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Glycogen Formation in the White Rat After Oral Administration of Xylose.

MABEL M. MILLER AND HOWARD B. LEWIS.

From the Laboratory of Physiological Chemistry, Medical School, University of Michigan, Ann Arbor.

Recent investigations on the preparation of the pentose, xylose, have made this sugar, formerly one of the rare carbohydrates, available at a very moderate price. It has been suggested that xylose may be utilized in human nutrition as a "non-fattening sugar." The renewed interest in xylose occasioned by its ready availability in pure form again raises the question of its rôle in nutrition. Although most of the literature would indicate that xylose ingestion does not lead to increased formation of liver glycogen, the question of its behavior in this respect is still an open one. We have accordingly studied the rate of absorption of xylose and the formation of glycogen from it in the young white rat.

The xylose was prepared from cottonseed hulls and was given to us by the Bureau of Standards and by Dr. J. L. Kassner of the University of Alabama, to whom we take this opportunity to express our indebtedness. The material as received was recrystallized from alcohol, dried at 40° in the oven and then in a desiccator for several weeks. The method of study was that of Cori as previously used in this laboratory for the study of the absorption of and glycogen formation from amino acids.[1]

The results are presented in tabular form and require little comment. After the absorption of xylose over periods of 1, 2 and 3 hours, there was no significant change in glycogen content of the liver or the entire body (Groups 2, 3, 4) as compared with the control fasted animals (Group 1). Glucose administered in amounts comparable to xylose resulted in a marked deposition of glycogen after an absorption period of 3 hours (Group 5). Since, however, glucose was absorbed much more rapidly than was xylose, it seemed possible that glycogen formation might not result from *the absorption of glucose in amounts comparable to the amount of xylose actually absorbed* as shown by the experimental data. Accordingly a second group of glucose controls (Group 6) received an amount of glucose such that the amount absorbed (47.4 mg. per

[1] Wilson, R. H., and Lewis, H. B., *J. Biol. Chem.*, 1929, **84**, 511; 1929-30, **85**, 559.

TABLE I.

	No. of Animals	Absorption per hr. per 100 gm. rat Average mg.	Glycogen	
			Liver Average %	Entire Body Except Liver Average %
1. Fasting Controls	11		0.105 (0.074-0.170)	0.051 (0.042-0.075)
2. Xylose, 1 hr.	6	29.3 (23-34.1)*	0.157 (0.092-0.262)	0.053 (0.045-0.061)
3. Xylose, 2 hrs.	6	39.9 (24-54)	0.129 (0.094-0.186)	0.061 (0.042-0.080)
4. Xylose, 3 "	12	46.7 (32-74)	0.134 (0.060-0.185)	0.059 (0.039-0.073)
5. Glucose, 3 hrs.	8	163.9 (144.4-205.4)	1.916 (1.149-2.997)	0.153 (0.095-0.251)
6. Glucose, 3 " fed at level of xylose absorption	11	47.4 (41.8-54.1)	0.604 (0.459-0.725)	0.088 (0.075-0.101)

* The figures in parenthesis indicate the ranges observed in the individual experiments.

hour per 100 gm. of rat) over a period of 3 hours was similar to the amount of xylose absorbed in a like period (46.7 mg. per hour per 100 gm. of rat). A significant glycogen formation in the livers of this group was also observed, the average figure being 4 to 5 times greater than that of the control fasting rats or the rats receiving xylose. This would seem to indicate that xylose *in the amounts actually absorbed* should cause a significant deposition of glycogen if glycogen formation from it occurred readily. We must therefore conclude that xylose, under our experimental conditions, is not readily available for the formation of glycogen.

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Nature of the Agent Transmitting Leucosis of the Fowl.*

J. FURTH.†

From the Henry Phipps Institute, University of Pennsylvania, Philadelphia.

The studies of Ellerman and Bang,[1] Furth[2] have shown that the agent transmitting leucosis of fowls passes bacteria-tight Berkefeld

* This investigation has been supported by a Fund for the Study of Leucemia and Related Diseases.

† With the assistance of Charles Breedis.

[1] Ellermann, V., The Leucosis of Fowls and Leucemia Problems, London, 1921.

[2] Furth, J., *J. Exp. Med.*, 1931, **53**.