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## Determination of Glycaemic Responses in Sugar Incorporated with Selected Natural Plant Extracts

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### Abstract

The glycaemic index (GI) is a measure of the food's power to raise blood glucose ( $\beta$ -glucose) concentration after a meal. Low-GI carbohydrates lower the risk of adverse health outcomes, including type II diabetes mellitus and cardiovascular disease by causing a lower and slower rise in blood glucose and insulin levels. The main objective of this prospective study was to determine glycaemic indices of cane sugar that is incorporated with Fenugreek (*Trigonella foenum-graecum*), Turmeric (*Curcuma longa*), Black pepper (*Piper nigrum*), Ginger (*Zingiber officinale*), Cinnamon (*Cinnamomum verum*), Gooseberry (*Phyllanthus emblica*) and Pomegranate (*Punica granatum*) extracts of equal ratios; in aim to suppress glycaemic impact. The GI value for sugar incorporated with selected plant food extracts was determined using standardized methodology in 12 healthy volunteers. Volunteers randomly underwent 2 sets of food challenges involving glucose (reference) and sugar incorporated with selected plant food extracts (test food), both providing 50 g available carbohydrates. Serum glucose was monitored at various time-points i.e., at 0 (fasting), 15, 30, 45, 60, 90 and 120 minutes after ingestion and GI values were calculated by dividing the incremental area under the curve (IAUC) for the tested food by that for the standard food (IAUCS). Biochemical variables were measured using enzymatic colorimetric method (GOD/POD/PAP). MS Excel and the statistical program Minitab 17 were used to analyze the data. The mean GI value (95% CI) for sugar was  $49 \pm 8$ . GI values was not significantly related to subject characteristics such as sex and age. The results of the study indicated that sugar product incorporated with selected plant food extracts; has a significantly ( $p < 0.05$ ) lower GI than normal cane sugar (GI=65). This trial is registered with the Ethics Review Committee, Faculty of Medical Sciences, University of Sri Jayewardenepura as 21/18.

**Keywords:** Glycaemic index, Diabetes mellitus, Turmeric, Gooseberry, Fenugreek