Western Dairy News
for the West, about the West, from the West
October 2007
Volume 7, No. 9

Understanding sncronization programs

By Ellen Jordan, Ph.D.
Professor & Exten. Dairy Specialist
Texas Cooperative Extension
The Texas A&M University System

Reproductive inefficiency continues to plague dairy producers across the nation. For many years the biggest impediment to A.I. programs was finding cows in estrus. Over the last 10 years reproduction programs have been revolutionized by the development and adoption of estrus synchronization programs such as Ovsynch.

Initially, many producers used these programs to insure that problem cows were inseminated. Recently, more and more producers are using synchronization programs for first service. Instead of identifying cows in estrus after a defined voluntary waiting period, producers now decide when to breed cows for the first time.

Ovsynch is designed to control the time of ovulation so that timed insemination can be used, minimizing the reliance on estrus detection. Research studies show conception rates are similar between cows inseminated at a fixed time following Ovsynch and those bred based on observed estrus. To obtain these same results in the field, strict adherence to tested protocols is required.

Table 1: Comparison of percent of cows conceiving and calving in an Ovsynch program when insemination occurs at varying intervals after the second GnRH treatment.

	(time after second GnRH until AI)				
	0 hrs	8 hrs	16 hrs	24 hrs	32 hrs
% conceiving	37	41	45	41	32
% calving	31	31	33	29	20

Ovsynch is based on three hormonal treatments. On day 0 cows receive GnRH (gondadotropin releasing hormone). This causes release of FSH (follicle stimulating hormone) and LH (luteinizing hormone) from the cow's pituitary gland. The LH stimulates ovulation of any dominant follicle that is present on the ovary at the time of treatment. In addition, FSH stimulates a new follicular "wave" to develop. One of the follicles from this wave then becomes dominant, growing larger than other follicles on the ovary.

On day 7 prostaglandins are used as the second treatment. The prostaglandin causes the corpus luteum to regress. Progesterone levels fall so the developing follicle can continue maturing, becoming a pre-ovulatory follicle.

The final treatment is a second dose of GnRH given 48 hours after the prostaglandin. The GnRH again causes a surge of LH to be released from the pituitary. The LH induces ovulation of the pre-ovulatory follicle, usually between 24 and 32 hours later. The remnants of the follicle then develop into a corpus luteum, which produces progesterone.

Getting the most return on your investment in a synchronization program requires exact adherence to the timing of these treatments. For example, if the final dose of GnRH is given at 24 hours instead of 48 hours, many of the follicles will be too immature to ovulate.

The initial study of Ovsynch evaluated inseminating cows at 0, 8, 16, 24 and 32 hours after the second dose of GnRH. The highest conception rate occurred at 16 hours, thus it is the recommended interval. There are slight reductions in conception rates when insemination occurs at 0, 8 or 24 hours after the second GnRH.

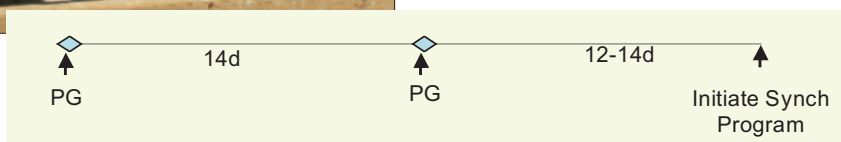

Figure 1: Variations in presynchronization programs used. (PG=prostaglandins).

Because there is only a slight reduction in fertility, some producers may elect to inseminate at one of these times to avoid the hottest part of the day or for other management reasons. Under no circumstances should the timing of inseminations be delayed to 32 hours, as conception rates are lower and pregnancy loss is increased (see Table 1). This increase in pregnancy loss means even fewer cows calve.

Research over the last 10 years indicates that although estrus synchronization proto-

Western Dairy News is a collaborative effort of Dairy Specialists from:

University of California, Davis
Cooperative Extension Washington State University
Oregon State University Extension Service
New Mexico State University
Utah State University Extension
Colorado State University — Knowledge to Go Places
K-State Research & Extension — Kansas State University
The University of Arizona Cooperative Extension — College of Agriculture and Life Sciences
Texas Cooperative Extension — The Texas A&M University System
University of Idaho Cooperative Extension System

cols such as Ovsynch can be initiated at any time during the estrus cycle, more cows conceive if it is initiated on day 5 to 12 of the estrus cycle.

Consequently, "presynch" was born to further manipulate the cow's estrus cycle. It was designed specifically to increase the number of cows in this optimum window from day 5 to 12 of the cycle. To presynch cows, two treatments of prostaglandins are given two weeks apart. Ovsynch is started 12 to 14 days after the second prostaglandin treatment (see Figure 1).

There have been at least seven different studies including nearly 1,000 cows that have evaluated the outcome of the presynchronization strategy. The results have been quite consistent. Overall the response has been roughly a 30 percent increase in the percentage of cows becoming pregnant on a weighted basis (42.1 percent pregnant on presynch compared to 32.2 percent pregnant on Ovsynch alone).

