

THE SENSITIVITY OF OVARIAN AND OESTROUS ACTIVITY IN SOUTHDOWN EWES TO AN INTRAMUSCULAR INJECTION OF PREGNANT MARE SERUM GONADOTROPHIN

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The 'ram effect' can be used to stimulate ovulation within three days in anovular Merino ewes in spring (Oldham et al. 19778) but its efficacy is lower in Southdown ewes (Oldham et al. 1984). Therefore an experiment was conducted to determine the dose of pregnant mare serum gonadotrophin (PMSG) which must be used to induce ovulation with an acceptable ovulation rate in spring.

A group of Southdown ewes (n=111), two years and older, which had been maintained in isolation from rams had intravaginal sponges (Repromap, Upjohn) inserted on 18 Dec (day 0). On day 10 after sponge insertion rams (10%) were introduced to the ewes and at sponge withdrawal on day 12 they were harnessed and the ewes were allocated at random to PMSG treatment. The doses of PMSG were 0, 100, 200, 250, 300 or 350 iu, given as a single intramuscular injection. The PMSG had been previously standardised in a rat testis bioassay against a purified standard (Folligon, Intervet). Ovarian activity of the ewes was assessed by laparoscopy on day 18. Treatment effects were tested by analysis of variance.

TABLE 1 Effect of dose of PMSG on the ovarian activity of Southdown ewes

Dose of PMSG	0	100	200	250	300	350
n	21	20	18	20	19	13
Ewes ovulating (%)	71	100	94	100	95	100
Ovulation rate (%)	113	105	158	160	272	369
Ewes in oestrus of ewes ovulating (%)	73	50	59	80	89	92

PMSG was more effective than the 'ram effect' alone at inducing ewes to ovulate ($P<0.001$). Even a dose as low as 100 iu PMSG caused 100% of ewes to ovulate. PMSG had a significant effect on ovulation rate ($P<0.001$) but at the two highest doses was associated with overstimulation in some ewes (range of ovulations/ewe = 1-11). The dose of PMSG also significantly increased ewes displaying oestrus if the dose was higher than 200 iu (0-200 iu, 60% vs 250-350 iu, 86%; $P<0.01$).

The Southdown ewes in this experiment were extremely sensitive to PMSG. Only very small doses were required to induce ovulation and at higher doses ovarian stimulation exceeded that observed previously in Merino ewes (Gherardi and Lindsay 1980) and Border Leicester x Merino ewes (Evans and Robinson 1980). This sensitivity to exogenous gonadotrophins indicates that the poor response to the 'ram effect' was not due to an inability of the pituitary-gonadal axis to respond but that the ewes probably failed to respond to the 'ram effect' at the level of the brain. Similarly the poor oestrous response to doses of PMSG lower than 200 iu suggests a failure to respond at the behavioural centre of the brain. Although low doses of PMSG stimulated follicles to produce sufficient oestrogen to initiate a preovulatory surge of LH, oestrous activity increased only as the larger doses of PMSG increased the number of preovulatory follicles producing oestrogen.

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