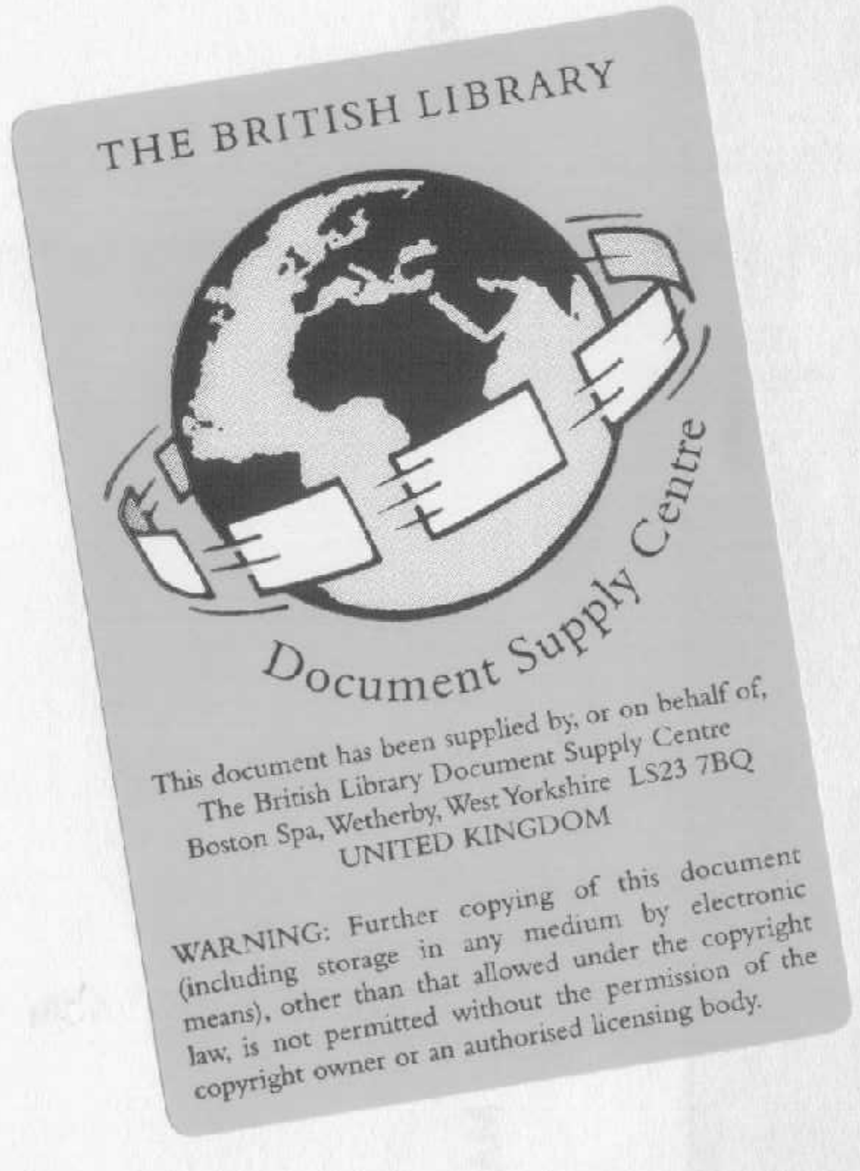

INCREASING LAMBING PERFORMANCE OF EWES BY ACTIVE IMMUNIZATION WITH POLYANDROALBUMIN

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ABSTRACT

This study was conducted on 110 cross-bred Hisardale x Nali ewes. The ewes were divided into two groups: one group was treated with 2 ml of polyandroalbumin subcutaneously(s.c.) twice at an interval of 28 d, with breeding rams introduced 28 d after the second injection of the drug. The second group served as the untreated controls.

Of the 55 ewes in each group, 52 were mated during the 40d breeding period. The occurance of estrus and estrous cycle length were the same in the two groups. Fortysix ewes in the treated group and 47 ewes in the control group lambed, producing 55 and 47 lambs, respectively. In the treated group, the lambing rate, fecundity and fertility were 100, 96.36 and 88.46%,while these values for the control group were 85.45, 83.64 and 90.38%. Prolificity rates were 1.15 and 0.98 for the treated and control group, respectively.

Key words: polyandroalbumin, immunization, ewes, lambing fertility, fecundity, estrus

INTRODUCTION

An increase in the ovulation rate of ewes would also help increase the no.of lambs harvested using the available stock. Among the several techniques that are available to increase the ovulation rate, the hormone immunoneutralization technique has been employed in ewes. This technique works on the principle of delaying the negative feed back of ovarian steroids on pitutary, intern causing high levels of gonadotropic hormones and increased ovulation.

