An insulin index of common foods

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Insulin responses to foods may be relevant to the aetiology and treatment of NIDDM, IDDM, obesity and heart disease, yet are not currently considered when establishing the dietary and insulin regimens of diabetic patients. The aim of this study was to determine the relative insulinaemic effects of common foods.

Isoenergetic (1000 kJ) portions of 38 foods from six different food groups were fed to groups of 11-13 fasting subjects. Blood samples were obtained every 15 min over 120 min for the analysis of plasma glucose and insulin. An insulin index (II) score for each food was obtained by expressing the area under the 120 min insulin response curve (AUC) for the test food as a percentage of the mean 120 min AUC response to white bread. Thus, bread had an II score of 100%. A glycaemic score (not the same as the glycaemic index value which is based on a 50 g carbohydrate portion) for each food was also calculated in the same way using the plasma glucose AUC.

II scores differed significantly both within and between the food groups, with a six-fold difference between the highest (jellybeans: 147%) and lowest II (peanuts: 19%) scores. On average, snack foods and bakery products produced the highest II scores. White bread, an important Western staple, was consistently one of the most insulinogenic foods. Insulin responses to the protein-rich foods, snacks and bakery products were disproportionately high in relation to their glucose responses. Several foods with similar glycaemic responses produced disparate II scores. Stepwise multiple regression indicated that mean II scores were most strongly related to the glycaemic scores and sugar content of the foods (P<0.001) and were negatively related to the fat and water contents (P<0.001).
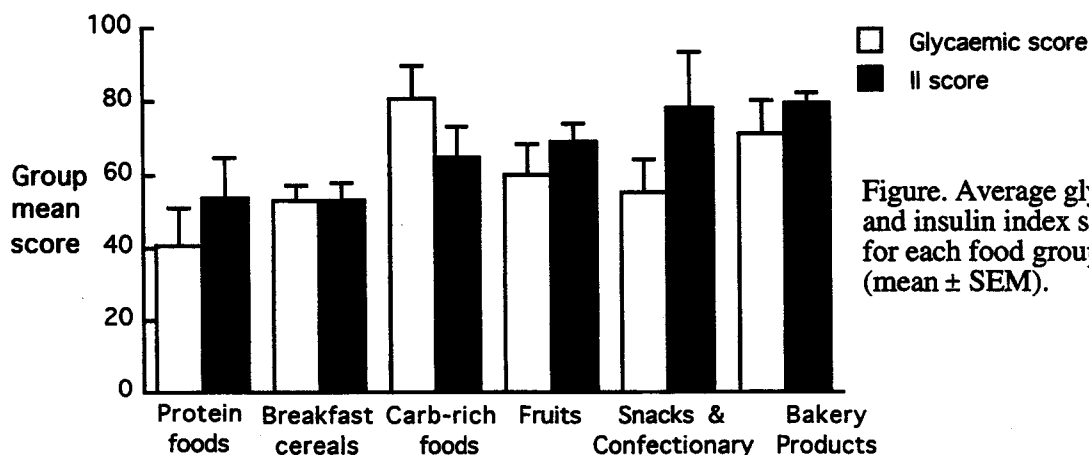

Figure. Average glycaemic and insulin index scores for each food group (mean ± SEM).

Food exchange lists governing diabetic diets assume that foods containing equal amounts of carbohydrate induce similar insulin responses. However, our results indicate that foods differ widely in their insulinogenic effects. Protein- and fat-rich foods should not necessarily be considered inert with respect to insulin therapy.