Cervical versus laparoscopic AI of goats after PMSG injection at or 48 hours before CIDR removal

R. W. MOORE, C. M. MILLER AND D. R. H. HALL
Whatawhata Research Centre
Ministry of Agriculture and Fisheries, Hamilton

B. W. DOW
Ruakura Agricultural Centre
Ministry of Agriculture and Fisheries, Hamilton

ABSTRACT

Feral does were used for a 2 x 3 x 2 factorial, with 2 types of insemination (cervical *v* laparoscopic), 3 pregnant mare serum gonadotrophin (PMSG) levels (no PMSG, 150 i.u. 2 d before controlled internal drug releaser (CIDR) removal and 150 i.u. at CIDR removal) and 2 sperm dose rates (50 *v* 100 million sperm). The semen, obtained from 9 Cashmere bucks, was frozen in straws containing 100 million sperm. Three operators inseminated 171 does 2 d after CIDR removal. The overall kidding rate from cervical insemination was 24% and from laparoscopic was 50%. There was no effect of PMSG, sperm dose rate, buck or inseminator on the percentage of does kidding.

Keywords Feral goats; AI; cervical; laparoscopic; frozen-thawed semen; CIDR; PMSG.

INTRODUCTION

In a previous trial involving on-time cervical artificial insemination (AI) with frozen-thawed semen, a dose of 333 i.u. of pregnant mare serum gonadotrophin (PMSG) at the time of removal of the intra-vaginal device decreased the pregnancy rate by 20% (Moore *et al.*, 1987).

This depression in pregnancy rate induced by PMSG is contrary to the findings of several workers (Corteel *et al.*, 1982; Ritar and Salamon, 1981; 1983). Ritar and Salamon (1987) found that kidding rates with PMSG injection 48 h before withdrawal of the intravaginal device were 8% higher than the rates where injection and withdrawal coincided, but this result was not significant. The 2 times of injection were compared in this study, with synchronised feral does inseminated both cervically and laparoscopically.

MATERIALS AND METHODS

The design was a 2 x 3 x 2 factorial, with 2 types of insemination (cervical *v* laparoscopic), 3 PMSG levels (no PMSG, 150 i.u. 2 d before controlled internal drug release intravaginal device (CIDR) removal and 150 i.u. at CIDR removal) and 2 sperm dose rates (50 *v* 100 million sperm). The semen, obtained from 9 Cashmere bucks, was frozen in straws containing 100 million sperm. There were 3 inseminators for both types of insemination.

CIDRs were inserted in 178 mixed-age feral does on 19 March, one-third of the does were injected with 150 i.u. of PMSG on either 3, 4 or 5 May and CIDRs removed 2 d following the injection, another third of the does were injected on either 5, 6 or 7 May and CIDRs were removed on the day of the injection and the remainder had CIDRs removed on 5, 6 or 7 May with no PMSG injection. All does were inseminated 2 d after CIDR removal on 3 AI days such that AI day 1 was associated with a 17 d CIDR insertion, day with 18 d and day 3 with a 19 d insertion. Vasectomised bucks were introduced at CIDR removal. The date of giving birth and the number of kids born to each doe inseminated was recorded.

RESULTS

The laparoscopic technique led to twice the kidding rate of the cervical technique (Table 1). PMSG injection (150 i.u.) did not improve the kidding or multiple kidding rate significantly, either at CIDR removal or 2 d before this. Neither inseminators, bucks nor sperm dose rates had an effect on kidding rate.

There was a significant type of insemination x AI date interaction in kidding rate ($P<0.05$) and multiple kidding rate ($P<0.01$). This was the result of a progressive fall in both these rates from the first day of cervical AI to the third, while laparoscopic rates remained the same (Table 2).

There were 39% of the cervical inseminations that were deposited directly in the uterus, 20% halfway through the cervix, and 32% a short distance into the os. There was no difference between AI dates in the proportions of the different depths of insemination. An examination of the kidding rates

TABLE 1 Effect of AI technique and PMSG treatment on kidding and multiple kidding rates.

Type of insemination	Treatment	DI[1]	DK[1]/DI (%)	DKM[1]/DK (%)
Cervical	No PMSG	31	23	80
	PMSG 2 d before withdrawal	28	21	50
	PMSG at withdrawal	33	27	56
Laparoscopic	No PMSG	26	50	50
	PMSG 2 d before withdrawal	33	42	53
	PMSG at withdrawal	27	59	47

[1] DI Does inseminated; DK Does kidding; DKM Does kidding multiples.

associated with each depth of cervical insemination showed there was a progressive fall-off at each depth. The fall-off was particularly pronounced when the insemination was done at the os (Table 3).

DISCUSSION

This study agrees with others that have obtaned higher success rates injecting frozen-thawed semen directly into the uterus with the aid of a laparoscope rather than depositing the semen non-surgically into the cervix. Ritar *et al.* (1987) found that laparoscope AI was 19% more successful in non-return rates for synchronised does and H.R. Tervit (unpublished) found that pregnancy rates for the laparoscope technique were 49% higher for synchronised does and 13% higher for does at a natural oestrus.

The progressive decline in fertility and prolificacy from the first to third day peculiar to cervical AI suggests that there has been a breakdown in sperm transport in the last 2 d, possibly associated with the length of insertion of the CIDR (18-19 d). However Ritar *et al.* (1987) found no effect of the length of CIDR insertion (15-20 d) on non-return rates to cervical AI.

The overall kidding rate of the cervical technique is not encouraging for its use at a synchronised oestrus, with or without PMSG treatment.

TABLE 2 Effect of AI technique and AI date on kidding and multiple kidding rates.

Type of insemination	Date	DK[1]/DI (%)	DKM[1]/DK (%)
Cervical	May 7	41	82
	May 8	24	43
	May 9	7	0
Laparoscopic	May 7	52	43
	May 8	44	38
	May 9	53	65

[1] DI Does inseminated; DK Does kidding; DKM Does kiddling multiples.

TABLE 3 Effect of site of cervical insemination on kidding rates on 3 AI dates.

AI date	Depth of insemination		
	Os	Mid-cervix	Uterus
7 May	33	42	50
8 May	1	25	33
9 May	0	0	13

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