Ovsynch Intro Reading edited by C. Kohn, Waterford WI

***Read this article. Be prepared to discuss what it means with your group. Each group will be presenting – be prepared!***

*Source: http://www.ansci.wisc.edu/jjp1/ansci\_repro/misc/websites09/thur/Ovsynch/Ovsynch.htm*
Historical Background

Historically, poor estrus detection and poor conception rates have resulted in huge challenges in managing reproduction in most lactating dairy cow herds. In an effort to assist producers in managing reproduction in a more effective manner, synchronization protocols have been developed with the use of the hormone PGF2α. This includes efforts to create timed artificial insemination protocols to assist in estrus[[1]](#footnote-1) detection (Stevenson et. al., 1989). In the past, synchronization protocols have been effective with PGF2α when animals are bred to detected estrus (Archibald et. al., 1992; Lucy et. al., 1986). Using PGF2α allows producers to increase detection of estrus and artificial insemination management. One important limitation of these protocols has been the fact that estrus has not completely been synchronized, with animals coming into estrus over a period of several days (Lauderdale et. al., 1974).

In addition, it is important to note that conception rates are drastically reduced when cows subjected to a simple PGF2α protocol are bred to timed artificial insemination compared to breeding to a detected estrus (Archibald et. al., 1992; Lucy et. al., 1986; Stevenson et. al., 1987). Thus, a general consensus existed that after much research, there is still a necessity for a synchronization protocol that more precisely synchronizes estrus with a timed artificial insemination that allow for a reliable conception rate.

# Ovsynch Protocol and Function of Each Injection

In 1995, Pursley et. al., tested a new synchronization regimen using gonadotropin releasing hormone (GnRH) and PGF2α (used in the prior studies above). To initiate the protocol, a 100µg intramuscular injection of GnRH is administered at a random stage in the estrus cycle. This intent of this injection is to cause ovulation of a dominant follicle (and thus begin a new follicular wave) or be injected when a new follicular wave is already forming spontaneously (therefore causing the injection to essentially not affect the stage of the estrous cycle). Seven days later, a 35 mg intramuscular injection of PGF2α is administered to regress any corpus lutea present (this is the structure that releases progesterone; regressing the corpus luteum ends an ovulation cycle). The seven day interval is used so that is in fact the initial GnRH injection ovulated a follicle, then the corpus luteum would have grown to a sufficient size to be responsive to PGF2α. 48 hours later, the cows receive another 100µg intramuscular injection of GnRH to ovulate the new dominant follicle. The nine days allowed between the two injections of GnRH is designed to be sufficient for a new follicle to emerge and grow to an appropriate size to response to the GnRH. Finally, 24 hours later the cows are bred via artifial insemination. A sample protocol is shown below in Table 1. Please note that although the specific day of the week is not important, the interval between the injections is very critical to the synchronization protocol.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|   |   | GnRH |   |   |   |   |
|   |   | PGF2α |   | GnRH | A.I. |   |

# Ovsynch Conclusions & Discussion

Reproductive efficiency is dependent upon both service rate and conception rate. The Ovsynch protocol described above has many benefits, including the following:

One of the major benefits of Ovsynch is that it greatly increases the service rate in a herd of dairy cows. Instead of waiting for the cows to come into heat, all of the cows subjected to the protocol are inseminated.

In addition, all cows are typically scheduled to be bred on one day of the week in an effort to coordinate injections and artificial insemination. For example, often cows are synchronized to be bred on every Friday (Table 1 Example).

Lastly, a very important benefit is that all cows subjected to this protocol do not have to undergo heat detection. Traditionally, this is a very time-consuming process that often results in "missing" cows that are in heat. By synchronizing ovulation, heat detection is eliminated.

One important clarification is that Ovsynch does not increase conception rates, but rather increases service rate (Pursley et. al., 1997). This means that while the likelihood of getting a cow pregnant is the same once they are inseminated, the likelihood of getting the cow inseminated is much higher.

# Bibliography

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1. Estrus is the period of time when a cow can be bred by a bull or artificially. Outside of the estrus period, a cow cannot get pregnant. [↑](#footnote-ref-1)