

A REPRODUCTIVE MOMENT WITH MEL

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Can Breeding Cows Get More Complicated?

Maintaining a sound heat-detection program and quality heat-detection personnel can be a never-ending challenge in today's expanding herds. However, as the accuracy and efficiency of estrus detection declines, the value of incorporating estrus synchronization into the reproductive management program increases proportionately.

It is easy to feel overwhelmed and confused by the variety of estrus-synchronization protocols available. On the other hand, this variety provides extraordinary flexibility in developing tailor-made reproductive management programs. Let's start with the basics, and discuss how and why these protocols were developed. Once you understand them, they may appear less complicated, and perhaps you'll find the system that best fits your management approach.

THE BASICS

It is possible to maintain good reproductive performance in dairy cows without estrus synchronization, but this requires SOUND HEAT DETECTION.

The foundation of any dairy cow synchronization protocol is prostaglandin F_{2a} (PGF). PGF brings cows into heat by destroying the corpus luteum (CL). The CL is a structure on one ovary of cycling animals that prevents them from coming into heat by producing the hormone, progesterone. By destroying the CL, PGF removes progesterone, allowing the animal to return to estrus.

The use of PGF alone does have limitations:

1) PGF is not effective in animals that do not have a CL. This includes animals in the early stages of the estrus cycle (Days 1 to 7) and anestrous animals that have not resumed normal cyclic activity after calving.

2) PGF has no effect on follicular waves. Follicles are blister-like structures on the ovary that con-

tain the unfertilized egg. Because follicles continually grow and regress in a wave-like pattern throughout the estrus cycle, there is considerable cow-to-cow variation in the size of the largest (dominant) follicle at the time of PGF injection, and, consequently, variation in the time interval from PGF injection to estrus.

Injecting a group of cows with PGF alone is like firing the starting gun for a race before the runners are lined up. Some still may be in the locker room (anestrous and early cycle cows). Large follicles starting closest to the finish line will come into heat first (24 to 48 hours later), while small follicles have further to go before they are large enough to ovulate (four to six days). That's why fixed-time A.I. following use of PGF alone seldom produces acceptable results.

However, PGF alone is a very effective management tool *if* most cows are cycling *and* the heat-detection program is intense enough to catch animals as they respond.

ADDING GNRH

To improve the synchrony of estrus following PGF, follicles must be assembled at the "starting line" before the race. Gonadotrophin-releasing hormone (GnRH) given seven days before a PGF injection removes most large follicles on the ovaries. Cows then start growing new follicles at the same time — yielding follicles of a similar size when the race begins with a PGF injection seven days later. This results in a more consistent start and synchronous finish to the ovulatory race. GnRH also will induce many anestrous cows to start cycling, and get them out of the locker room and onto the track in time to race.

A GnRH-PGF follicle race may end in several

ways.

Traditionally, the race continues until all participants cross the finish line. This is analogous to SELECT SYNCH, where animals are inseminated only as they are detected in estrus during the next five days. This system requires close monitoring of the finish line (good heat detection) to ensure that the right trophy goes to the right participant at the right time.

An alternative is to put a time limit on the race (OVSYNCH) — 48 hours after the PGF starting gun, the race is declared to be over by giving a second GnRH injection to force ovulation of the newly recruited follicles. All participants receive a consolation prize (fixed-time A.I.) 16 to 18 hours later. With the OVSYNCH system, winners and losers are not determined by who finished first or last, but rather by who happens to cross the finish line at the just the right time (ovulation coinciding with fixed-time A.I.).

A HYBRID SOLUTION

A third way to end the GnRH-PGF race is using a combination of these two methods, which is called the Hybrid system. The worthy winners (animals that display estrus) are given optimal opportunity to conceive by inseminating to detected estrus within 72 hours following the PGF injection. At 72 hours, most of the winners (cycling

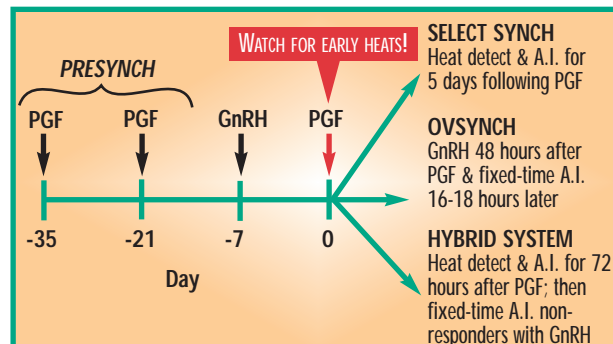


Figure 1. Dairy producers can customize a synchronization program to fit their needs by choosing from the listing of GnRH/PGF based programs above.