

GLUCOSE ENTRY RATES IN EWES GIVEN INTRAVENOUS
INFUSIONS OF GLUCOSE OR ACETATE

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Ovulation rate in ewes can be increased by supplementary feeding with lupin grain. In two experiments Teleni et al (1984, 1985) demonstrated that similar increases in ovulation rate as observed with lupin feeding could be achieved in response to intravenous infusions of a mixture of glucose (525 mmol/d) and acetate (1122 mmol/d) or either metabolite on its own. The aim of the experiment reported here was to measure the changes in glucose entry rate in response to infusions of acetate and glucose as part of a study to investigate the mechanisms by which nutrition affects ovulation rate.

There were five anoestrus ewes of similar mean liveweight (46.7 kg, 0.6 SE) in each of three treatment groups. All groups were fed 700 g/d of a pelleted diet containing (g/kg) cereal hay (540), oats (400), fishmeal (40) minerals + vitamins (20). One group received an intravenous infusion of glucose, another acetate and the third group (controls) received no infusion. The infusion solutions were made up in sterile water and infused (0.24 ml/min) for 10 d. Glucose entry rates were measured in all sheep on days 6 and 10 of the infusion using a single injection of [6-³H] glucose (150 μ Ci in 10 ml sterile saline 0.9 gNaCl/l).

	Infusion	Treatment (Infusion)			SED
		Control	Glucose	Acetate	
Glucose entry rate	6	21.3 ^a	36.4 ^b	36.6 ^b	2.3
(mmol/h)	10	17.9 ^a	34.3 ^b	42.5 ^c	1.8
Blood glucose =	6	2.86	3.22	3.16	0.46
(mmol/l)	10	2.82 ^a	3.37 ^b	2.78 ^a	0.23

The intravenous infusion of both glucose and acetate increased glucose entry rate ($p < 0.001$). Blood glucose concentration was higher in animals infused with glucose on day 10. It is likely that the additional acetate is extensively used for lipogenesis and that the higher glucose entry rate on this treatment is associated with the requirements for glucose to provide the glyceride portion of triglycerides and NADPH (Vernon 1981). It is interesting that endogenous glucose production increased in this way without additional substrate for gluconeogenesis. It is not clear how the animal uses and disposes of the additional glucose provided through the infusion.

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