Sources of Carbon for Hepatic Glycogen Synthesis in the Conscious Dog

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way contribution (see Discussion). The weights of the animals ranged from 18.7 to 23.9 kg (mean±SEM 21.2±0.8 kg). They were maintained

cess took no more than 10 min from the time of sacrifice. The position of the catheter tips was then verified to ensure proper placement.

[redacted]

Diet No. 5006, Ralston Purina Co., St. Louis, MO) composed of 34% [redacted] after a 42-h fast, and liver samples were taken just as in the experimen-

blood glucose values per se, but the variance was reduced because of the accuracy of plasma glucose A-V differences, which do not require a deproteinization step. The use of whole blood glucose ensures accurate

Results

Blood glucose concentrations: hepatic glucose load balance.

cose entry into the erythrocyte.

portal vein whole-blood glucose levels, arterial and portal vein

Intraduodenal Glucose Infusion

Mean net hepatic lactate uptake during the control period was

150

Several previous investigations have examined the disposition

within the glucose space, leaving 44% of the net absorbed glucose, or 13 g, to be disposed of by nonhepatic tissues. If the

Table II. Comparison of Net Hepatic Balance of Gluconeogenic Substrates with Net Hepatic Glycogen Synthesis and NMR-determined

Contribution of the Direct Pathway during the Glucose Infusion Period

Dog no.	carbon*	lactate	C_1	C_6	PV glucose	CF	pathway	synthesis
	g of glucose equivalents/100 g liver						%	*g/100 g liver*

synthesis are not clear. Although there were no correlations between hormonal levels and changes and the pathways of glycogen synthesis, it is notable that dog 3, which had an unusually large mass of glycogen deposited via the direct pathway, experienced an increase in plasma insulin concentration (to a level that was fourfold the mean of the other dogs) during the final hour of the glucose infusion.

The current data are consistent with the hypothesis (33) that the three-carbon substrates used for glycogen synthesis by

A second possibility is that lactate carbon was derived from nonhepatic tissues. This implies that there was uptake of lactate by the liver, even though there was net lactate output, suggesting that the total hepatic lactate production was greater than the net production. Net balance measurements underestimate absolute uptake or production of substrates which are both taken up and released by an organ, since they reflect the quantitatively dominant process. Thus, we cannot rule out this explanation of our findings. The lactate being taken up by the

case in our animals. Nevertheless, these investigators con-

splanchnic carbohydrate and substrate metabolism in healthy man. *Metab. Clin.*

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