Immunization against androstenedione shows an increase in the ovulation rate in ewes(1,2) and ovulation frequency with only small estrus abnormalities(3). On the other hand,

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active immunization of ewes against androstenedione has no significant effect on the frequency of estrus(3,4) or estrous cycle length in ewes(5).

Treatment with polyandroalbumin(an immunochemical composed of 4 - androstene-3-17 dione 7 alpha carboxy ethylth ether) conjugated with human serum albumin which is marketed as fecundin, immunizes ewes against androstenedione and increases the lamb crop (6,7). Hence in our study, poly androalbumin was used to study its effect on the estrus cycle, fertility, lambing percentage, lambing rate, fecundity and prolificacy.

MATERIALS AND METHODS

Our study was conducted on 110 nonpregnant, cyclic cross bred Hisardale x Nali ewes maintained at the Government Sheep Breeding Farm in Hisar from April 1986 to February 1987. The ewes were selected based on their records and on abdominal palpation, and they were then randomly divided into two equal groups of 55 ewes each.

Ewes in the treated group received 2 ml. of polyandroalbumin s.c. in the anterior neck region and were kept isolated from the males. Four weeks later, a booster dose of 2 ml. s.c. was administered to each ewe. Then 20 d later, both the treated and control groups of ewes were weighed and mixed together, and teaser rams were presented for detection of estrus during the morning and evening hours for 8 d. Breeding rams were introduced into the flock at the rate of 1:15 4 wk after the injection. The breeding of each ewe was recorded during the subsequent 40d period and the ewes were monitored during gestation and lambing. Fertility, lambing percentage lambing rate, fecundity and prolificacy of these groups were recorded. The statistical analysis of data was done by applying t-test (22).

RESULTS

The mean body weight of ewes was 34.14 and 32.53 Kg.in treated and control groups, respectively. The length of the estrous cycle was nonsignificant between treated(17.6 $\pm$ 0.31 d) and control(17.3 $\pm$ 0.15) group ewes. The number of ewes exhibiting estrus, mating, returning to estrus and the fertility rate at first cycle(first 20 d) and the second cycle (next 20 d) are presented in Table 1.

During first cycle, a higher number of ewes exhibited estrus and were mated(63.64) in the treated group than in the control group(56.36%), but the increase was nonsignificant. The fertility rate was nonsignificantly lower in the treated group(74.28%) than in the control group(80.64). During the second cycle, the same number(25) of ewes were mated in both the groups, but the fertility rate was nonsignificantly lower

Table 1. Occurrence of estrus and fertility at first and second cycle in control and treated groups

Group	No.of Ewes	First cycle				Second cycle		
		Ewes mated	Ewes lambed	Fertility %	Returned to heat	Ewes mated	Ewes lambed	Fertility %
Control	55	31 (56.36%)	25	80.64	4 (12.9%)	25	22	88
treated	55	35 (63.64%)	26	74.28	8 (22.8%)	25	20	80

in the treated group(80%) than in the control group(88%). Eight ewes(22.8%) in the treated group and four(12.9%) in the control group returned to estrus after the first cycle. The mating percentage for both the groups was the same (94.55%) with 52 of 55 ewes in each group exhibiting estrus and mating. The remaining three ewes in each group did not exhibit estrus at all within the 40d breeding period.

Fiftytwo ewes were mated in each group; of these 46 ewes in the treated group and 47 ewes in the control group lambed, resulting in the fertility rate of 88.46 and 90.38, respectively as presented in Table 2. However, the decrease in the fertility rate of the treated group was nonsignificant.

Of the 55 ewes in each group, a total of 46 and 47 ewes lambed, resulting in a lambing rate of 83.64 and 85.45% in the treated and control groups, respectively. A significantly ($P<0.01$) higher lambing rate(100 vs 85.45%) was observed in the treated group(55 lambs) than the control group(47 lambs). This increase in lambing rate was mostly attributed to twinning. The twinning percentage was 16.4% in the treated group; No twin births were recorded in the control group.

Fecundity and prolificity in the treated group was 96.36% and 1.15, while these values were 83.64% and 0.98 for the control group. The fecundity and prolificity were significantly($P<.01$) higher in the treated than in the control group.

DISCUSSION

The nonsignificant variations in estrus occurrence and length of the strous cycle in our study were in agreement with earlier reports(5,8). A higher return to estrus in treated ewes may be attributed to greater wastage of embryos in this group (9).

