

## The effect of nutrient-extraction blender preparation of raspberries on Postprandial Glucose response in Adults.

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### Abstract

Increasing fruit consumption may reduce the risk of several chronic diseases. The nutrient extraction blender is a new method to consume fruit; however, health risks remain unclear. Nutrient-extraction blenders are designed to

homogenize the whole fruit without removing the fibre; conversely, old-style juicers squeeze the juice and remove the pulp. This study aimed to understand the effect of nutrient-extraction of raspberries on the glycaemic response

in healthy weight adults and overweight/obese, who are at risk of glucose intolerance. A total of 9 HW and 5 OW/OB adults were recruited to participate. Participants fasted for 12h overnight and then consumed raspberries with mango as whole fruit (WF), nutrient-extracted (NE) or a glucose control (C) (all 25g total sugar/ serving). Blood glucose levels were obtained via finger prick blood samples with a minimum 3-day washout period between test days. Glycaemic index was calculated from the incremental area under the 2-h glucose response curve for each meal. Multiple comparisons post-hoc (Turkey HSD) was conducted to determine the difference between meals. GI was significantly different between all conditions with mean  $\pm$ SD (C,  $100 \pm 37.07$ ), (WF,  $72.07 \pm 28.54$ ), (NE,  $43.31 \pm 23.57$ ), ( $p < 0.001$ ), but there were no differences between healthy weight and overweight / obese. The postprandial glucose response from NE raspberries was significantly lower than both WF and C. Whereas, other published findings demonstrated that the consumption of nutrient-extracted mango alone was not significantly different from the whole mango. These results show that homogenized raspberries could be a potential approach for glycaemic control.

Fruit consumption has beneficial health effects that correlate with the decreased risk of several chronic diseases. As a consequence, public health agencies consistently promote the protective health effects of fruit. However, fruit juice is known to cause a postprandial peak in blood glucose, and it is advised to limit juice intake due to this high glycaemic index (GI).

Consistent with the effect on GI, research from large cohort studies has shown an association between fruit juice consumption and an increased risk of type 2 diabetes (T2DM). It has been suggested that the decrease in fibre per serving of fruit juice compared with whole fruit may explain the increased risk of T2DM. Recommendations to increase fruit intake have increased the popularity of 'nutrient-extraction' blenders that homogenize whole fruit to create 'smoothies' without the removal of fibre. This form of processing is in contrast to traditional juicers that eliminate pulp, with most of the current GI-focused literature being based upon studies using fruit juice devoid of pulp. The impact on health of the consumption of fruit that has been nutrient-extracted, rather than juiced in a traditional manner, therefore remains unclear, and requires investigation for public health guidance. It is particularly important to understand the effect on the glycaemic response in individuals susceptible to glucose intolerance, such as those with obesity, as this population is more susceptible to T2DM onset. These disease-susceptible individuals also make up an ever-increasing proportion of the population in high income countries, such as the UK (63%).

Findings from an earlier study in young, healthy adults demonstrated that the consumption of mixed fruit following nutrient extraction resulted in a significant lowering of the GI, compared with the non-extracted (whole) fruit. In contrast to the fruit mixture, the nutrient extraction of mango as a single fruit had no effect on the GI. These findings suggested, that in contrast to conventionally prepared fruit juice, fruit juice prepared by nutrient extraction in some cases elicits a more favourable postprandial glycaemic response than whole fruit.

## **Biography**

Rabab Alkutbe is a researcher working with Dr Gail Rees at the University of Plymouth. Rabab received her bachelor degree in Nutrition food sciences in Saudi Arabia and then matriculated at Flinders University in Australia where she conducted her Masters study in public health in 2010.

Rabab's graduate work focused on nutrition stream, food policy and determinants of health and wellbeing. She was awarded her PhD in 2017 from University of Plymouth, her thesis investigated obesity and its causes in children. Currently, she examines the effect of nutrient extraction on postprandial glucose when consume different fruits in obese adults.

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