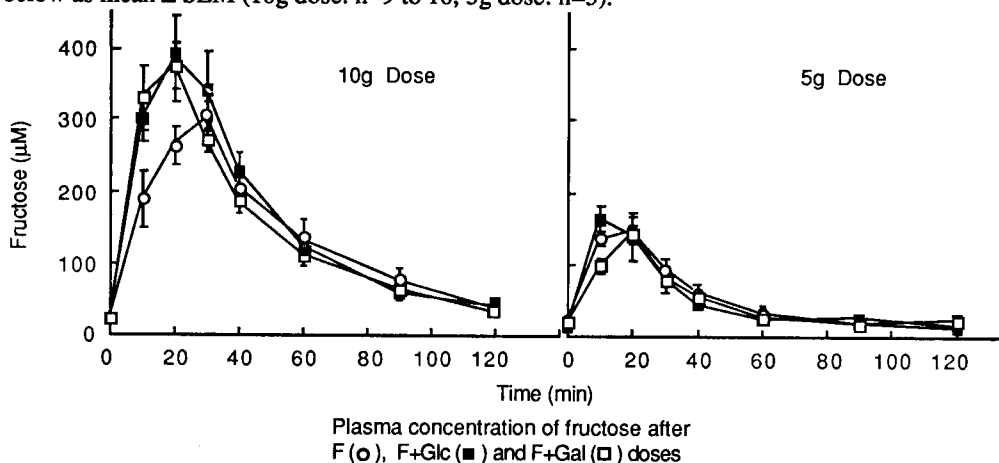


THE EFFECT OF GLUCOSE AND GALACTOSE ON THE INTESTINAL ABSORPTION OF PHYSIOLOGICAL DOSES OF FRUCTOSE IN MAN

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There is increasing commercial use of sweeteners which contain fructose. However, the ingestion of fructose in large amounts (25-50g) can cause gastrointestinal symptoms such as diarrhoea and cramps. It was concluded from studies using the breath hydrogen test that these symptoms were due to the incomplete intestinal absorption of fructose (Ravich et al. 1983). Although fructose is absorbed by a separate carrier to glucose and galactose, it was found that the efficiency of absorption in man increased with the addition of either glucose or galactose to the fructose dose (Kneepkens et al. 1984). We have used the plasma concentration of fructose to study the effect of combinations of lower and more physiological doses of these sugars on the absorption of fructose.

Adult males (5) and females (5) fasted for 8h prior to ingestion of a 5% carbohydrate solution. Each subject ingested 3 doses; 10g fructose (10gF); 10g fructose + 10g glucose (10gF+Glc); and 10g fructose + 10g galactose (10gF+Gal) on separate days. In addition, five male subjects were given 3 doses; 5g fructose (5gF); 5g fructose + 5g glucose (5gF+Glc); and 5g fructose + 5g galactose (5gF+Gal). Subjects exhibited no adverse symptoms to these doses. Finger-prick blood samples were collected at 0, 10, 20, 30, 40, 60, 90 and 120 min after ingestion of the dose. The plasma fructose concentrations were assayed luminometrically. Results are presented in the figure below as mean \pm SEM (10g dose: n=9 to 10; 5g dose: n=5).



There was no significant difference in the plasma fructose concentration between male and female subjects. The fructose concentration at 10 min for 10gF+Gal was significantly higher ($P < 0.05$) than for 10gF. There was no significant difference in fructose concentration between 10gF+Glc and either 10gF or 10gF+Gal at any time point. However, the fructose concentration for 5gF+Gal was found to be significantly lower at 10 min than for 5gF+Glc. There was no significant difference between the doses at any other time point.

Although there was some evidence of increased absorption due to the presence of galactose after the 10g dose, this was not supported by the results obtained either with the presence of glucose in the 10g dose or with the 5g doses. It is concluded that neither galactose nor glucose have a profound effect upon the efficiency of absorption of fructose at physiological intakes.

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