Manipulating ovaries' follicle wave patterns can partially synchronise returns to service and increases the pregnancy rate to second insemination

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INTRODUCTION

The recognised roles of oestradiol in the bovine oestrous cycle include stimulating behavioural symptoms of oestrus, facilitating spontaneous luteolysis and initiating the ovulatory surge of LH. An important ancillary role with progesterone is to inhibit the release of gonadotrophins (Burke *et al.*, 1996). Oestradiol administered by injection or per vaginum can perturb follicle development with consequent effects on responses to superovulation (Bo *et al.*, 1994) and on synchrony patterns (Macmillan *et al.*, 1993).

The hypotheses which were tested in the following trial were that injecting a low dose of oestradiol benzoate (1mg ODB) at about mid-dioestrus during the cycle following first insemination: (i) would not reduce the pregnancy rate to this insemination; but (ii) would alter the pattern of returns to service; and (iii) could affect the pregnancy rate to the second insemination.

MATERIALS AND METHODS

Lactating dairy cows (n=343) in 5 commercial herds were injected intramuscularly with 1mg ODB (CIDIROL™; InterAg, NZ) at 12, 13 or 14 days after first insemination (Day 0). Equivalent numbers of herdmates (within day within herd) were categorised as members of an untreated group (n=354). If a cow had not conceived to its first insemination, it was presented for a second one when detected in oestrus. Conception dates and pregnancy rates were confirmed by palpation of uterine contents about 9 to 11 weeks after the first insemination. Pregnancy rates to second insemination only included those animals which had a return interval of 15 to 27 days after first insemination. Statistical analyses focussed on treatment effect (±ODB), taking into account the day of cycle at injection and herd.

RESULTS

From 45% to 53% of treated cows which returned to service, were detected in oestrus and re-inseminated 9 or 10 days after being injected with ODB. This reduced the proportion of cows with intervals of <21 days and increased the incidence of intervals of >21 days as compared to untreated herdmates (12% vs 41%, and 46% vs 16%; $P<0.01$) (Table 1). These changes occurred without any change in the pregnancy rate to first insemination (61.3% vs 58.6%; $P>0.20$). In contrast, the average pregnancy rate to second insemination made with cows in the treated group was significantly higher than with re-inseminated cows in the control group (69.1% vs 49.5%; $P<0.05$) (Table 1).

CONCLUSIONS

The strategic use of an injection of a low dose of ODB altered the distribution of return intervals to first insemination without affecting the pregnancy rate to that insemination. The altered pattern in these intervals was associated with an increased pregnancy rate to second insemination. The change in the pattern of returns varied with the interval from first insemination to the injection of ODB, but most intervals were 9 or 10 days after the injection. This suggests that ovarian follicle wave patterns had been perturbed so that a new wave emerged and developed within 4 days of ODB injection (Bo *et al.*, 1994). If the effects observed in this trial can be subsequently verified, then the routine use of ODB could facilitate easier monitoring of returns to service and increased pregnancy rates for re-insemination.

REFERENCES

Burke *et al.* (1996) *Animal Reproduction Science* **45:**13-28.
Bo *et al.* (1994) *Theriogenology* **41:** 1555-1569.
Macmillan *et al.* (1993) *Proceedings of the New Zealand Society of Animal Production* **53:** 267-270.

TABLE 1: Pregnancy rates (PR) to first or second inseminations and inter-insemination intervals among cows injected with oestradiol benzoate (1mg ODB) on Days 12,13 or 14 after first insemination (Day 0), or in a control group.

Group	n		% return intervals (days):							PR	
	1st	2nd	<20	20	21	22	23	24	>24	1st	2nd
Day 12	112	40	15	7	30	15	10	-	23	61	72
Day 13	98	34	3	3	9	32	21	3	29	59	65
Day 14	133	30	5	2	12	8	25	28	20	64	69
Days 12-14	343	114	8	4	18	18	18	10	24	61	69
Control	354	132	21	20	16	7	5	4	27	59	50