Using prostaglandin F2α and gonadotropin-releasing hormone simultaneously 7 d prior to Ovsynch increased first-service pregnancies per artificial insemination compared to Presynch-14/Ovsynch

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Introduction

Fertility programs such as G6G and Double-Ovsynch improve reproductive performance in lactating dairy cows following first service compared to cows inseminated following estrus. However, implementation of these programs in dairy operations can be logistically challenging due to hormone treatments on 4 different days of the week, which increase labor requirements and risk of program compliance issues. To simplify reproductive management, some dairy producers prefer to use Presynch-14 that concentrates most treatments on the same day of the week as day of pregnancy diagnosis. When combined with estrus detection, this strategy allows the insemination of a high percentage of cows (~50%) following the end of voluntary waiting period, which usually coincides with the second PGF2α treatment. However, this program might limit fertility performance since a high percentage of cows receiving timed-AI do not ovulate to the 1st GnRH of Ovsynch and may not be synchronized at time of insemination. Recently, a simpler pre-synchronization program for first service (PG+G), that uses PGF2α and GnRH simultaneously 7 d prior to Ovsynch, had similar ovulation rates to the 1st GnRH of Ovsynch and pregnancy per AI (P/AI) compared with fertility programs. This PG+G program could benefit dairy operations that use Presynch-14 since they would not need to change the weekday of injections, and reproductive performance could potentially increase. The aim of this study was to compare some physiological parameters and first-service P/AI of PG+G vs Presynch-14 in lactating dairy cows.

Materials and Methods

Between July and December of 2017, lactating dairy cows (n=1,051) between 40 and 46 days-in-milk (DIM) from a commercial California dairy farm were randomly assigned to 2 pre-synchronization treatments for first service: Presynch-14 and PG+G. Presynch-14 (PS-14) treatment consisted of the following: PGF −14d – PGF −14d – GnRH −7d – PGF −1d – PGF −32h – GnRH −16h – AI. Cows treated with PG+G received PGF – 21d – PGF and GnRH −7d – GnRH −7d – PGF −1d – PGF −32h – GnRH −16h – AI. Cows from both treatments detected in standing estrus by tail chalk any time after 54 DIM were inseminated, and treatment was discontinued (n=525). Cows that completed treatment received timed-AI between 78 and 84 DIM (n=526). In a subgroup of cows that received timed-AI, blood was collected (n=163) to assess circulating concentrations of progesterone (P4), and ultrasonographic evaluations of ovaries were performed on the day of 1st GnRH of Ovsynch (n=162) and PGF2α of Ovsynch (n=122). Pregnancy diagnoses was performed by transrectal palpation between 42 ± 7 days after AI. Continuous data were analyzed by ANOVA (MIXED, SAS) and binary data by logistic regression (GLIMMIX, SAS).

Results

Percentage of cows that received timed-AI was greater ($P<0.01$) for PG+G compared to PS-14 (65.3 vs 34.2%), which increased ($P<0.01$) mean 1st service DIM for cows treated with PG+G compared to P-14 (75.5 vs 68.7 DIM). Cows receiving timed-AI had greater ($P<0.01$) P/AI compared to cows inseminated after estrus (42.5 vs 31.5%). Cows treated with PG+G had greater ($P=0.04$) P/AI compared to PS-14 (40.3 vs 33.6%). Percentage of cows ovulating after 1st GnRH of Ovsynch was greater ($P=0.02$) for PG+G cows compared with PS-14 cows (74 vs 51%). Percentage of cows with P4 ≥ 1.0ng/mL was similar ($P=0.14$) at the 1st GnRH of Ovsynch for PG+G vs PS-14 (55 vs 67%). However, PG+G had greater ($P<0.01$) percentage of cows with P4 ≥ 1.0ng/mL at PGF of Ovsynch compared to PS-14 (93 vs 76%). Serum P4 in cows with P4 ≥ 1.0ng/mL was lower ($P<0.01$) for PG+G vs PS-14 at 1st GnRH of Ovsynch (1.48 ±0.16 vs 3.06 ±0.38 ng/mL). However, PG+G cows had greater ($P<0.01$) serum P4 compared to PS-14 cows at PGF of Ovsynch, (4.78 ± 0.27 vs 3.15 ± 0.42 ng/mL).

Significance

PG+G treatment increased first service P/AI compared to PS-14 treatment when both treatments were used in combination with estrus detection.