

tracted with ether and then evaporated, *in vacuo*, to 100 cc. In a 1 dm. tube, the rotation was 1.18° . Since the calculated yield of pentose was 3.39 gm, $[\alpha]_D^{22} = 34.8^\circ$. The glucose equivalent of 1 gm. of pentose, calculated from the *p*-bromophenylhydrazone was 1.25 gm. by Sumner's method,⁵ 1.45 gm. by the NaOH-picrate-acetone method⁶ and 1.18 gm. by the Na_2CO_3 -picrate method.⁷

This solution was injected into a young female dog, weighing 5.6 k., kept on a diet of 100 gm. beef heart, 16 gm. cracker meal, 16 cc. maize oil, 6 gm. bone-ash and 200 cc. water. There were 4 injections of 20 cc. and a fifth one of 10 cc., at intervals of approximately 2 hours. Calculated from the amount of hydrazone taken, the total amount of pentose injected was 3.05 gm. By Sumner's method, this showed a reducing action equivalent to that of 3.80 gm. glucose. The increase in the sugar content of the urine was equivalent to about 6% of the amount injected. A few days later, the animal received a similar series of injections of *l*-xylose. About 60% appeared in the urine. Another control experiment with glucose, gave, as was expected, no increase in the excretion of sugar.

d-Xyloketose is, therefore, not a substance that cannot be further metabolized by the organism. Whether or not it is a product of normal metabolism and what its action in insulin hypoglycemia, phlorhizin diabetes, etc., may be, are yet to be determined.

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Influence of Whole Wheat upon Hemoglobin Regeneration in Albino Rats.

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Young rats from mothers on a uniform diet (Sherman's Diet 13, consisting of one-third whole milk powder and two-thirds ground whole wheat plus common salt equal to 2% of the weight of the wheat with meat and lettuce 3 times a week) have been made anemic by exclusive feeding of fluid milk (pasteurized) from time of wean-

⁴ Sumner, J. B., *J. Biol. Chem.*, 1925, lxxv, 395.

⁵ Benedict, S. R., *J. Biol. Chem.*, 1925, lxxiv, 207.

⁶ Benedict, S. R., and Osterberg, E., *J. Biol. Chem.*, 1921, xlvi, 51.

⁷ Benedict, S. R., and Osterberg, E., *J. Biol. Chem.*, 1918, xxxiv, 194.

ing. At first all the animals were weaned at the age of 4 weeks, but in order to hasten the development of anemia, weaning at 3 weeks is now being done and 2 of the animals reported in this paper were so weaned.

Hemoglobin determinations have been made at intervals of approximately one week except immediately after weaning, when an interval of about 2 weeks was allowed to give time for the anemia to develop. The Newcomer method with the Newcomer disk,¹ having an accuracy of 5%, has been used, all determinations being done by 2 independent workers taking samples at the same bleeding. These readings have all agreed within the limits of experimental error. All colorimetric readings have also been checked by both observers.

When repeated hemoglobin determinations showed that the percentage in the blood had fallen to approximately half the amount normal for the age, as determined by Williamson and Ets,² one-half of the animals were continued on the milk diet as controls while the others were fed daily 6 gm. of whole wheat containing 0.2 mgm. of iron as determined by the Zimmermann-Reinhardt method³ by 2 independent analysts. The animals ate the wheat well and were also supplied with fluid milk *ad libitum*.

The control rats, fed milk exclusively, have shown progressive lowering of the blood hemoglobin, in 11 weeks falling to values between 5.8 and 4.5 gm. per 100 cc. of blood.

The wheat-fed rats were tested weekly after the wheat feeding had been initiated. Starting with values ranging from 4.7 to 7.5 gm. of hemoglobin per 100 cc. of blood, there was a sharp rise, usually by the end of the first week, followed by a more gradual increase. Feeding was continued until the hemoglobin of the blood had risen to a figure above normal for the age and had remained high for several consecutive weekly readings. Values then ranged between 15 and 19 gm. per 100 cc. of blood. In no case have we failed to get a return to a figure above normal, whereas all the controls have continued to decline.

This is a part of a study of the place of whole-grain cereals in the diets of normal children.

¹ Myers, Victor C., "Practical Chemical Analysis of Blood," 2nd Edition, 1924, 167.

² Williamson, C. S., and Ets, H. N., *Am. J. Physiol.*, 1926, lxxvii, 480.

³ Fales, H. A., "Inorganic Quantitative Analysis," 1925, 330.