

Postprandial blood glucose and insulin responses to traditional breakfast preparations in healthy human subjects

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This study was undertaken to determine the postprandial glucose and insulin response of normal human subjects consuming the traditional breakfast preparations.

Eight normal subjects (aged 27-54 yr, fasting blood glucose range of 4.3-5.8 mmol/ L) consumed glucose as reference meal (RM) and seven test meals, namely, whole red rice (TM1); parboiled red rice (TM2); string hoppers made of red rice flour (TM3); Kurakkan+ rice flour (TM4) and corn bran + rice flour (TM5); mungbean (TM6) and *Kadala* (TM7) provided with coconut milk/sambal and tea. All test meals contained 50 g. available carbohydrates and were consumed at three-week intervals on separate occasions. Venous blood samples were collected after 12 hr. fasting (0 min) and then 30, 60, 90 and 120 min after meal ingestion. The glucose and insulin concentrations in the venous plasma were analyzed and compared with the responses to reference meal.

The results showed that the test meals TM6 and TM7 elicited significant reductions ($p < 0.0001$) in plasma glucose levels for area under the curve (AUC) values when compared with RM (AUC reductions 84 % and 63 % respectively). Significant reductions ($p < 0.002$) in plasma glucose levels for AUC values were also seen after the test meals TM1 and TM2, showing a AUC of 34 % and 50 % respectively when compared with RM. Both, TM 4 and TM5 showed increases in the plasma glucose concentrations as compared to TM3 and TM1. The Glycemic Index (GI) of the test meals were as follows: TM1= 53.1, TM2= 43.0, TM3 = 68.0, TM4= 77.9, TM5=78.9, TM6= 21.1 and TM7=43.9. A higher negative correlation ($r -0.755$, $p < 0.05$) was observed between the protein content of all seven-test meals and the GI values. The plasma insulin response to the test meals of TM 3, TM 4 and TM 5 (string hopper preparations) were observed higher than other meals.

The study concludes that legume based diets had the lowest GI values. Milled rice preparations (TM3, TM4 and TM5) had higher GI than whole rice meals. The parboiling process reduced the GI of rice. An increase in the protein content in the meal may favour low GI values in mixed meals.

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