

Reduced Glycaemic Impact by Kiwifruit-Based Carbohydrate Exchanges Depends on Both Available Carbohydrate and Non-Digestible Fruit Residue

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Abstract : When a fruit such as kiwifruit is consumed its tissues are released from the physical /anatomical constraints existing in the fruit. During digestion they may expand several-fold to achieve a hydrated solids volume far greater than the original fruit, and occupy the available space in the gut, where they surround and interact with other food components. Within the cell wall dispersion, in vitro digestion of co-consumed carbohydrate, diffusion of digestion products, and mixing responsible for mass transfer of nutrients to the gut wall for absorption, were all retarded. All of the foregoing processes may be involved in the glycaemic response to carbohydrate foods consumed with kiwifruit, such as breakfast cereal. To examine their combined role in reducing the glycaemic response to wheat cereal consumed with kiwifruit we formulated diets containing equal amounts of breakfast cereal, with the addition of either kiwifruit, or sugars of the same composition and quantity as in kiwifruit. Therefore, the only difference between the diets was the presence of non-digestible fruit residues. The diet containing the entire dispersed kiwifruit significantly reduced the glycaemic response amplitude and the area under the 0-120 min incremental blood glucose response curve (IAUC), compared with the equicarbohydrate diet containing the added kiwifruit sugars. It also slightly but significantly increased the 120-180 min IAUC by preventing a postprandial overcompensation, indicating improved homeostatic blood glucose control. In a subsequent study in which we used kiwifruit in a carbohydrate exchange format, in which the kiwifruit carbohydrate partially replaced breakfast cereal in equal carbohydrate meals, the blood glucose was further reduced without a loss of satiety, and with a reduction in insulin demand. The results show that kiwifruit may be a valuable component in low glycaemic impact diets.

Keywords : carbohydrate, digestion, glycaemic response, kiwifruit

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