As with any synchronization program, cows must be cycling for the program to be effective. Consequently, the program will work best if you plan for cows to approach 70 days in milk at time of first insemination. The entire program from the beginning of presynch until the cow is inseminated takes 35 days. Therefore, if you want to breed cows at 70 DIM you should start a presynch program 35 days after calving.

Synchronization programs insure that every cow can be inseminated the first time within a designated window. Adding a presynch program can help you get the most from the time and money you invest in synchronizing first insemination. Whether using Ovsynch alone or in combination with presynch, best results can only be obtained by strictly adhering to protocols.

Time to winterize manure management systems

By Deanne Meyer, Ph.D.
Livestock Waste Mgmt. Specialist
University of California

Everyone's getting back into their usual routine now that children are back in school. Fall is right around the corner and winter isn't far behind. Now is the perfect time to make a few notes and winterize your manure management system before cold temperatures set in.

The manure management system can be evaluated through its various components. Some practices serve a dairy better during summer than winter months. It's important to stop, evaluate your facility, identify practices that better serve your facility in winter, and be sure these are operational and available.

Source generation: Do you (or should you) do things differently in winter months?

- Evaluate animal drinking water use, pipes, floats, and valves.
- Monitor cow cooling systems and drain water from lines if necessary.
- Evaluate parlor water use, especially water used for udder hygiene and cleaning the parlor.

Can or should any of these sources that put additional water to the waste stream be modified? Also, as part of source generation identify if any changes need to occur in bedding management. Proper attention to animal beds can result in cows arriving at the parlor in cleaner condition, thereby needing less water to prepare for milking.

In areas where cattle are housed indoors be sure ventilation systems are fully functional and they have had their regularly scheduled maintenance. Cold temperatures result trigger fewer air exchanges, resulting in greater buildup of gases in the housing system. Be sure gaseous concentrations are acceptable for animal well being as well as worker safety.

Storage: Evaluate available storage and make modifications to increase storage if land application of nutrients complies with the farm nutrient management plan. Management activities can reduce storage needs. Reduction in parlor water use and maintenance and proper operation of rain gutters with diversion spouts can result in large diversions of water from liquid storage systems. Physical inspection of storage structures (solid, liquid or slurry) is important on a regular basis. Check structures for integrity, cracking, slumping, erosion, vegetation, animal burrows, and visible seepage. Be sure liquid storage structures will not discharge to surface waters.

Perform maintenance on all pumps associated with liquid manure transfer to be sure they are in top operational condition. Evaluate ditches, drains, and perimeter berms to be sure any rain runoff is maintained, contained, and controlled on property. Allow off-site discharge **only** when it is legal to do so. Evaluate diets to be sure excessive amounts of nitrogen, phosphorus and salts are not sneaking back.

Production area runoff: Clean and relocate manure nutrients from corrals and outside pens. Grade pens to an area/location where runoff can be collected and transferred to the appropriate storage structures. Establish property berms (if necessary) to prevent uncontrolled runoff from the animal production area. Be sure all pens and feed storage areas drain to a location where nutrients (and runoff waters) can be controlled.

Land application area runoff: Evaluate history of manure application to land. Take into consideration local, state and federal restrictions on discharge of manure from land application areas to surface waters. Observe the perimeter of the property to be sure runoff from fields can be intercepted and contained if necessary. Also inspect all valves, pipes, and conveyance structures used to transfer liquid manure from storage to land application areas. Be sure low areas of the property are capable of being managed to minimize off-site discharge to surface waters.

Utilization: Land application of manure is feasible in some parts of the U.S. during winter months. This should be done in accordance with the facility nutrient management plan to maximize nutrient use by crops and minimize any potential for uncontrolled, and illegal, offsite discharge.

Paperwork: Carefully analyze any existing requirements specific to the operation as defined by a nutrient management plan or comprehensive nutrient management plan. In some areas producers are obligated to take monthly photos of their storage area. Also, in some areas producers must quantify all nutrient source distributing nitrogen or phosphorus on a field. Understand your local regulatory requirements and be sure you are able to comply with them.

Prepare for any winter sampling: Watersheds with Total Maximum Daily Load restrictions often have voluntary or mandatory sampling of storm water runoff or surface water flows during winter months. Now is the time to look again at any sampling protocols for storm water runoff. Pay attention to the type of bottle, holding time (time between when the sample was obtained and when it must begin analysis), and the analyses to be run.

Prepare for colder temperatures: It only takes one trip to the hardware store to replace broken pipes to never forget that water expands when it freezes. Now is the time to check all pipes, locate winter insulation, and identify drain valves so you're prepared when cold temperatures arrive.

Each fall dairy producers repeat the same activities prior to the onset of winter. This activity is natural as they prepare for the herd health and management changes necessary to acclimate to winter. Don't overlook your manure management system.

Western Dairy News is published as a service to people interested in the health and welfare of the Western dairy industry. Archives of this publication may be found at:
http://animalscience-extension.tamu.edu/dairy/wdn.html

For further information contact:
Dr. Ragan Adams, Editor
ILM, CSU-VTH
300 W. Drake Road
Fort Collins, CO 80523
970-297-0371
radams@lamar.colostate.edu