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The rate of absorption of a mixture of glucose and galactose.

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Previous work[1] has shown that each sugar has its own characteristic rate of absorption from the intestine and that this rate remains constant. Glucose was found to be absorbed at a rate of 0.178 gm. per 100 gm. of body weight per hour, galactose at a rate of 0.196 gm. per 100 gm. of body weight per hour. It seemed of interest to study at what rates glucose and galactose would be absorbed if a mixture of these two sugars was fed.

Experimental.

The method for the quantitative study of intestinal absorption has been described on a previous occasion.[1] A 60 per cent sugar solution, consisting of equal parts of glucose and galactose, was fed. The concentration of the two sugars in the same solution was determined in the following way. First the total sugar content of the solution was found. Glucose was then removed by fermentation with yeast. The sugar remaining in the fermented solution corresponded to the amount of galactose present. The amount of glucose present was calculated by difference.

TABLE I.

The rate of absorption of a mixture of equal parts of glucose and galactose. The rats were killed 2 hours after the sugar feeding.

Body weight.	Blood sugar.	Absorption coefficient* for glucose.	Absorption coefficient* for galactose.	Total absorption* coefficient
gm.	per cent.	gm.	gm.	gm.
137.8	0.217	0.118	0.086	0.204
145.3	0.200	0.103	0.065	0.168
155.4	0.246	0.109	0.079	0.188
160.5	0.213	0.108	0.062	0.170
121.7	0.221	0.101	0.078	0.179
136.9	0.242	0.097	0.070	0.167
117.0	0.170	0.122	0.077	0.199
Average:	0.215	0.108	0.074	0.182

*The absorption coefficient is the amount of sugar absorbed per 100 gm. of body weight per hour.

[1] *J. Biol. Chem.*, 1925, lxvi, 691.

It will be seen from Table I that the rate of absorption of glucose and galactose is considerably reduced if both sugars are absorbed simultaneously. We may speak of a mutual inhibition. The absorption of glucose taking place simultaneously with the absorption of galactose, inhibits the rate of absorption of the latter sugar and *vice versa*. If such an inhibition did not exist, the organisms would be flooded with sugar, whenever a mixture of two or more sugars is fed. If glucose alone is fed 0.178 gm. are absorbed per 100 gm. per hour; if galactose alone is fed 0.196 gm. are absorbed per 100 gm. per hour. This would make a total amount of 0.374 gm. sugar, if the same rate would prevail during the simultaneous absorption of these two sugars. However, Table I shows that the total amount of sugar absorbed is only 0.182 gm.

It is very striking that glucose is absorbed faster from the mixture than galactose, since the opposite is true if each of these two sugars is fed separately. In the case of the absorption of the mixture, if the rate of absorption of glucose is taken as 100, the ratio glucose to galactose is of the order 100:68.5. In the case of the separate absorption the ratio is of the order 100:110.

Summary.

When glucose and galactose are absorbed from a mixture of equal parts of these two sugars, the rate of absorption of both sugars is reduced to such an extent, that the total amount of sugar absorbed is not greater than if glucose alone or galactose alone were being absorbed.

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Toxin production of the streptococcus erysipelatis.

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The toxins employed in these studies were prepared in Douglas' tryptic medium inoculated with cultures of *Streptococcus erysipelatis*, which were isolated from the erysipelatous lesions of patients ill with erysipelas. Among thirty-four strains grown at