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The Bacteriological Determination of Lactose in Blood.

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The difference between the action of *B. coli communis* and *B. paratyphosus* upon lactose, as contrasted with the similarity of the effect of these organisms upon all other common sugars has been known for a long time, and has been utilized by Castellani[1] for showing the presence of lactose in urine. In the work reported in the present communication this fermentation reaction is applied to the demonstration and approximate determination of that sugar in blood.

Plasma was precipitated by the method of Folin and Wu,[2] brought to a slight degree of alkalinity by the addition of a phosphate buffer mixture, and sterilized in a boiling water bath. It was then divided into 2 parts, one of which was inoculated with *B. coli communis,* and the other with *B. paratyphosus A.* Both preparations were incubated for 24 hours at body temperature. They were then again immersed in a boiling water bath, the organisms removed by centrifugalization, and the residual reducing power determined by a method already described.[3] In a great majority of the blood

[1] Castellani, A., and Taylor, F. E., *Brit. Med. J.*, 1917, **2**, 853; 1919, **1**, 183; Castellani, A., *J. Am. Med. Assn.*, 1928, **90**, 1773.

[2] Folin, O., and Wu, H., *J. Biol. Chem.*, 1919, **38**, 81.

[3] Hubbard, R. S., and Allison, C. B., PROC. SOC. EXP. BIOL. AND MED., 1928, **25**, 408; *Clifton Med. Bull.*, 1928, **14**, 35.

samples taken before breakfast, identical results, within the limits of the colorimetric method, were obtained with the two organisms. Lactose added to blood to give concentrations of 0.1 to 0.005% was completely removed by *B. coli communis* and was not affected by *B. paratyphosus A.* Glucose, levulose, maltose, and galactose added to blood to give concentrations of 0.1% additional sugar were completely destroyed by both organisms. In spite of these experiments it cannot be positively stated that a difference between the reducing power of filtrate inoculated with the two organisms is due to lactose, but it seems very probable that this will be true in a great majority of instances. Because of this uncertainty it seems best to express results in terms of the glucose equivalent of the reducing power. The accuracy of the determinations of the smaller amounts studied was low, as it was not possible to read each final result with a greater accuracy than a glucose equivalent of 0.001%.

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A Biological Method for the Assay of Cortin.

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No satisfactory method for the assay of cortin has been available. The survival and behavior of adrenalectomized cats is unsatisfactory as it requires too much time and too much cortin.

The white rat is more satisfactory because less cortin is required and a large number of animals may be used. The animals which do not need cortin can be ruled out by employing a sufficiently large number. Young rats (50-150 gm. weight) fail to gain weight, or even lose, after removal of both adrenals. The injection of sufficient cortin enables these animals to grow and develop normally. If the cortin is inadequate a majority fail to gain or may even lose within 1 to 3 days. This forms a basis for the test.

From observations on a considerable series of adrenalectomized rats we have developed the method which follows. Male or female white rats, of standard stock, weighing between 75 and 150 gm. are used. Both adrenals are removed through the lumbar path at one operation. They are fed a uniform standard diet and are weighed in the morning at the same time each day. When not being used for assay their growth is maintained by the injection of ade-