

# Effect of 14/11 Presynch/Ovsynch on First Service Conception Rates of Lactating Dairy Cows Compared to AI following a Detected Estrus

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## Introduction

Fertility of lactating dairy cows has declined during the past 40 years yet fertility of heifers has remained constant. Lactating dairy cows have larger follicles and corpora lutea compared to heifers yet significantly less estrogen and progesterone concentrations in circulation. Follicles must attain greater age and size to have sufficient concentrations of estrogen to induce estrus and an LH surge. This likely compromises fertility of cows that are artificially inseminated following a detected estrus. New Ovsynch programs are designed to initiate Ovsynch near day 6 or 7 of the estrous cycle to control follicle growth, increase number of corpora lutea, and subsequent concentrations of progesterone in vivo prior to the PGF of Ovsynch. Cows must be pre-synchronized in order initiate Ovsynch on day 6 or 7 of the cycle in the greatest percentage of cows possible. The 14/11 Presynch/Ovsynch program improves the percentage of cows that are near day 6 or 7 of the estrous cycle at the start of Ovsynch, and thus enhances ovulation to the first GnRH of Ovsynch and progesterone concentrations at time of PGF of Ovsynch seven days later.

## Materials and Methods

This undergraduate research project was designed to determine if a 14-11 Presynch/Ovsynch program could enhance fertility of lactating dairy cows compared to inseminating following a detected estrus. Lactating dairy cows (n=1371) at Green Meadow Farms, a 3500 cow Michigan dairy, were randomly assigned prior to the 60 day voluntary waiting period to treatment by odd or even ear tag number to either be artificially inseminated 12 hours following detected estrus or following a Presynch/Ovsynch program. Cows in the estrus detection group received 500 µg cloprostenol (Estrumate) at 60-66 days-in-milk. Cows received a second injection of 500 µg cloprostenol 14 days later if not detected in estrus and inseminated. Cows were observed for estrus three times daily during the treatment period and after until first AI or departure from the herd. The Presynch/Ovsynch treated cows received two injections of 500 µg

cloprostenol 14 days apart beginning 60-66 days-in-milk. The first GnRH (100 µg) of Ovsynch was administered 11 days following the second injection of cloprostenol. Cows in this treatment were then assigned randomly to receive either cloprostenol or dinoprost (Lutalyse) seven days following the first GnRH of Ovsynch. Then all cows in the Presynch/Ovsynch treatment received GnRH (Fertigyl) 56 hours later, then timed-AI 16 hours after the final GnRH (100 µg). All cows were diagnosed for pregnancy by the herd veterinarian 36-42 days following AI unless detected in estrus following first AI and re-inseminated.

## Results

Conception rates were greater ( $P<0.001$ ) for the Presynch/Ovsynch group compared to the cows inseminated following detected estrus (44.3% vs. 30.5%). Days-in-milk at first AI were greater ( $P<0.01$ ) in Presynch/Ovsynch vs. detected estrus (98 vs. 80), but less variable ( $P<0.01$ ). Range of days-in-milk at first AI were 95-101 in Presynch/Ovsynch and 60-140 in the detected estrus group. Within Presynch/Ovsynch there was no difference in conception rates for prostaglandin type at final PGF of Ovsynch (45.0% Estrumate vs. 43.5% Lutalyse).

## Significance

In summary, Presynch/Ovsynch improved fertility of lactating dairy cows compared to detected estrus on this dairy. Conception rates following detected estrus continue to decrease. This decrease could primarily be due to low progesterone prior to luteolysis. New pre-synchronization programs that maximize the percentage of cows that are near day 6 or 7 of the estrous cycle when the first GnRH of Ovsynch is administered appear to significantly improve conception rates of lactating dairy cows. 14/11 Presynch/Ovsynch controls luteal function to achieve this goal, although it does not directly control follicle development. Our goal is to improve the percentage of cows that allow cows to start Ovsynch on day 6 or 7 of the estrous cycle.