

THE EFFECTS OF OVINE GROWTH HORMONE ON LIPID METABOLISM OF ISOLATED
OVINE SUBCUTANEOUS ADIPOCYTES

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In acute experiments on isolated ovine subcutaneous adipocytes we have demonstrated that clenbuterol, a β_2 adrenergic agonist, decreased the rates of lipogenesis and long chain fatty acid incorporation into lipid and increased lipolysis rates (Thornton et al. 1985a; Thornton et al. 1985b). These results suggest a mechanism for decreased fat deposition, but cannot explain the increased muscle deposition, in sheep injected with clenbuterol (Thornton et al. 1985b). It has been suggested that clenbuterol increases growth hormone level in sheep and that this may account for the repartitioning effects of clenbuterol (Ricks et al. 1984). Here we report studies on the acute effects of growth hormone, together with some chronic effects of clenbuterol, on lipid metabolism of isolated adipocytes.

The effects of ovine growth hormone (OGH) and clenbuterol (CB) on lipid metabolism of isolated ovine subcutaneous adipocytes

	Final OGH and CB Conc. per Incubation (ng/ml)						LSD (p<0.01;n=9)
	0	0.1	1.0	10	100	1000	
Acetate Incorporation - Lipogenesis							
OGH:Control Sheep	2.6	2.5	2.3	2.2	1.7	1.8	0.55
CB:Control Sheep	2.9	2.6	2.2	1.2	0.8	0.7	0.70
CB:Treated Sheep	2.9	2.8	2.3	1.2	0.8	0.8	0.59
Glycerol Release - Lipolysis							
OGH:Control Sheep	0.03	0.09	0.07	0.15	0.21	0.21	0.60
CB:Control Sheep	0.20	0.14	0.43	1.31	1.83	1.81	1.19
CB:Treated Sheep	0.05	0.07	0.43	1.98	2.53	2.55	0.90

All values are expressed as μ moles/g lipid/hr. Control sheep were injected with physiological saline. Treated sheep were injected with clenbuterol (2.5 μ g/kg/day) in physiological saline. Each incubation contained about 10^5 adipocytes in 1.2 mls - methods used were as described by Thornton et al. (1985b).

From the table it can be seen that adipocytes from control and clenbuterol treated sheep showed similar rates of lipogenesis and lipolysis at all concentrations of clenbuterol in the incubation medium. High, unphysiological concentrations of growth hormone (>10ng/ml) depressed lipogenesis but were without significant effect on lipolysis rates. It appears that clenbuterol exerts an exaggerated growth hormone like response on the lipid metabolism of adipocytes. The in vivo responses of ovine adipose tissue to chronic clenbuterol injection seem unlikely to be mediated through growth hormone levels.

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