CLINICAL RESEARCH BULLETIN

Glycemic Index Score of the USANA Fibergy Bar and Chocolate Nutrimeal

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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 determine GI scores for USANA's Fibergy Bar and Chocolate Nutrimeal products.

Methods

This study was conducted using internationally recognized GI methodology.

Ten healthy subjects were recruited, and each completed four test sessions: two involving the reference food (glucose solution), and two involving the test foods (USANA Fibergy Bar and Chocolate Nutrimeal). 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 or reference food. For the Chocolate Nutrimeal, the test and reference foods each supplied 25 grams of available carbohydrate. For the Fibergy Bar, the test and reference foods each supplied 50

Table 1

Characteristics of the Test Foods

	Energy (kJ)	Protein (g)	Fat (g)	Carb. (g)
Glucose Reference I*	800	0.0	0.0	50.0
USANA Fibergy Bar	1350	5.4	2.1	66.1
Glucose Reference II*	400	0.0	0.0	25.0
USANA Chocolate Nutrimeal	1174	22.4	6.9	37.3

* Glucose Reference Meals I and II were used with the USANA Fibergy Bar and Chocolate Nutrimeal, respectively.

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grams of available carbohydrate. (Nutritional characteristics for the servings of reference and test foods are given in Table 1.)

After consumption of the test or reference food, subjects were 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 meal. Additional fullness ratings were completed after each 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 per kilojoule (kJ).

Results

Figures 1 and 2 show the average (10 subjects) two-hour blood glucose response curves following consumption of the reference and test foods.

The Fibergy Bar—which is a high-carbohydrate fiber supplement and not a balanced food—yielded a glucose response curve similar in shape to the reference food but significantly lower in amplitude (Figure 1). Chocolate Nutrimeal – which is a balanced 50:30:20 food – produced significantly lower blood glucose levels than did the glucose reference meal during the first 60 minutes following ingestion. During the second 60 minutes, plasma glucose remained at moderate levels for Chocolate Nutrimeal but fell well below baseline fasting levels for the glucose reference meal (Figure 2).

AUC analysis, based on the above glucose response curves, yielded Glycemic Index scores for the test and reference foods. The Fibergy Bar gave a GI score of 45±4%, and the Chocolate Nutrimeal gave a GI score of 26±3% (relative to the standard glucose GI score of 100%).

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 Fibergy Bar and Chocolate Nu-

trimeal are low-glycemic foods. As such, they may help people reduce the risks of the detrimental health effects associated with long-term consumption of high-GI diets. They should also be suitable for consumption, in controlled amounts, by people with diabetes, taking into account individual requirements for reduced energy and fat intakes.

References

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Figure 1
Two-hour blood glucose response curves for USANA's Fibergy Bar and a glucose reference meal. Values are averages for ten (10) subjects.
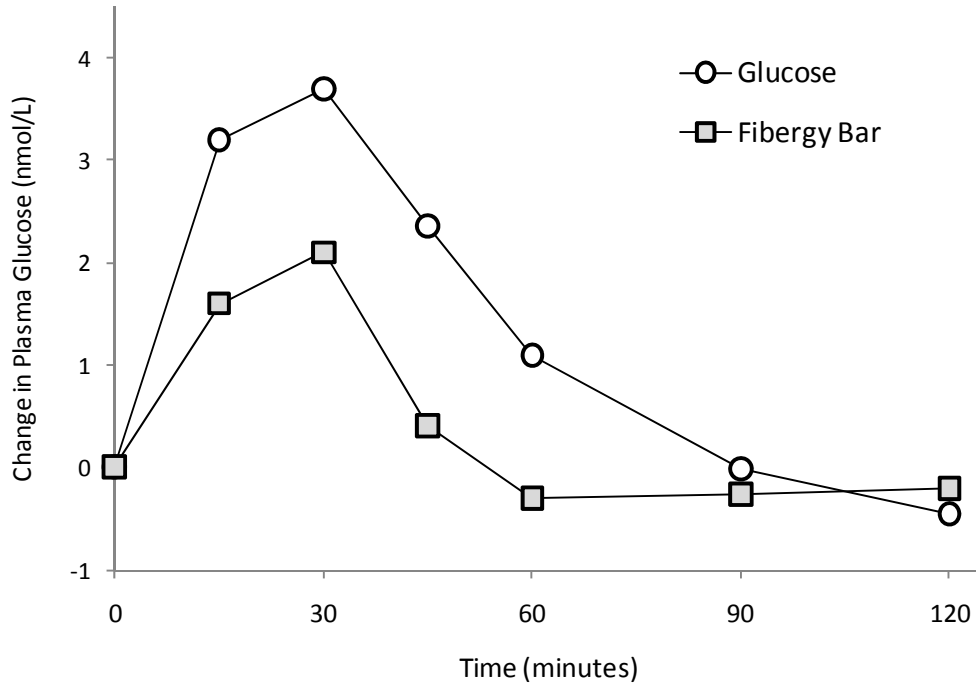

Figure 2
Two-hour blood glucose response curves for USANA's Chocolate Nutrimeal and a glucose reference meal. Values are averages for ten (10) subjects.

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