The timing of CIDR withdrawal and ram introduction on ewe fertility

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ABSTRACT

Oestrous synchronisation in ewes is normally achieved using polyurethane sponges containing progestagen. The recent development of silicone elastomer controlled internal drug releasers (CIDR) offers an alternative synchronising technique. The appropriate duration of CIDR treatment and timing of ram introduction has yet to be determined. Romney ewes had a CIDR type G inserted on the same date and withdrawn either 11, 12, 13 14 or 15 d later (Trial 1). The ewes were joined in single sire groups with 9 rams at CIDR withdrawal. Thus confounding exists between duration and days since ram matings commenced. Matings were recorded over days 1 to 7 and 15 to 21. Cheviot ewes were joined in single sire groups with 5 rams at either 30 or 48 h after CIDR withdrawal (Trial 2). Matings were recorded on days 2, 3 and 15 to 21. Pregnancy status was assessed by ultrasonic scanning.

In Trial 1 more ewes mated by day 1 following 11 and 15 d CIDR durations than 11 to 13 d durations (10% and 7% v 4%). Apart from this, longer durations were associated with fewer ewes subsequently mating. There was no association between duration of CIDR treatment and return matings, pregnancies to first service or multiple pregnancies. However, overall more ewes were pregnant following intermediate durations.

In Trial 2 most of the ewes joined at 30 h had mated by 48 h. By day 3, nearly all ewes had mated in both groups. Non-return rates (80% v 63%) and first service pregnancy rates (70% v 58%) were higher in ewes joined at 30 h than at 48 h. The final pregnancy rate was similar in both groups (88% v 90%).

CIDRs should be timed to be withdrawn at 12 to 14 d to maximise pregnancy rates to 2 rounds of mating when ewes are progressively joined with rams. Joining rams at 30 rather than 48 h after withdrawal results in earlier lambing since more ewes are pregnant to matings at the synchronised oestrus.

Keywords CIDR; oestrous synchronisation; ram joining; ewe fertility.

INTRODUCTION

Oestrus sychronisation in ewes is normally achieved using polyurethane sponges containing synthetic progestagen (Tervit, 1983). The recent development of silicone elastomer controlled internal drug releasers (CIDR) containing the natural hormone progesterone offers an alternative to sponges (Welch, 1983). While treatment of ewes with sponges for 15 d can given high conception rates (Smith, 1982), the effect on oestrus and fertility of varying the duration of CIDR treatment has not been determined. Despite this paucity of information, CIDRs have been used from 11 up to 15 d to effect synchronisation.

CIDRs initiate early and more compact times of first oestrus when compared to sponges (R.W. Kelly, R.A.S. Welch and H. de Langen, unpublished data). Thus, the practice of delaying ram introduction until 48 h after sponge withdrawal to ensure high fertility (Joyce, 1972) may have to be reduced when CIDRs rather than sponges are used.

The aims of this study were to determine the effects of duration of CIDR treatment (11 to 15 d) (Trial 1) and the timing of ram introduction (30 v 48 h) (Trial 2) on oestrus and fertility in ewes.

MATERIALS AND METHODS

Trial 1

Five hundred and fifty Romney ewes were randomly allocated to 5 groups, to have CIDRs withdrawn at 11, 12, 13, 14 or 15 days after insertion. Within each of these 5 groups, ewes were allocated to one of 9 single sire mating groups (5 x 9 factorial design). All CIDRs were inserted on the same date and ewes were joined with their appropriate sires at withdrawal (day of withdrawal = day 0) for 21 d. As a result of this design, confounding exists between timing of CIDR withdrawal and time since rams were first joined by ewes. Matings were recorded daily between days 1 to 7 and 15 to 21.

Trial 2

CIDRs were withdrawn from 150 Cheviot ewes (day of withdrawal = day 0) after 12 d. Thirty hours later, half of the ewes were joined in 5 single sire mating groups. Four of the sires were allocated 12 ewes and the fifth allocated 22 ewes. The remainder of the ewes were similarly joined with the other 5 sires 48 h after CIDR withdrawal. Matings were recorded on days 2, 3 and 4. The rams were removed until days 15 to 21 when return matings were recorded.

Analysis

The pregnancy status of ewes in both trials was determined by ultrasonic scanning. The data were analysed using logit transformation and standard statistical procedures. In Trial 1, timing of CIDR

TABLE 1 Effect of timing of ram introduction on proportion (%) ewes mated and proportion (%) ewes pregnant

Timing of ram introduction	Ewes first mated		Ewes remated		Ewes pregnant to first mating
	Day 2	Day 3	Days 16-19	Days 16-21	
30 hours	84	13	9	20	70
48 hours	0	95	23	37	58

practical importance if 2 rounds of mating are practiced. Under these circumstances, withdrawal would be best timed between 12 and 14 d after insertion.

The pattern of first mating for the Cheviot ewes in Trial 2 depended on the timing of ram introductions (Table 1). The majority of ewes joined to rams at 30 h had mated before the second group of rams were joined. However, by day 3, a similar proportion of ewes had mated in the 2 groups (97% v 95%). Fewer than 2% of the ewes failed to mate by day 4.

It is clear that the majority of ewes had commenced oestrus between days 1 and 2. This is consistent with reports in other studies using CIDRs during the breeding season (R.W. Kelly, R.A.S. Welch and H. de Langen, unpublished data).

Return matings were higher ($P<0.05$) in ewes joined with rams at 48 h after CIDR withdrawal (Table 1). This difference was reflected in a difference in ewes pregnant to first mating. This may have been due to reduced fertilisation rates arising from the higher mating load in rams in the groups joined later. Presumably, 80 to 90% of the ewes would have been in oestrus in these later groups at ram introduction with a further 10% beginning oestrus over the following 24 h. Whatever the reason for the apparently lower fertility at first mating, the effect was alleviated following remating since about 88% and 90% of ewes in the 2 groups were pregnant to 2 rounds of mating.

These results suggest that ram introduction should be at 30 rather than 48 h after CIDR withdrawal. The net effect would be more ewes lambing at the first synchronised oestrus. The effect of earlier ram introduction times on ewe reproduction warrants investigation.

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REFERENCES

Hamra A.H.; Massri Y.G.; Marcek J.M.; Wheaton J.E. 1986. Plasma progesterone levels in ewes treated with progesterone-controlled internal drug-release dispensers, implants and sponges. *Animal reproduction science* **11:** 187-194.

Joyce M.J.B. 1972. Timing of ram introduction in ewes treated with sponges and PMSG. *Proceedings of the VIIth Congress on Animal Reproduction and Artificial Insemination,* Munich. **2:** 935.

Smith J.F. 1982. Field experience with oestrous control in sheep and cattle. *Proceedings of the World Congress on Sheep and Beef Cattle Breeding* Eds. R.A. Barton and W.C. Smith. Dunmore Press, Palmerston North. **2:** 295-301.

Tervit H.R. 1983. Synchronisation of oestrus in sheep. *Proceedings of the New Zealand Sheep and Beef Cattle Society of the New Zealand Veterinary Association* **13:** 53-63.

Welch R.A.S. 1983. Fertility of ewes treated with CIDR dispensers incorporating different levels of progesterone. New Zealand Ministry of Agriculture and Fisheries, Agricultural Research Division, Annual Report 1982-83. p.64.