

Industry Presentation - Tips for Optimizing Fertility in Dairy Cattle

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The 2015 Dairy Cattle Reproduction Council (**DCRC**) award winners' annual herd 21d pregnancy rate ranged from 26 – 39 % for lactating Holstein cattle. The question is “How do they achieve those pregnancy rates?”

The majority of cows in the High Plains are inseminated based off of estrous detection, which stresses the importance of having accurate estrous detection and excellent conception rates to those heats for optimal fertility. Strategies outside of hormonal manipulation, which are not discussed in this lecture but are covered by other speakers, include the importance of good management and genetics to improve postpartum health, cow comfort, body condition, etc.; which in turn allows for optimal fertility.

The response and timing to the sequential injections of hormones (i.e. gonadotropin releasing hormone (**GnRH**) and prostaglandins (**PG**)) used in the Ovsynch protocol can dramatically affect fertility.

Many commonly used synchronization programs, and the timing of the injections within the synchronization programs, were developed from research that did not utilize estrous detection. However, most herds in the High Plains use estrous detection as part of their reproduction program. Over the past several years some of the synchronization programs have been re-evaluated with estrous detection included.

Preynchronization (**Presynch**) programs based on GnRH can reduce estrous detection and PG based Presynch programs can improve estrous detection; so it is important to choose a synchronization program that maximizes estrous detection, if that is a goal of your farm. Of course that's provided you can achieve good estrous detection and conception rates.

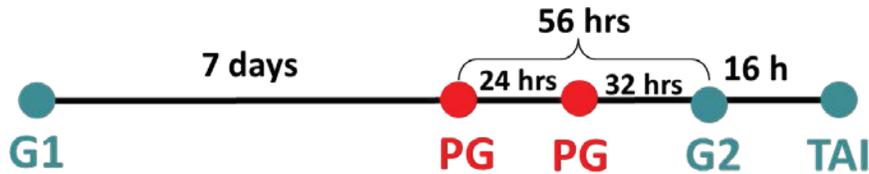
The interval between Presynch (2 injections of PG 14 d apart) and the first GnRH (**G1**) of the Ovsynch program can vary between 10 – 14 d, if utilizing good estrous detection.

Conception rates following first AI continue to be less than optimal. Using a robust resynchronization program coupled with good estrous detection can improve fertility.

Conception rates to resynchronization programs have improved 5 – 7 % with the addition of a PG injection 7 - 11 d or a GnRH injection 6 - 7 d prior to beginning Ovsynch.

Recently, studies have shown the addition of a second PG within the Ovsynch protocol can improve your herd's conception rate 3 – 6 % (Figure 1). The main benefit of the 2 PG injections is on cows that begin the Ovsynch program without a corpus luteum (**CL**). A CL is induced with the first GnRH (**G1**), which is approximately 20 – 30 % of the cows that enter the Ovsynch program. The newly formed CL will only be 6 d old at the first PG injection of the Ovsynch protocol.

Figure 1: Schematic of two PG injections in Ovsynch. (G = Gonadotropin Releasing Hormone; PG = Prostaglandin; TAI = Timed Artificial Insemination)



A 6 d old immature CL is less responsive to a PG injection, so 2 injections are necessary for complete CL regression to achieve low progesterone levels at AI and optimal fertility.

The addition of a second PG during an Ovsynch program may be more beneficial on dairies that have good estrous detection, as the *problem* cows end up in the Ovsynch program, which becomes a concentrated population of cows that are anovular (no CL). These cows will have a better response

to G1 and in turn need 2 PG injections for CL regression.

Recent research has shown that fertility to sexed semen can be improved if the timing of insemination is closer to ovulation. The ideal timing for conventional semen is 4 to 12 hr from onset of estrus to insemination. However, a recent study has shown that when using sexed semen in lactating cows the ideal timing for best fertility was 13 to 41 hr after onset of estrus as indicated by activity monitors.

RESOURCES

Visit www.dcrcouncil.org for information regarding recommended synchronization programs published by the DCRC. There are both dairy cow and dairy heifer protocols. In addition, the protocols are available in Spanish as well as English. Other resources are also available on this site for members. Their annual meeting is in Columbus, Ohio on November 10th and 11th and provides the latest information on strategies to improve dairy cattle fertility.