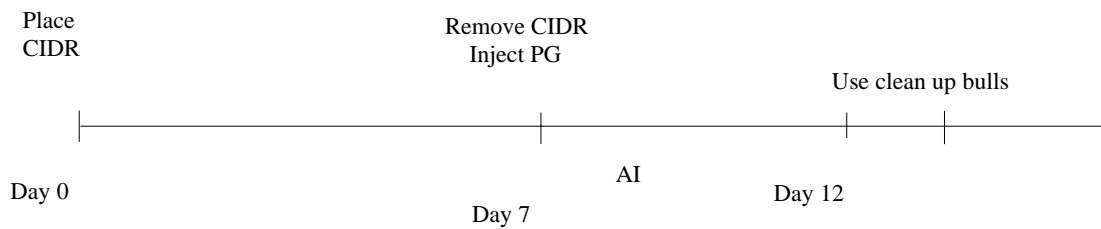
7-11 Programs





Estrous Synchronization Using A CIDR

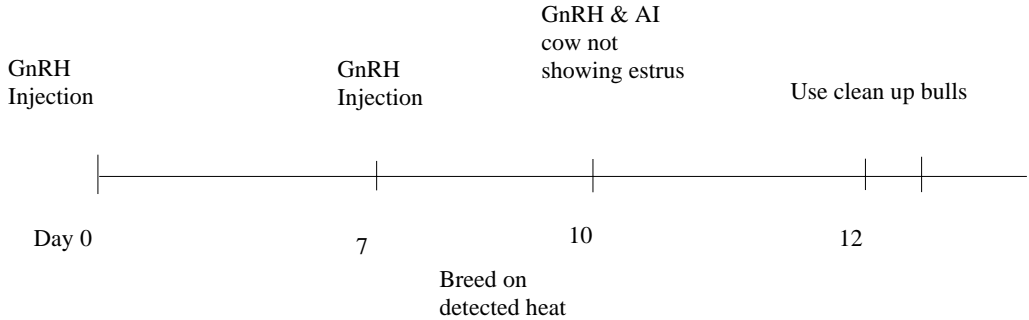
A progesterone-containing device which is inserted into the cows vagina has become commercially available. This CIDR appears to offer some advantages due to ease of insertion and removal.



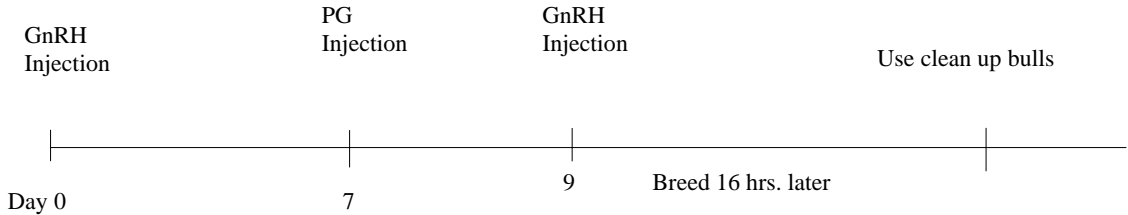
Estrous Synchronization Using GnRH

Recently, the hormones GnRH and prostaglandins have been used together for estrous synchronization. **These programs can only be used on cows**, but can be used on dairy cows. The effectiveness of these programs in heifers is being researched. Timed breeding results in pregnancy rates similar to other timed breeding programs (40%-60%).

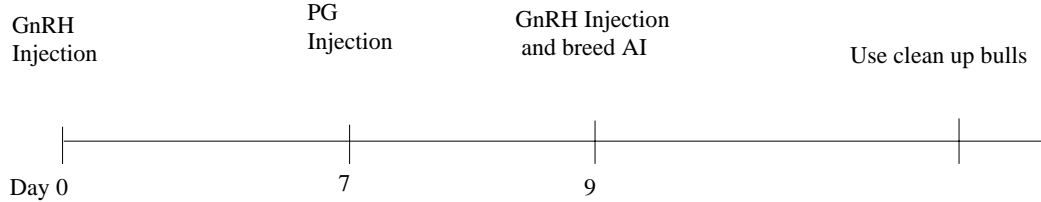
Select-Synch Program



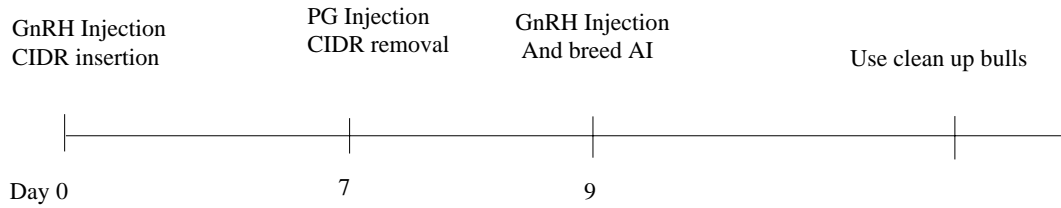
Ov-Synch Program



Co-Synch Program



Co-Synch plus CIDR Program



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Summary

All the estrous synchronization systems discussed have advantages and disadvantages. The most essential requirements for estrous synchronization are good management and having cows in good body condition. Attention to detail is a necessity for proper use and successful synchronization and pregnancy.