

# Comparison of a novel Ovsynch program utilising early pregnancy diagnosis as a measure of performance in Australian pasture based dairy herds

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## Introduction

In recent years the fertility of the dairy cow has been decreasing and there has been some speculation that the current Ovsynch programs on the market have not been used at the optimum time. Ovsynch is an oestrus synchrony program where hormone injections are used to bring cows into oestrus so that fixed time artificial insemination (FTAI) can be used. The original program involves an injection of gonadotropin-releasing hormone (GnRH) on day 0, prostaglandin (PGF2 $\alpha$ ) on day 7, GnRH on day 9 and FTAI on day 10 (Pursley et al 1997). Based on studies looking at progesterone levels with the current Ovsynch program, a new program was proposed incorporating a second injection of PGF2 $\alpha$  on day 8 to increase the probability of atresia of the corpus luteum (CL). The efficacy of the program will be established through early pregnancy diagnosis. A subset of animals in each group was submitted for progesterone testing on two separate occasions as an indication of whether ovulation occurred at AI (Cavaliere et al 2003).

## Materials and Methods

Five herds comprised of high-producing, predominantly Holstein-Friesian cows including a total of 1703 animals were recruited for this study. Odd and even ear tag numbers were used to randomly assign cows to two groups. These animals were sourced from several herds in South West Victoria, managed on a predominantly pasture based system. Group 1 (odd) consisting of 851 animals, was given the original Ovsynch program incorporating GnRH at day 0, PGF2 $\alpha$  at day 7, and GnRH at day 9. Group 2 (even) consisting of 852 animals was given the modified Ovsynch program incorporating GnRH at day 0, PGF2 $\alpha$  at day 7 and 8 and GnRH at day 9. All cows were submitted for AI by an experienced technician on day 10. A subset of animals from both groups in all herds was subject to two blood progesterone tests, the first taken at the first PGF2 $\alpha$  and the second at AI to provide an indication of whether the animals ovulated at the time of AI. All animals were submitted for pregnancy diagnosis between day 35 and 49 after the date of AI using linear ultrasound to determine the efficacy of the new program compared to the original program.

The Cochran-Mantel-Haenszel procedure was used to provide an estimate of the association between treatment group (modified Ovsynch versus original Ovsynch), adjusting for the effect of the confounding effect of herd.

## Results

The pregnancy rate for cows in the modified Ovsynch group was 49.1% compared with a pregnancy rate of 42.0% for cows in the original Ovsynch group.

After adjusting for the effect of herd, the pregnancy rate for modified Ovsynch treated cows was 7.0% (95% CI 2.3% to 11%;  $\chi^2$  test statistic 8.26;  $P < 0.01$ ) greater than the pregnancy rate for cows treated using the original Ovsynch program. These findings support the findings of trials carried out in the USA where it was found that a second injection of PGF2 $\alpha$  increased conception rates by 10% (Wiltbank et al 2015). A total of 7.6% of cows in the modified Ovsynch group had plasma progesterone concentrations  $\geq 2$  ng/mL compared with 20% of cows in the original Ovsynch group (Table 1.2.2). After adjusting for the effect of herd, the proportion of cows with plasma progesterone concentrations  $\geq 2$  ng/mL for cows treated with the modified Ovsynch program was 12% (95% CI 2% to 22%;  $\chi^2$  test statistic 4.77;  $P < 0.03$ ) lower than that of cows treated with the original Ovsynch program.

## Significance

In this study, it was found that treatment with a second injection of PGF2 $\alpha$  on day 8 of the Ovsynch program increased conception rate by 7% compared with cows that received a single injection of PGF2 $\alpha$  on day 7. Progesterone analyses indicate that treatment with a second injection of PGF2 $\alpha$  reduced the percentage of cows with inadequate CL regression at the time of AI. This further supports the hypothesis that the inclusion of a second injection of prostaglandin on day 8 of the Ovsynch program increases the likelihood that the cow will ovulate and the probability of conception to AI will be increased.