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Timing of fruit ingestion and blood glucose response

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Partial equal carbohydrate substitution of kiwifruit sugars for starch in foods co-ingested with whole kiwifruit (KF) leads to a substantial reduction in glycaemic response. The reduction in response appears to be due to both the exchange of fructose for glucose, and to the physical influence of undigested KF remnants on digestive processes in the foregut. As fructose consumption has been reported to promote blood glucose disposal, and KF remnants appear to retard processes that mediate absorption of starch-derived glucose from the foregut, it is possible that the ability of digestion-resistant remnants of kiwifruit to modulate the glycaemic response to starchy food depends on the temporal proximity of the ingestion of KF and starchy staple. To test this dependence of interaction on the closeness of intakes, KF (200 g = flesh of two KF) was ingested 10 h, 90 min, 30 min before, at the same time as, or 30 min after a starch-based wheaten biscuit (WB) containing the same amount of available carbohydrate, mainly starch, as the KF. Capillary blood glucose concentrations and satiety were measured after ingestion of the foods. Partial substitution of WB by KF caused a 20–30% reduction in total glycaemic response irrespective of the separation of KF and WB ingestion. However, ingesting KF 30 min before WB decapitated the blood glucose spike, whereas the reverse, WB ingested 30 min before KF, did not. The results suggest that both the temporal distribution of available carbohydrate (meal slowness) and differences in the composition of foods consumed at different stages in a meal may affect glycaemic response, perhaps by exerting different degrees of delay in the release of available carbohydrate from the stomach to small intestine during digestion.

Recent Publications

1. Mishra, S; Edwards, H; Hedderley, D; Podd, J; Monro J (2017). Kiwifruit non-sugar components reduce glycaemic response to co-ingested cereal in humans. *Nutrients*, 9, 1-13, DOI: 10.3390/nu9111195
2. Mishra, S; Willis, J; Ansell, J; Monro, JA (2016). Equicarbohydrate partial exchange of kiwifruit for wheaten cereal reduces postprandial glycaemia without decreasing satiety. *Journal of Nutritional Science*, 5, 1-9. DOI: 10.1017/jns.2016.30
3. Monro, J; Mishra, S; Redman, C; Somerfield, S; Ng, J (2016). Vegetable dietary fibres made with minimal processing improve health-related faecal parameters in a valid rat model. *Food & Function*, 7, 2645-2654, DOI: 10.1039/c5fo01526j.

Biography

Suman Mishra started her scientific career at the University of the South Pacific (Fiji), before moving to New Zealand where she completed her PhD studies. She currently works at the New Zealand Institute for Plant and Food Research where she leads Carbohydrate Digestion and Metabolism Team. Her initial research was on *in vitro* digestion of carbohydrate foods and now works in the glycaemic response area and human trials.

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