A decrease in the fertility rate with polyandroalbumin treatment has been reported previously. The decline may possibly have been due to a high embryo loss in immunized ewes (9), to a high rate of embryo failure to implant, or to resorption during early pregnancy (10,11). However, in our study, fertility did not decrease significantly; a possible reason may be that the breed used was not highly proliferative, thus the chance of reproduction wastage was also minimal. In highly proliferative breeds reproductive wastage increases linearly(11).

A similar lambing percentage for both groups in our study was also reported in an earlier study(11). Since polyandroalbum is not a treatment for anestrus, its use cannot

Table 2. Fertility rate, lambing percentage, lambing rate, fecundity and proficity in control and treated groups of ewes

Variables	Control group	Treated group
Total no.of ewes	55	55
Total no.of ewes mated	52	52
No.of ewes lambed	47	46
Total no. of lambs born	47	55
Fertility rate($\frac{\text{No.of ewes lambed}}{\text{No.of ewes mated}} \times 100$)	90.38	88.46
Lambing percentage($\frac{\text{No.of ewes lambed}}{\text{No.of ewes available}} \times 100$)	85.45	83.64
Lambing rate($\frac{\text{No. of lambs born}}{\text{No. of ewes available}} \times 100$)	85.45	100.00*
Fecundity ($\frac{\text{No. of lambs born alive}}{\text{No. of ewes available for mating}} \times 100$)	83.64	96.36*
Prolificacy ($\frac{\text{No. of live lambs born}}{\text{No. of ewes lambed}}$)	0.98	1.15*

*Significantly greater than control group values($P < 0.01$).

increase the lambing percentage. In our study, the singi ficant increase in the lambing rate of the treated group was due to 16.4% twin births in the treated group. Similar results have been reported by elsewhere (16); however, as even higher twinning rate has been observed (17, 18). The significant increase in fecundity and prolificity in the treated group in our study is similar to results of other researchers(1,17-19).

The increase in lambing performance in our study was due to twinning, and is in accordance with results of other researchers(18,20). This increasing lambing performance, (due to twinning) may indicate that immunized ewes ovulate only two follicles. Since it had also been reported that none of the New Zealand Romney ewes immunized against andro stenedione ovulated more than two follicles (13). However, an increase in the lambing rate was due to triple and quadru ple births in immunized group (21), the result of an increas ed ovulation rate(12-15) in various sheep breeds.

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THE EFFECT OF PMSG-PRIMING ON SUBSEQUENT SUPEROVULATORY RESPONSE IN DAIRY COWS

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Superovulation was induced in 56 dairy cows to evaluate the effect of two different regimens using pregnant mare serum gonadotropin (PMSG). Thirty-two cows (controls) were superovulated between Days 9 and 12 of the estrous cycle with a single dose of PMSG (2 800 IU), while remaining 24 cows (PMSG-primed) received 200 IU of PMSG on Day 4 of the estrous cycle and subsequently a single dose of PMSG (2 800 IU) between Days 8 and 12. The cows in both treatments were each given 0,5 mg of cloprostenol at 48 h after the superovulatory PMSG treatment. They were then artifically inseminated twice, 48 h and 72 h later. Embryos were recovered at sloughter between Days 2 and 5 of the cycle and morphologically evaluated. The number of corpora lutea (CL) in the ovaries of the cows was recorded. The mean number of CL (7.2 vs 17.8) was significantly higher (P 0.01) for PMSG-primed cows. The percentage of recovered ova (60.5 vs 70.2 %) and good embryos (79.3 vs 70.7%) were not significantly different between groups. The percentage of fertilized ova (91.4 vs 83.8%) was significantly (P 0.025) greater for the controls. Results of the study indicate that PMSG-priming increased the ovulation rate in the cows superovulated with PMSG.

Key words: dairy cows, PMSG, superovulation

INTRODUCTION

Several waves of folicular growth followed by subsequent atresia have been observed during the cycle of nonsuperovulated cattle (1-3). Ovaries at Days 8 to 10 appear to have the highest number of medium size follicles which respond most favourably to superovulation. It was hypothesized (4) that stimulation of preantral follicles by priming with gonadotropins to prevent their becoming atretic may be a practical and benefical procedure. The efficacy of this treatment was confirmed by Ware et al. (5) and Rajamahendran et al. (6) in follicle stimulating hormone (FSH)-primed heifers and cows. Rieger et al. (7), on the other hand, suggested that FSH-priming early in the cycle may be advantageous in promoting superovulation only when the superovulatory response of the population of cows is otherwise weak.