

THE EFFECT OF INTRAVENOUS INFUSION OF GLUCOSE ON GLUCOSE
ENTRY RATE IN SHEEP

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Short periods of intravenous glucose infusions of glucose have been shown to depress endogenous glucose production (West and Passey 1967). As a preliminary to a major study on the relationship between amino acids and various energy-yielding substrates as they affect protein metabolism in growing ruminants, this study investigated the effect of a longer period of intravenous infusion of glucose on endogenous glucose entry.

Four wethers (mean liveweight:24 kg) each prepared with chronic indwelling catheters in the left and right external jugular veins, were continuously fed lucerne chaff in metabolism cages at calculated maintenance energy level. The animals were infused continuously with sterile physiological saline for two days and thereafter with a solution of glucose at the rate of 21.8 m mol/h for six days and again with saline on the seventh day. Measurements of glucose entry rates were made, using constant infusion of D-[6-³H]glucose, on the second day of saline infusion (day 0) and at the same period each day for the next seven days. All infusions were made into one of the venous catheters and blood samples taken from the other.

Mean values of glucose entry rate (GER) and plasma insulin and urea concentrations during continuous intravenous infusion of either saline or glucose.

	Days of infusion							
	Saline		Glucose				Saline	
	0	1	2	3	4	5	6	7
GER (m mol/h)	23	38	38	42	46	47	47	22
+ SEM	1	1	1	3	4	3	3	1
Insulin (ng/ml)	11	58	35	27	19	10	6	15
+ SEM	4	10	6	6	7	2	4	6
Urea (mg/100ml)	42	36	32	30	30	26	24	35
+ SEM	1	3	4	4	4	5	4	7

The infusion of glucose into the peripheral circulation lowered endogenous entry of glucose by 34% on day one and two, by 18% on day three but by day four onwards endogenous glucose entry had returned to normal levels. The latter coincided with return to normal values of plasma insulin, which, on the first day of glucose infusion reached its peak value and subsequently declined. Plasma urea concentration declined with ensuing days of glucose infusion suggesting an improvement in amino acid utilisation.

It might be assumed from this study that the depression in endogenous glucose entry is a transient effect of exogenous glucose loading and that with longer periods of glucose infusion this effect is likely to disappear.

WEST, C.E. and PASSEY, R.F. (1967). *Biochem. J.* 102: 58.

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