

Effect of different cooking methods on glycaemic index of Indian and Pakistani basmati rice varieties

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Abstract

Introduction Glycaemic index (GI) reflects the blood glucose response after ingestion of a 50g digestible carbohydrate portion. Many factors affect the GI, including degree of starch gelatinization.

Methods The objective was to determine the GI and the effect of different cooking methods on GI of a Pakistani basmati rice (PBR) and an Indian basmati rice (IBR) frequently purchased by Sri Lankans. This was a cross-over study. Participants were ten healthy individuals aged 20-30 years whose BMI range was 18.5-23.5 kgm⁻². Proximate composition, [carbohydrate, protein, fat, soluble dietary fibre (SDF), insoluble dietary fibre (IDF) and ash], amylose content and GI of the two rice varieties were determined by using standard methods. Rice was cooked separately in a rice cooker and a microwave by adding 1 cup of rice (110 g) and 1 cup of water (150 ml)). Glucose was used as the standard. GI values were expressed as the average value of 10 participants.

Results Fat, total dietary fibre (TDF), SDF and IDF contents were significantly ($p < 0.05$) higher in IBR when compared to PBR. The GI values of IBR and PBR cooked in a rice cooker (GI=54 SD=8; GI=64 SD=12) or microwave (GI=43 SD=28; GI=56 SD=12) belonged to low and medium GI categories respectively. A percentage reduction in GI values was seen in PBR (12.5%) and IBR (20.4%) when cooked in a microwave oven compared to a rice cooker.

Conclusions Irrespective of the method of cooking PBR had medium GI and IBR had low GI.

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processing and other food components). Thus, foods are categorised into low (55 or less), medium (56-69) and high (70 or above) GI foods [1].

The prevalence of obesity and type 2 diabetes is rapidly increasing in both the developed and developing countries. The prevalence of diabetes in Sri Lankan adults was 10.3% in 2005 and increased to 18.6% by 2011 [3]. The prevalence of obesity in Sri Lankan adults was 9.2% in 2010 [4]. Consumption of more refined, fast release, staple carbohydrate foods is cited as one of the major reasons for the development of obesity and other non-communicable diseases [5]. Thus, selection of foods and dietary modifications are important to prevent or control these conditions.

Rice is the staple food in Sri Lanka contributing to glycaemic carbohydrates and thus to the glycaemic response. Basmati is a rice variety used by Sri Lankans. Though rice is our staple food, data related to GI of some commonly consumed imported basmati varieties are not available. Thus, the present study was conducted to determine the GI and effect of two commonly used cooking methods on GI of two imported basmati varieties available in Sri Lanka.

Methods

An unstructured interview type market survey was carried out to collect information regarding the consumer purchasing trends and preferences. Following the survey, two basmati rice varieties Indian basmati rice (IBR) and Pakistan basmati rice (PBR) were selected. Rice adequate for the whole GI study (7 kg) was purchased from a retail shop at Battaramulla, Sri Lanka at the beginning of the study.