DRECA
DAIRY RESEARCH SUMMARY

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Timed-Artificial Insemination Programs: Is Shorter Better?

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Why is this important?

Poor or inadequate visual estrus detection is the major cause of low insemination risk (the percentage of eligible cows or heifers that are inseminated within a given timeframe, e.g. usually 21 days) and subsequent reproductive inefficiency in dairy herds.

Synchronization programs have been developed that overcome the problems and limitations associated with visual estrus detection. As a result, timed-artificial insemination (TAI) programs have become an integral part of reproductive management in many dairy herds. Seven-day long gonadotropin releasing hormone (GnRH)-based protocols (e.g. Ovsynch and Co-synch) are commonly used in Alberta (see Figure 1).

What did we do?

In an attempt to further increase ovarian response and pregnancy per AI (P/AI), we and other scientists have modified the original 7-day Ovsynch and Co-synch programs by altering the length of the protocol and testing different treatment intervals. In two studies, we compared a 5-day versus a 7-day Co-synch plus progesterone device protocol in 120 dairy heifers and a 5-day versus a 7-day Ovsynch plus progesterone device protocol in 500 dairy cows. We also examined whether the initial GnRH was necessary to achieve acceptable P/AI in a 5-day GnRH-based plus progesterone device protocol.

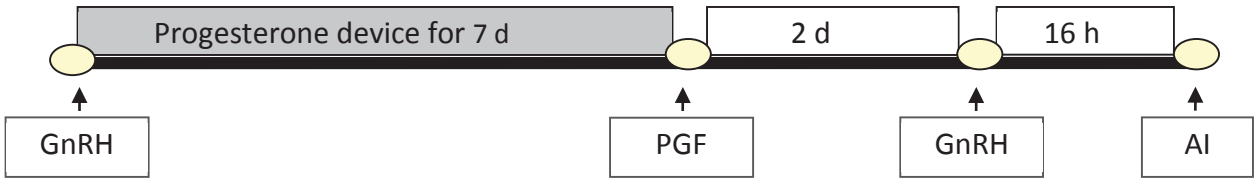

Figure 1. *The 7-day Ovsynch protocol that includes inserting a progesterone device (PRID or CIDR) between GnRH (Fertiline) and PGF (Estroplan or Estrumate) treatments.*

PGF = prostaglandin F2α, GnRH = gonadotropin-releasing hormone, AI = artificial insemination.

What did we find?

In heifers, P/AI did not differ between 5-day (59%) and 7-day (58%) protocols. Hence, our study does not suggest any benefit of one protocol over the other. Further, P/AI was the same whether or not heifers received GnRH at initiation (68% versus 71%) implying that initial injection of GnRH in a 5-day Co-synch plus progesterone device protocol is not essential to achieve acceptable P/AI.

In cows during resynchronization (32-34 days after a previous insemination), P/AI was greater with a 5-day Ovsynch plus progesterone device protocol (45%) but initial GnRH and two prostaglandins were required to ensure luteal regression and reduce pregnancy losses.

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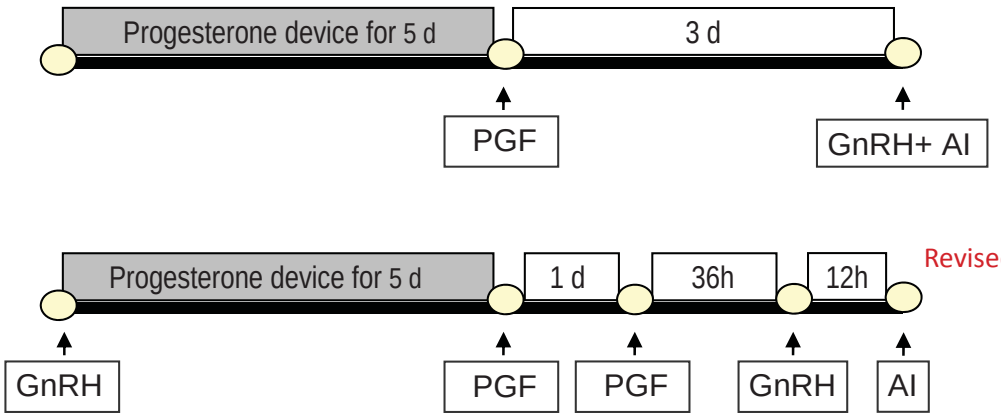

Revised Figure 2

Figure 2. *Top) The modified 5-day Co-synch protocol for dairy heifers. Bottom) The 5-day Ovsynch plus progesterone device protocol for dairy cows.*
PGF = prostaglandin F2α, GnRH = gonadotropin-releasing hormone, AI = artificial insemination.

What does this mean?

The TAI protocols described here are easy to implement in any dairy operation. In fact, several dairy herds in Alberta are already using these TAI protocols with remarkable results (Dr. Kelly Loree, Dr. Dennis Klugkist and Mr. Darren Hipkin, personal communication). The modified 5-day Co-synch protocol for heifers (Figure 2, top) is being used in three dairy herds in the province. A herd in Wetaskiwin achieves a P/AI of 63% with conventional semen and 59% with sexed semen. The P/AI in the two other herds, located in Ponoka and Lacombe, is 54% with conventional semen and 48% with sexed semen.

It is important to note that the current recommendation with sexed semen is to be used only in heifers after estrus detection but with our modified TAI protocol, P/AI to sexed semen is between 4 to 6% below that of conventional semen. In addition, the herd in Wetaskiwin has been using the 5-day Ovsynch plus progesterone device (Figure 2, bottom) for resynchronizing cows in the last 2.5 years; after 974 inseminations the overall P/AI is 47%. The TAI programs continue to evolve as a practical alternative that facilitates the use of AI by reducing the problems associated with estrus detection and, in some cases, increasing the fertility of the herd.

Summary Points

- A 5-day Co-synch protocol resulted in similar P/AI than a 7-d protocol in heifers.
- A 5-day Co-synch plus progesterone device protocol without initial GnRH yielded acceptable P/AI in heifers.
- During resynchronization, a 5-day Ovsynch plus progesterone device protocol with initial GnRH and two prostaglandins enhanced fertility in cows.

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