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Effect of Potassium Iodide on Basal Metabolism in Guinea Pigs.

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Marine, Deutsch, and Cipra,[1] using an open circuit respiratory calorimeter of the Haldane type,[2] found that KI feeding to 18 normal rabbits caused a drop in the metabolic rate in 5, a slight increase in rate in 2, and no appreciable change in 11. Employing the same apparatus, Webster and Chesney[3] found, following the first dose of Lugol's solution, a decrease in basal metabolism in rabbits, which attained a maximum on the third day, with a subsequent tendency to a return to normal. Cordonnier[4] in our laboratory, using an apparatus devised by Foster and Sundstroem,[5] found that oral administration of KI over a 30 day period produced no appreciable effect on the average basal metabolic rate in 10 normal guinea pigs, though there were individual variations both above and below the normal averages.

Loeb,[6] Loeb and Gray,[7] and Rabinovitch,[8] have studied the effects of KI feeding upon compensatory hypertrophy and upon the structure of the thyroid gland in guinea pigs. They found that there is a marked increase in the number of mitotic figures and a slight softening of the colloid, with a slight increase in the height of the epithelium at a certain time during the period of feeding. Inasmuch as the apparatus used by Cordonnier gave somewhat variable results we decided to repeat the study of the effect of KI on basal metabolism in guinea pigs using the Haldane apparatus,* which gives much less variable results in control animals.

In 8 control guinea pigs weighing between 340 and 500 gm., we found that the basal rate of metabolism of the individual animal,

[1] Marine, D., Deutsch, M., and Cipra, A., PROC. SOC. EXP. BIOL. AND MED., 1927, xxiv, 657.

[2] Haldane, J. A., *J. Physiol.*, 1892, xiii, 419.

[3] Webster, B., Chesney, A. M., *Johns Hopkins Hosp. Bull.*, xliii, 291.

[4] Cordonnier, J., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 636.

[5] Foster, G. L., and Sundstroem, E. S., *J. Biol. Chem.*, 1927, lxix, 565.

[6] Loeb, Leo, *J. Med. Research*, 1920, xli, 481; *Am. J. Path.*, 1926, ii, 19.

[7] Loeb, Leo, and Gray, S. H., *Am. J. Path.*, 1928, iv, 257.

[8] Rabinovitch, Jacob, *Am. J. Path.*, 1928, iv, 601.

* We are indebted to Dr. Ethel Ronzoni for advice and assistance in the use of the apparatus.

recorded in calories per kilo per hour, varied within ±7.5% of the average rate for that animal. The average basal metabolic rates of these normal animals varied, however, between 3.22 and 4.09 calories per kilo per hour.

In 8 guinea pigs weighing between 340 and 500 gm. we found that daily oral administration of KI in 0.1 gm., 0.05 gm., and 0.01 gm. doses, over a 25-day period caused a definite, although not very great, increase in the basal rate of metabolism in 2 animals; a variation within the upper range of the normal metabolic values in one animal; a variation falling in the lower range of the normal metabolic curve in one animal; and, in 4 animals, variations in the basal metabolic rate corresponding to the average variations found in the controls. Of the 2 animals which showed an increased caloric output, one showed an increase of approximately 20% above the normal range of values in the first 10 days; the other showed a rise of approximately 10% above the range of variation of the controls, which occurred between the tenth and twentieth days. The average basal metabolic rate of all the KI fed animals was slightly above the average of the 8 control animals. All animals gained in weight throughout the experiment. No correlation was to be noted between the doses of KI given and the changes in the basal metabolism.

Our results, therefore, agree essentially with those of Cordonnier. From our determinations, it would appear that in guinea pigs, as in rabbits, the effect of oral administration of KI on the basal metabolic rate may be variable, and is not very great. In our experiments, however, KI feeding in guinea pigs tended to cause a slight increase in the basal metabolic level, rather than a decrease.

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Titrimetric Measurement of Fermentation.

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The fact that yeast in high concentration ferments glucose very rapidly has been put to considerable use in the analysis of blood and other biochemical material. The fermentation can be so regulated that small quantities of glucose are completely broken down in a few minutes at room temperatures. The evolution of CO_2 takes