

Glycogenolysis in liver slices of lactose-fed rats

Liver glycogen is known to increase after lactose feeding^{1, 2} and disappears in galactose-fed dogs more slowly than in glucose-fed animals¹. It has also been noted that a hyperglycaemic state prevails in lactose-fed rats due to the presence of galactose in addition to glucose in blood³. It is possible that hyperglycaemia in lactose feeding is responsible for the slowing down of liver glycogen breakdown.

In the present investigation the rate of liver glycogenolysis of lactose-fed rats and of normal rats has been studied *in vitro* in a sugar-free medium.

Albino rats weighing between 35 and 40 g were divided in two groups. Group I was fed a diet containing 70 % sucrose, 15 % casein, 5 % cod-liver oil, 5 % cocoanut oil, 4 % salt mixture⁴ and 1 % yeast. In group II, 50 % sucrose and 20 % lactose replaced the 70 % sucrose. Feeding was continued for 30 to 37 days, when the rats were sacrificed and the rate of liver glycogenolysis was measured according to the method of SUTHERLAND AND CORI⁵.

Results given in Table I show that the rate of glycogenolysis in liver is slower in group II than in group I. Mean values of glucose liberation in 40 min by 100 mg liver tissue were 0.701 ± 0.036 mg and 0.406 ± 0.060 mg for groups I and II, respectively. Hence, it is concluded that in lactose-fed rats glycogenolysis in liver is slow even in a sugar-free medium indicating that slowing of liver glycogenolysis in lactose-fed rats is not due to the hyperglycaemic condition prevailing.

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TABLE I
RATE OF GLYCOGENOLYSIS IN LIVER SLICES FROM RATS FED NO LACTOSE (GROUP I) OR
FED 20 % LACTOSE FOR A PERIOD OF 30 TO 37 DAYS (GROUP II)
8 rats in each group. Values are means \pm standard deviation.

Group	Glycogen (mg/100 mg liver tissue)	Glucose liberation (mg/100 mg liver tissue)			Glucose liberation (mg/40 min—a to c)	Glucose liberation (mg/mg of initial glycogen content/ 40 min—a to c)
		20 min (a)	40 min (b)	60 min (c)		
I	1.564 ± 0.06	0.66 ± 0.14	1.06 ± 0.06	1.39 ± 0.08	0.701 ± 0.036	0.448 ± 0.02
II	1.903 ± 0.08 F = 15	0.54 ± 0.10	0.77 ± 0.10	0.94 ± 0.11	0.406 ± 0.060 F = 12	0.213 ± 0.03 F = 35

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