Artificial insemination of farmed feral goats with frozen-thawed semen

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ABSTRACT

Kidding and multiple kidding rates following artificial insemination (AI) either at the second oestrus after CIDR withdrawal or after vasectomised buck introduction to isolated does were compared in a factorial design. Other factors were a comparison of cervical and laparoscopic AI; Regulin melatonin implants 4 weeks before AI versus no implants; and once daily oestrus detection with AI 2-5 hours after detection versus twice daily oestrus detection with AI 9-18 hours after detection. AI was carried out from 6-14 April, 20-28 days after CIDR withdrawal or 6-14 days after buck introduction. Laparoscopic AI resulted in a higher kidding rate (65%) than cervical AI (34%). Regulin implants resulted in a lower kidding rate (38%) than no implants (47%) but a higher multiple kidding rate (68% versus 50%). There was no effect of once versus twice daily oestrus detection on kidding rate. CIDR treatment led to a higher proportion of the does present being inseminated (98%) than buck introduction (88%) during the 9 day AI period, but had no effect on overall fecundity.

Keywords Feral does; artificial insemination; cervical; laparoscopic; Regulin; melatonin; CIDRs; buck effect; kidding rates

INTRODUCTION

On-time cervical insemination (AI) with frozen-thawed semen at a progesterone synchronised oestrus, with or without PMSG injection, has resulted in kidding rates below 30% (Moore *et al.*,1987; Moore *et al.*,1988). However Bowen (1988) has obtained kidding rates of 56% with cervical AI either 5-14 days after vasectomised buck introduction, or at the second oestrus after CIDR withdrawal. In both cases there was twice-daily oestrus detection followed by AI 9-17 hours later.

In the present study, cervical AI was carried out following buck introduction and at the second oestrus after CIDR removal as in Bowen's trial to see if the high kidding rates with these regimes were repeatable. The effects of once versus twice daily oestrus detection on kidding rates were compared, as were the effects of vasectomised buck introduction before or after CIDR insertion, and the effects of sexually active versus inactive bucks in the buck introduction group without CIDRs. One-third of the does were artificially inseminated through a laparoscope as a comparison with the cervical method.

MATERIALS AND METHODS

The design was a 2x4x2x2 factorial (n=6,N=198) with 2 melatonin treatments (Regulin implants 4 weeks before AI versus no Regulin implants), 4 types of doe preparation before AI (introduction of vasectomised bucks 14 d before CIDRs inserted, introduction of bucks at CIDR removal, introduction of sexually active vasectomised bucks to isolated does, introduction of inactive bucks to isolated does), 2 regimes of oestrus detection (oestrus detection once daily versus detection twice daily) x 2 types of AI (cervical versus laparoscopic).

Sexually active bucks were grazed with oestrous spayed does for 1 week before introduction. CIDRs were inserted on 29 February and removed

on 17 March. Regulin implants were inserted on 7 March. The does were divided into 2 groups on 5 April, 1 group was checked for mating marks at 0700 h and 1500 h and the other group was checked only at 0700 h. In the twice daily detection mob those with mating marks in the morning were inseminated from 1600-1700 h whereas those with mating marks in the afternoon were inseminated next morning from 0830-1130 h. In the once daily group insemination was carried out from 0830-1130 on the day of detection.

Insemination was carried out from 6 April to 14 April; 20-28 days after CIDR removal or 6-14 days after buck introduction.

Semen frozen in straws containing 50 or 100 million sperm, was obtained from 9 Cashmere bucks. Semen from one buck was frozen at only 1 dose rate.

Date of giving birth and number of kids born to each doe inseminated was recorded.

RESULTS

TABLE 1 Effect of Regulin and doe preparation on the proportion of does inseminated (does inseminated/does joined)

Main effect	DJ[1]	DI[1]/DJ (%)
Regulin	105	92
No Regulin	95	94
Vas. bucks 2 weeks before CIDR insertion	49	98
Bucks at CIDR removal	48	98
Active bucks	53	89
Inactive bucks	50	88

[1] DJ does joined
DI does inseminated

Percentage of Does Inseminated

Only those does that showed oestrus during a 9-day period were inseminated. Significantly more (10%) of the CIDRed does were inseminated than those that were not CIDRed (Table 1).There was no effect of the time of introduction of the buck in the CIDRed does and no advantage to having sexually active bucks in the buck-only group on the proportion of does inseminated.

TABLE 2 Effect of type of AI, Regulin and doe preparation on kidding, multiple kidding and fecundity

Main effect	DI[1]	DK[1]/DI (%)	DKM[1]/DK (%)	KB[1]/DJ (%)
Cervical	134	34	58	53
Laparoscopic	52	65	59	92
Regulin	97	38	68	61
No Regulin	89	47	50	68
Vas. bucks 2 weeks before CIDR insertion	48	42	60	67
Bucks at CIDR removal	47	36	59	56
Active bucks	46	49	43	66
Inactive bucks	44	43	74	68

[1] DI does inseminated
DK does kidding
DKM does kidding multiples
KB kids born

Fertility (Does Kidding/Does Inseminated)

Laparoscopic AI was markedly more successful than cervical AI (Table 2) in terms of doe fertility. There was a tendency for melatonin to decrease doe fertility, but this was not significant. There was no effect of doe preparation or frequency of oestrus detection in doe fertility.

Prolificacy (Does Multiple Kidding/Does Kidding)

There was no effect of AI method on doe prolificacy (Table 2). Prolificacy rates were 18% higher in the melatonin treated does (Table 2). There was no effect of doe preparation or frequency of oestrus detection on prolificacy.

Fecundity (Number of Kids Born/Does Inseminated)

Laparoscopic AI led to double the fecundity levels produced by cervical AI as a result of the marked advantage shown by laparoscopic AI in terms of fertility. None of the other factors investigated affected the final fecundity.

DISCUSSION

Although cervical AI at a synchronised oestrus was avoided in this study this did not lead to fertility levels of over 50% as were achieved by Bowen (1988). There was no advantage in using twice daily detection of oestrus and delaying AI in the manner used by Bowen (1988). It appears that with the methods of semen freezing used in this study cervical AI is not reliable enough to be used commercially. This contrasts with laparoscopic AI which has led to acceptable kidding rates at a natural oestrus as in this study or on-time following synchronisation (Ritar *et al.*, 1987).

The use of 1 Regulin implant 4 weeks before AI increased doe prolificacy rates by 18%. This agrees with the work of McPhee *et al.* (1987) and Earl *et al.* (1987) who used Regulin in Angora does mated in December and January respectively. However these studies also showed Regulin increased fertility, which was not found in this study, where a different breed of goat and season of mating were employed.

The CIDR treatments led to a higher proportion of does being inseminated during the 9-d period of AI, but this did not lead to increases in kids born per doe present.

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