

val of about eighteen hours between the last meal of the sheep and the beginning of each experiment.

This interval was varied and a longer fast was instituted. Under the changed conditions, the normal sheep showed a flat bottom in the insulin blood sugar curve after the administration of the standard dose.

On the other hand, when the thyroidectomized sheep were allowed free access to food during the night preceding the experiment, blood sugar curves were obtained indistinguishable from the curves of normal animals which had been given the same dose of insulin but had been submitted to the standard eighteen hours' fast.

Further observations are in progress—of the effect of dosage and of diet, and of the relative importance of the general cachectic factor and of the specific endocrine deficiency in the control of the blood sugar after insulin administration.

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The influence of insulin on the liver glycogen of animals poisoned with phlorhizin.

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It has been shown previously¹ that insulin produces a marked diminution in the sugar excretion of rabbits completely poisoned with phlorhizin, whereas the nitrogen excretion during an observation time of four hours is not appreciably diminished. It was concluded that insulin does not directly influence the sugar formation from proteins during phlorhizin poisoning. Since a rather large amount of sugar is retained when phlorhizinized

¹ Cori, C. F., *J. Pharmacol. and Exp. Therap.*, 1924, xxiii, 99.

rabbits are treated with insulin, it was assumed that part of this sugar is stored as glycogen. This seemed the more probable, since Ringer,² in a recent publication, showed that completely phlorhizinized dogs which excrete less sugar during the action of insulin give rise to the excretion of extra sugar when the action of insulin has worn off.

Six experiments were undertaken in which four rabbits and two cats were used. In all animals glycogen synthesis could be demonstrated. The glycogen was determined by Pflüger's method or by the total carbohydrate method. One protocol is given below. The experimental methods have been described elsewhere.³

Rabbit 3. February 1, 1924, abdominal window established; food withdrawn. February 4, first phlorhizin day. February 5, second phlorhizin day. February 6, day of experiment.

Time	Blood sugar mg. per 100	Total carbohydrates in liver gm. per 100	Sugar : Nitrogen ratio in urine	Amount of liver taken in gm.
9:30	105	0.87	2.78	1.99
9:40	4 units insulin (Lilly) subcutaneously			
12:40	92	1.80	2.53	2.07
1:00	4 units insulin subcutaneously			
3:40	88	3.61	1.91	2.16
8:00	76	3.25	2.58	1.46
The next day				
12 a. m.	118	1.39	3.35	3.14

As will be seen from this table a marked glycogen synthesis occurs, which reaches its maximum in six hours, while the D:N ratio falls to 1.91. After the insulin injections have been discontinued the glycogen accumulated in the liver disappears gradually again, giving rise to extra sugar in the urine.

² Ringer, M., *J. Biol. Chem.*, 1923, lviii, 483.

³ Cori, C. F., Cori, G. T., and Pucher, G. W., *J. Pharmacol. and Exp. Therap.*, 1923, xxi, 377.