

## Extended Prandial Glycemic Profiles of Foods as Assessed Using Continuous Glucose Monitoring Enhance the Power of the 120-Minute Glycemic Index

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### Abstract

#### Background:

The glycemic index (GI) is routinely measured 120 minutes after food intake (GI120). The purpose of this prospective open label study was to assess (1) the dynamics of glycemia over the 210 minutes following food consumption and (2) the evolution of GIs based on 120-, 150-, 180-, and 210-minute glycemic profiles.

#### Method:

Twenty healthy subjects (mean  $\pm$  SE;  $21.9 \pm 1.39$  years of age; body mass index  $23.6 \pm 0.63$  kg/m<sup>2</sup>; 7 men and 13 women) completed the study. Each subject consumed 10 different foods with known GI120 on three separate occasions at four different times of day according to a defined meal plan over a 9-day period; 32 meals were evaluated. The GIs for intervals of 120, 150, 180 and 210 minutes after food consumption were determined using a continuous glucose monitoring system (CGMS) to measure glycemia. The Wilcoxon signed-rank test was applied to compare the GIs.

#### Results:

Glycemia returned to baseline within 120 minutes for honey and tomato soup; within 210 minutes for white bread, choco-rice cookies, fish and potatoes, wafers, and meat ravioli with cheese; and later for dark chocolate, apricot dumplings, and choco-wheat cookies. The extended GIs were higher than the respective GI120s in eight of the foods.

#### Conclusions:

The 120-minute glycemic index fails to fully account for changes in glycemia after ingestion of a mixed meal because glycemia remains above baseline for a longer period. The CGMS is a convenient method to determine the glucose response/GIs over intervals extended up to 210 minutes, which is adequate time for the absorption of most foods.

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**Abbreviations:** (ANOVA) analysis of variance, (BMI) body mass index, (CGMS) continuous glucose monitoring system, (GI) glycemic index, (GI120) glycemic index at 120 minutes

**Keywords:** continuous glucose monitoring, data processing software, extended glycemic index, mixed meal

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