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A STUDY OF THE OVARIAN RESPONSE OF NEW ZEALAND ROMNEY EWES
SEQUENTIALLY SUPEROVULATED WITH PREGNANT
MARE'S SERUM GONADOTROPHIN

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ABSTRACT

A series of experiments investigated the nature and causes of ovarian refractoriness in ewes sequentially treated with Pregnant Mare's Serum Gonadotrophin (P.M.S.G.). 70 ewes were subjected to the following treatments over 3 oestrous cycles of the 1972 breeding season:- 1. Injected with P.M.S.G. at each of 3 cycles (cycles 1,2 and 3);

2. Two injections of P.M.S.G. (at cycles 1 and 3) separated by a normal oestrous cycle;

3. Injected with P.M.S.G. at two successive cycles (cycles 2 and 3);

4. Injected at 1 cycle only (cycle 3).

These treatments were replicated at 1000 i.u. and 1500 i.u. P.M.S.G. and 9 ewes acted as an uninjected control group. The ewes were blood sampled and slaughtered at the end of these treatments and ovulation data were obtained by recovery of the reproductive tracts. The terminal ovulation rates showed that ewes were refractory to a second injection of P.M.S.G. and this condition persisted. The refractoriness was to some extent alleviated by the spacing of injections (Treatment 2 above).

Biological Inhibition Tests (using mice) analysed the plasma of the above ewes for evidence of anti-gonadotrophins. Although such factors were not detected in the blood of these ewes, the test did reveal antibody production against P.M.S.G. in the plasma of a further group of ewes which had been chronically treated with the hormone for 6 weeks. It was concluded that ovarian refractoriness, which is rapidly attained in sequentially treated ewes, is

not due to the development of serological antibodies against the exogenous gonadotrophin.

Another experiment, carried out early in the 1973 breeding season, investigated ovarian follicle development in 30 ewes which were sequentially treated with P.M.S.G. for up to 3 oestrous cycles. Ewes were laparotomised or killed on Day 10 of the oestrous cycles following treatment and measurements on follicle development were taken. A group of control ewes were observed at a similar time to the treated ewes.

Counts on ovarian surface follicles differed little between treated and control ewes, at each of the observations. However, the ovaries of slaughtered ewes were sectioned to allow estimation of total ovarian follicular populations and to make some assessment of follicular atresia. Ewes slaughtered after 1 injection of P.M.S.G. had lower numbers of normal antral follicles per ovary than did control ewes or ewes observed at similar times after 2 or 3 injections.

It was suggested that exhaustion of ovarian follicular populations may precipitate a refractory condition but that this condition persists because of an endogenous hormonal imbalance. Further work should be done to investigate this latter possibility.

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P R E F A C E

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