Abstract

Postprandial Metabolic Responses When Manipulating Timing and Composition of a Meal †

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Background: Controlling postprandial glycaemia helps to prevent and manage non-communicable diseases. One strategy in controlling glycaemia may be to consume meals in two parts; a preload, followed by the remainder of the meal. Our aim was to test preloading a rice meal given for breakfast and lunch on different days, either by splitting the meal (rice preload followed by rice meal) or by using kiwifruit as a preload compared with consuming the rice meal in one sitting.

Methods: Thirty healthy Chinese adults (25 female and 5 male, aged 19–41 years with a mean (SD) body mass index of 21.8 (3.8) kg/m²) took part in an unblinded, randomised, repeated measures cross-over design trial. Participants were allocated randomly to undertake breakfast or lunch testing first. The treatment order was then randomised separately for breakfast and lunch testing. Blood samples were collected at specific intervals to measure the primary outcomes of glycaemic and insulinaemic responses, and secondary outcomes of other hormonal responses. Subjective satiety and subsequent energy intake were also measured.

Results: Following breakfast, postprandial glycaemic peak concentration was 0.9 (95% CI: 0.2, 1.6) mmol/L lower for the kiwifruit preload compared with the rice meal eaten in one sitting. Following lunch, glycaemic peak concentrations were 1.0 (0.7, 1.4) and 1.1 (0.5, 1.7) mmol/L lower for the rice-split and kiwifruit preload compared with the rice meal alone, respectively. Postprandial insulinaemia area-under-the-curve was 1385 (87, 2684) mU/L·min less for the kiwifruit preload compared with the rice-split. Following breakfast and lunch, a greater appetite was reported after the kiwifruit compared with the rice preloads (p ≤ 0.005). There were no differences among treatments for subsequent energy intake.

Conclusions: Meal splitting is useful for lowering postprandial glycaemia. Replacing part of a meal with kiwifruit may help with insulin efficiency without detriment to subsequent energy intake.

Supplementary Material: The oral presentation is available online at www.mdpi.com/2504-3900/8/1/56/s1.

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