EFFECTS OF IMMUNISATION WITH SOMATOSTATIN ON GROWTH AND ARTERIO-VENOUS DIFFERENCES OF METABOLITES ACROSS MUSCLE TISSUE OF GROWING LAMBS

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There have been several reports that immunisation of growing lambs with somatostatin (SRIF) increases growth (Laarveld et al. 1986; Spencer 1986) and improved efficiency of utilisation of food has been reported (Spencer 1986). We report acute effects of immunisation against SRIF on growth rate and arterio-venous difference (A-LV) of metabolites in growing lambs.

Ten cross-bred lambs (Dorset x Border Leicester x Merino), c.25 kg liveweight and grazed at medium quality pasture, were immunised intra-muscularly 30 d apart with 2 ml of antigen - SRIF: Keyhole limpet haemocyanin conjugate (0.5 mg) emulsified in Freund's complete adjuvant. Some 20 d later, the 5 lambs with highest antibody titres and 5 non-immunised lambs were housed indoors and fed good quality lucerne chaff to support an estimated growth rate of 200 g/d. Each lamb was fitted with a polyvinyl chloride catheter in a deep femoral artery (A) and given a third injection of antigen 7 d later. After another 5 d, catheters were inserted in a deep femoral vein (LV) and a jugular vein. Lambs were kept in metabolism cages and fed continuously. Measurements of metabolites, hormones and tissue blood flow were made 10 d, and growth rate was measured over 15 d, after the third injection of antigen.

Mean (n=5) values for initial liveweight, anti-SRIF antibody titre, plasma hormones plasma/blood metabolites in arterial blood (A), arterio-venous differences across leg muscle tissue (A-LV) and blood flow to leg muscle tissue in control (NI) and immunised (I) lambs

	NI	I			NI	I
initial L. wt. (kg)	34.0	35.0	plasma glucose	A	3.80	3.75
antibody titre	0	9003***	(mM)	A-LV	0.18	0.16
growth rate:			plasma FFA	A	214	229
- absolute (g/d)	251	364*	(µm)	A-LV	3	-30
- relative (g/kg)	108	153**	blood lactate	A	0.75	0.67
plasma hormone:			(mM)	A-LV	0.01	-0.01
- insulin (ng/ml)	2.6	2.9	blood acetate	A	1.18	1.03
- GH (ng/ml)	3.2	2.3	(mM)	A-LV	-0.44	0.05
blood flow to leg			blood 3-OH-	A	0.26	0.23
muscle (ml/kg/min)	112	108	butyrate (mM)	A-LV	0.09	0.12

*P<0.2, **P<0.1, ***P<0.001

Immunised lambs had high levels of circulating antibodies and exhibited higher growth rates than control lambs. In spite of this no differences, between immunised and control lambs, were measured for tissue blood flow, plasma hormones, metabolite concentrations or tissue uptakes of metabolites. Similar observations were made by Laarveld et al. (1986) who showed that immunisation with SRIF increased growth without affecting plasma glucose, insulin or growth hormone or responses to intravenous challenge with glucose or arginine.

It is possible that immunisation with SRIF affected digestive efficiency as suggested by Laarveld et al. (1960), affected nutrient utilisation and/or affected function of endocrine glands (e.g. adrenal, thyroid).

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