OESTRUS SYNCHRONISATION AND FERTILITY IN DAIRY HEIFERS USING COMBINATIONS OF CIDR INSERTS AND PROSTAGLANDIN INJECTIONS

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Luteal status (Xu *et al*. 1997) and the interval between prostaglandin ($PGF_{2\alpha}$) injections (Watts and Fuquay 1985) can affect oestrus response rate and conception rate to $PGF_{2\alpha}$-based synchrony treatments. The aim of this study was to evaluate the efficacy of an oestrus synchrony protocol with 2 injections of $PGF_{2\alpha}$ given 11 or 14 days apart with or without progesterone supplementation.

This study included 631 dairy heifers of approximately 13 months of age from 3 spring-calving herds (n=413, 57 and 161). All heifers were treated with 2 intramuscular injections of $PGF_{2\alpha}$ (Lutalyse; Pharmacia Australia) either 11 (D11; n=328) or 14 (D14; n=303) days apart. The heifers were randomly assigned to a progesterone (CIDR; n=325) or untreated control group (control; n=306). Heifers in the CIDR group were treated for 5 days prior to the second $PGF_{2\alpha}$ injection with an intravaginal progesterone-releasing device containing 1.38 g of progesterone (CIDR, Genetics Australia). Effects of treatment, farm and treatment by farm interactions on submission rate (SR1), conception rate (CR1) and pregnancy rate (PR1) to first artificial insemination (AI) were tested using the PROC LOGISTIC procedure of SAS (1996). Selected Odds ratios (OR) and confidence intervals (CI) and significant interactions are presented.

Table 1. Submission rate, conception rate and pregnancy rate to first AI in dairy heifers treated with combinations of $PGF_{2\alpha}$ and CIDR inserts (see text for details of treatments).

	$PGF_{2\alpha}$D11 +Control	$PGF_{2\alpha}$D11 +CIDR	$PGF_{2\alpha}$D14 +Control	$PGF_{2\alpha}$D14 +CIDR	Treatment	Farm	Treatment by Farm
Number	156	172	150	153		P Value	
Submission rate to 1st AI[A] (%)	71	74	80	80	NS	<0.01	<0.05
Conception rate to 1st AI[B] (%)	45	51	48	62	<0.05	NS	NS
Pregnancy rate to 1st AI[C] (%)	32	38	39	50	<0.01	<0.05	NS

[A] Number that received at least 1 AI within 120 h of the 2nd $PGF_{2\alpha}$ injection/number treated.
[B] Number pregnant to AI within 120 h of the 2nd $PGF_{2\alpha}$ injection/number artificially inseminated.
[C] Number pregnant to AI within 120 h of the 2nd $PGF_{2\alpha}$ injection/number treated.

Results of the study are given in Table 1. Farm had a significant effect on SR1, with variation in SR1 between farms: Farm 1 = 78%, Farm 2 = 95% and Farm 3 = 66%. The CIDR treatment did not affect SR1. The $PGF_{2\alpha}$ interval did not affect SR1, however, there was a significant interaction between $PGF_{2\alpha}$ interval and farm for SR1. The CIDR treatment increased CR1 relative to controls, while $PGF_{2\alpha}$ interval had no significant effect on CR1. Farm also had no significant effect on CR1. Conception rate to the first AI was greater for $PGF_{2\alpha}$D14+CIDR relative to $PGF_{2\alpha}$D14+Control (OR 1.76, CI 1.06-2.94, P<0.05), and also for $PGF_{2\alpha}$D14+CIDR compared with $PGF_{2\alpha}$D11+Control (OR 0.50, CI 0.30-0.85, P<0.01). The CIDR treatment increased PR1 relative to controls. Heifers treated with $PGF_{2\alpha}$ 14 days apart had higher PR1 than heifers treated 11 days apart. Farm also had a significant effect on PR1. Pregnancy rate to the first AI was greater for $PGF_{2\alpha}$D14+CIDR versus $PGF_{2\alpha}$D14+Control (OR 1.59, CI 1.01-2.52, P<0.05), for $PGF_{2\alpha}$D14+CIDR versus $PGF_{2\alpha}$D11+CIDR (OR 0.59, CI 0.38-0.93, P<0.05), and for $PGF_{2\alpha}$D14+CIDR versus $PGF_{2\alpha}$D11+Control (OR 0.45, CI 0.28-0.72, P<0.01).

In conclusion, CIDR treatment for 5 days prior to a second $PGF_{2\alpha}$ injection significantly increased conception rates and pregnancy rates to first AI in dairy heifers.

XU, Z.Z., BURTON, L.J. and MACMILLAN, K.L. (1997). *Theriogenology* **57**, 687-701.
WATTS, T.L. and FUQUAY, J.W. (1985). *Theriogenology* **23**, 655-661.
SAS (1996). 'Statistical Analysis System.' (SAS Inst. Inc.: Cary, NC.)

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