

**ACTIVE IMMUNIZATION AGAINST CORTISOL IN FEMALE CROSSBRED LAMBS  
DOES NOT ALTER GROWTH RATE OR BODY COMPOSITION**

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Elevated levels of cortisol inhibit growth and potentiate fat deposition and muscle catabolism in animals (Purchas 1973). A number of reports suggest that specific autoimmunity against a target hormone may reduce its biological activity. Here we report on the efficacy of immunizing growing crossbred lambs against cortisol and its effects on growth rate and body composition.

Border-Leicester Merino x Poll Dorset weaner lambs were vaccinated intramuscularly with an emulsion (3 ml) containing cortisol:human serum albumin (500 ug), Freund's complete adjuvant and saline (n=20) or vehicle alone (n=20) at 100, 170, 225 and 291 days (group mean age). Anti-cortisol antibody titres (i.e. 1/dilution of plasma) were made by radioimmunoassay (RIA) on plasma obtained via jugular venipuncture, on the day of vaccination and 7 days thereafter. Unfasted live weights were measured at approximately 28 day intervals. Half the animals were slaughtered at 35 kg and the remainder at 50 kg live weight. Chilled carcass weight was recorded after 16 h at 4°C. The 12th rib was exposed and photographed for analysis of eye muscle area and back fat.

Basal cortisol antibody titres (mean±s.e.m.) rose from 620±450 and 460±210 at 170 days to 23456 x 10<sup>3</sup> and 284±94 x 10<sup>3</sup> at slaughter for the 35 kg and 50 kg treated groups respectively. However, the cortisol specific immune response fluctuated, rising in response to vaccination over 7 days and declining to basal thereafter. The antibodies raised in these animals were specific for cortisol, with less than 15% cross reaction with related steroid hormones (e.g. cortisone; 12.1%) and no more than 1% binding to unrelated steroids (e.g. progesterone; 0.4%). At slaughter mean total blood cortisol levels, determined by RIA, of the cortisol immune group were approximately 2.9 x that of vehicle treated groups (172±33 and 59±12 ug/l, for cortisol and vehicle immune groups respectively), 79.3±4.7% of which was antibody bound. There were no detectable cortisol-specific antibodies in the vehicle treated group. Liveweight gains for 35 kg and 50 kg slaughter groups were 74.8±4.8 and 77.4±3.0 (cortisol immune) and 77.3±5.9 and 79.0±3.6 (control) (g/day) respectively, which were not significantly different. Carcass analysis revealed no significant differences between groups (Table 1).

Table 1 Effects of cortisol specific immunization on carcass characteristics

Slaughter groups:	35 kg		50 kg	
	Control	Immune	Control	Immune
Carcass weight (kg)	18.5±0.9	17.8±0.7	25.6±1.2	24.0±0.8
Eye muscle area (cm <sup>2</sup> )	11.0±0.8	10.9±0.5	15.3±0.7	12.9±0.4
Back fat (mm)	2.8±0.9	1.5±0.5	7.2±1.0	6.7±0.8

We therefore suggest that alterations in growth rate or carcass composition are not achievable with cortisol-specific antibodies in female weaner lambs.

PURCHAS, R.W. (1973). Aust. J. Agric. Res. 24: 297.

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