USANA HEALTH SCIENCES

CLINICAL RESEARCH BULLETIN

Glycemic Index Score of the USANA Peanut Butter Nutrition Bar

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Glycemic index (GI) was developed to rank different foods according to the extent to which they increase blood glucose following ingestion.[1] Foods with high GI scores contain rapidly digested carbohydrates and produce large rises and falls in blood glucose. Foods with low GI scores contain slowly digested carbohydrates and produce gradual and relatively low rises in blood glucose.

GI scores are currently used in scientific research to examine the role of glycemic impact in defining risk of certain diseases. For example, a growing body of research has shown that long-term consumption of a high-glycemic-impact diet increases the risk of developing diabetes, heart disease, and colon cancer.[2,3] GI scores are also useful in designing weight- and eating-management programs. Low-GI foods improve glucose control in people with diabetes[2] and reduce high blood fat levels.[4] Furthermore, less refined low-GI foods are relatively more filling and therefore useful for weight loss.[5,6] The objective of this study was to evaluate the GI score for USANA's Peanut Butter Nutrition Bar.

Methods

This study was conducted using internationally recognized GI methodology.

Ten healthy subjects were recruited, and each completed three test sessions—two involving the reference food (glucose solution), and one involving the test food (Nutrition Bar). At each session, subjects reported in the morning to the research center in a fasting state (10–12 hours overnight). Subjects completed a baseline fullness rating and provided a fasting blood sample. The subjects then consumed a fixed amount of a test food (Nutrition Bar) or reference food (glucose), supplying 50 grams of available carbohydrate. (Nutritional characteristics for the servings of reference and test foods are given in Table 1.) Subjects were then required to remain seated and to refrain from additional eating and drinking for the next two hours. Additional blood samples were taken 15, 30, 45, 60, 90, and 120 minutes after the test meal. Additional fullness ratings were completed after each

Table 1

Characteristics of the Test Foods

	Energy (kJ)	Protein (g)	Fat (g)	Carb. (g)
Glucose Reference	800	0.0	0.0	50.0
USANA Peanut Butter Nutrition Bar	1658	31.6	10.5	52.6

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blood sample.

All blood samples were analyzed in duplicate for glucose levels using the glucose hexokinase enzymatic method. Results were used to plot two-hour blood glucose response curves, and the area under the curve (AUC) for each plot was calculated. (AUCs indicate the magnitude of total blood glucose response.) The GI score for the test food was calculated by dividing its two-hour blood glucose AUC value by the subjects' average two-hour blood glucose AUC value for the reference food, then multiplying by 100 to obtain a percentage score. Fullness responses were quantified in similar fashion. The seven fullness ratings collected for each subject and test food were plotted as a function of time to construct a two-hour fullness response curve. The AUC for this curve was calculated, then divided by the energy content of the test food to determine the total fullness produced by the test food per kilojoule (kJ).

Results

Figure 1 shows the average changes (10 subjects) in blood glucose after consumption of the reference and test food.

The USANA Peanut Butter Nutrition Bar produced lower blood glucose levels than did the glucose reference meal during the first 60 minutes following ingestion. Average plasma glucose levels following consumption of the USANA bar fell below the fasting level at 60 minutes, but subsequently increased. At 120 minutes, the average plasma glucose level was greater than the average for the glucose reference meal. Average GI scores for the test and reference foods are given in Figure 2.

The Peanut Crunch Bar gave a GI score of 30 ± 4% (relative to the standard 100% GI score for glucose). Analysis of the fullness response data showed that the USANA Nutrition Bar provided more than twice the two-hour fullness values given by the glucose test meal (results not shown). However, when expressed as the total amount of fullness produced per kJ of food consumed, no significant differences existed between test and reference food.

Discussion

The Glycemic Index scale is continuous from 0–100%. In general, a food is considered high-glycemic if its GI score is greater than 70, moderately glycemic if its GI score is between 56 and 69, and low-glycemic if its GI score is less than 55.[7] Results from this study clearly show that USANA's Peanut Butter Nutrition Bar is a low-glycemic food. As such, it may help people reduce the risks of the detrimental health effects associated with long-term consumption of high-GI diets. It should also be suitable for consumption, in controlled amounts, by people with diabetes, taking into account individual requirements for reduced energy and fat intakes.

The USANA Peanut Butter Nutrition Bar resulted in a higher two-hour fullness score than did the glucose reference food. This was expected, because the bar provided more energy than did the glucose and because its solid form would stimulate several satiety mechanisms. Nevertheless,

Figure 1
Two-hour blood glucose response curves for the test food (USANA Nutrition Bar) and reference food (glucose solution). Values are averages for 10 subjects.

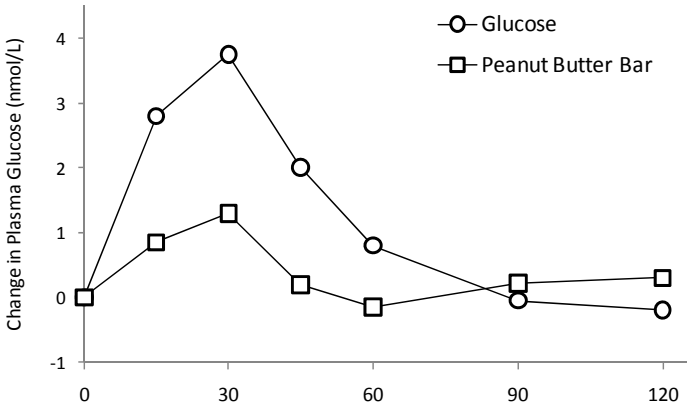

Figure 2
Average GI scores for the USANA Peanut Butter Bar and the glucose reference food

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the standardized fullness scores for the Nutrition Bar was higher than for many candy bars and cookies, indicating that it may be a better option than many snack foods for people who are actively trying to control their weight and blood sugar levels.

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