

A COMPARISON OF THREE METHODS OF OESTRUS SYNCHRONISATION FOR FIXED TIME INSEMINATION IN DAIRY HEIFERS

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We sought to evaluate 3 commonly used methods for synchronisation of oestrus for fixed-time insemination; the controlled release intra-vaginal device (Eazi-breed CIDR - Carter-Holt Harvey Plastics, New Zealand) (CIDR); prostaglandins (Prosolvin - Intervet Pty Ltd) (PG); and a norgestomet/oestradiol valerate aural implant (Crestar - Intervet Pty Ltd) (CSTAR). Effective means of synchronisation of oestrus, which will allow successful use of fixed-time insemination, will encourage greater use of artificial insemination in heifers.

Heifers (n = 327) were aged between 20-24 months and were well grown, estimated to be greater than 350 kg and randomly assigned within blocks of 3 to the 3 treatments. Treatment 1 (n = 108) consisted of the intra-vaginal implantation of a CIDR for 10 days. These cattle were given a 10 mg oestradiol benzoate capsule at device insertion and 2 ml of PG at day 6 following device insertion. Treatment 2 (n = 110) consisted of 2 injections of 1 ml of PG given 10 days apart. Treatment 3 (n = 109) consisted of the aural insertion of a norgestomet 3 mg pellet and injection of 3 mg of norgestomet and 5 mg oestradiol valerate at pellet insertion. The pellet was removed from the ear on day 10. Heifers were inseminated 48 hours after device removal for CIDR and CSTAR groups, and 72 and 96 hours after treatment for the PG group. The heifers were tail painted and reported as in oestrus if most of the tail-paint was removed. Two outcomes were examined: display of oestrus and pregnancy.

The heifers were mated in 4 batches over a 6-month period. Six weeks following mating, the heifers were tested to determine pregnancy. The operators detecting oestrus and diagnosing pregnancy were blinded to group allocations. Only 4 bulls were used in the trial and were randomly and evenly distributed across treatments.

Table 1. Percentage of heifers detected in oestrus and pregnancy rates for heifers displaying or not displaying oestrus

	On heat	Pregnancy with heat	Pregnancy with no heat
CIDR	89.81	69.07	9.09
PG	76.15	61.45	15.38
CSTAR	80.91	57.30	28.57

Table 1 shows the crude percentages of heifers in oestrus and pregnant if oestrus was detected or not detected for all groups. All treatments resulted in pregnancy rates to fixed time insemination of greater than 50% (CIDR 63%, PG 50%, CSTAR 52%). The 63% conception rate for CIDR-treated heifers suggests that the treatment protocol was suitable for use with fixed-time insemination. Following preliminary data analysis, the data was examined by logistic regression. After controlling for the effects of batch and bull, there were significant differences between treatment groups in the percentage of heifers detected in oestrus ($P = 0.04$). Heifers treated with PG were at 0.348 times less likely to be detected in oestrus (95% confidence interval 0.159 to 0.761) than those treated with CIDR, but detection of oestrus was not significantly different for CSTAR-treated heifers compared with CIDR-treated heifers (Odds ratio 0.466; 95% confidence level 0.209 to 1.04). The effect of treatment on pregnancy was not significant ($P > 0.05$) after controlling for the effects of bull and batch, but approached significance as PG-treated heifers were at 0.594 times the risk (95% confidence interval 0.343 to 1.03) and CSTAR-treated heifers at 0.626 times the risk (95% confidence interval 0.362 to 1.08) of CIDR-treated heifers, for pregnancy. Table 1 shows that there was a large percentage of heifers that conceived without a detected oestrus in the CSTAR group.