

# AN ASSESSMENT OF MULTI-STEROID IMMUNIZATION ON THE REPRODUCTIVE PERFORMANCE OF MAIDEN MERINO EWES

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Steroid immunization of adult Merino ewes has been established as a technique for increasing ovulation rates and lambing rates (Wilson *et al.* 1992). This study examined if a single immunization of Merino ewe lambs early in life, through mild and prolonged stimulation of ovarian function, would improve fertility of maiden Merino ewes at age 18 months.

A mixture of 3 steroid immunogens, androstenedione (A):human serum albumin (HSA), testosterone (T):HSA and oestrone (E):bovine serum albumin (BSA) in the ratio of 1:1:0.25, emulsified in Drakeol-Arlacel adjuvant (0.9 mg immunogen mixture/2 mL emulsion per animal) was used to immunize fine-wool Merino ewe lambs at Chiswick, Armidale. The first group of lambs from a 1990 lambing were immunized pre-pubertally in November 1990 at 6 weeks of age and the second group were immunized around puberty in May 1991 at 6 months of age. Blood samples for antibody titre measurement were obtained at 5 months after the immunization. The incidence of oestrus, as determined by use of vasectomised rams, was recorded from age 14 months until the ewes were mated with entire rams at age 18 months. The ovulation rate in a pre-joining cycle and the fertility of the immune groups were compared with that of non-immunized controls. Litter size was determined by ultrasound scanning at 60-77 days gestation. The experiment was then repeated using lambs born in 1991.

**Table 1. Immune response and reproductive performance of ewes**

Treatment Group	Ewes joined n	Reciprocal titre to			Mean ovulation rate		Oestrus (%)	Ewes with 0 1 2 fetuses			FA (%)
		A	E	T	n	OR					
<i>1990 Lambs</i>											
Control	40	-	-	-	39	1.13	93	3	36	1	93
6 weeks	45	328	22	1212	44	1.20	96	8	36	1	82
6 months	40	890	86	3184	38	1.34*	95	11	26	3	73*
<i>1991 Lambs</i>											
Control	78	-	-	-	72	1.01	89	17	60	1	78
6 weeks	79	581	212	2880	73	1.05	82	15	63	1	81
6 months	80	1474	219	5530	70	1.23***	76	23	56	1	71
*P < 0.05 *** P < 0.001, compared to control. A Fertility = (ewes pregnant/ewes joined) x 100.											

The steroid antibody responses were higher for the ewe groups immunized at 6 months of age, particularly for the testosterone titres. Ewes with 2 ovulations had higher antibody titres than ewes with a single ovulation (P < 0.05). In the immune groups, barren ewes had higher titres than ewes with a single fetus (P < 0.05). Immune ewes had higher ovulation rates but lower fertility than controls (Table 1). Incidence of oestrus was similar in all groups of ewes. In ewes immunized at 6 months of age, the lower fertility resulted from an increase in the number of barren ewes, suggesting that the immunization regime interfered with early embryo survival.

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