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### Glycemic Index (GI) Score for USANA's Fibergy Bar and Chocolate Nutrimeal

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#### Introduction

The glycemic index (GI) was developed to rank various foods according to the extent to which they increase blood glucose following ingestion (1). Foods with a high GI score contain rapidly digested carbohydrates and produce a large rise and fall in blood glucose. Foods with a low GI score contain slowly digested carbohydrates and produce a gradual and relatively low rise in blood glucose. GI scores are currently used in scientific research to examine the role of glycemic impact in defining the 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 and reduce high blood fat levels (2, 4). In addition, less refined low-GI foods are relatively more filling and are useful for weight loss (5, 6). The objective of this study was to evaluate the GI scores for USANA's Fibergy Bar and Chocolate Nutrimeal.

#### Methods

Ten healthy subjects were recruited for the study, which was conducted using internationally recognized GI methodology. Each subject completed four test sessions: two involving the reference food (glucose solution) and two involving the test foods (USANA's 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. Subjects then consumed a fixed amount of a test food or reference food. In the case of Nutrimeal, the test and reference foods each supplied 25 g of available carbohydrate. In the case of Fibergy Bar, the test and reference foods each supplied 50 g 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 meals. 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 the total blood glucose response.) The GI scores for the test foods were calculated by dividing the appropriate two-hour blood glucose AUC value by the subjects' average two-hour blood glucose AUC value for the reference food and then multiplying by 100 to obtain a percentage score.

**Table 1.**

Characteristics of the test foods.

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

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

#### 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  $45 \pm 4\%$ , and the Chocolate Nutrimeal gave a GI score of  $26 \pm 3\%$  (relative to the standard GI score for glucose of 100%).

## Discussion

The Glycemic Index scale (0–100%) is continuous. But in general, a food is considered high-glycemic if its GI score is greater than 70, moderately glycemic if its GI score is between 55 and 70, and low-glycemic if its GI score is less than 55 (7). Results from the study reported here clearly show that USANA's Fibergy Bar is a low-glycemic food and that Chocolate Nutrimeal is an exceptionally low-glycemic food. As such, they should help people to reduce their risks of the detrimental health effects associated with long-term consumption of high-GI diets. They may provide better options than many snack foods for people who are trying to control their weight and blood sugar levels. And, 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.

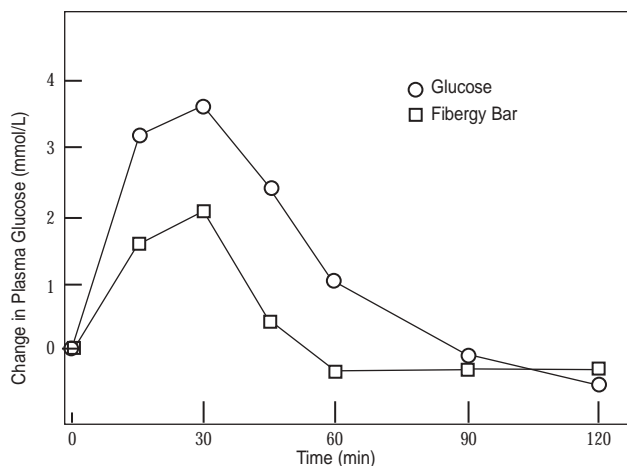
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## References

- (1) Jenkins DJA et al. 1981. Glycemic index of foods: a physiological basis for carbohydrate exchange. *Am J Clin Nutr* 34: 362.
- (2) Joint FAO/WHO Report. 1998. Carbohydrates in Human Nutrition. FAO Food and Nutrition, Paper 66. FAO, Rome.
- (3) Favero A, et al. 1999. Energy sources and risk of cancer of the breast and colon-rectum in Italy. *Adv Exp Med Biol* 472:51.
- (4) Brand-Miller JC. 1994. The importance of glycemic index in diabetes. *Am J Clin Nutr* 59: 747S.
- (5) Slabber M, et al. 1994. Effects of low-insulin-response, energy-restricted diet on weight loss and plasma insulin concentrations in hyperinsulinemic obese females. *Am J Clin Nutr* 54: 846.
- (6) Holt S, et al. 1995. A satiety index of common foods. *Eur J Clin Nutr* 49: 675.
- (7) Brand-Miller JC, et al. 1998. *The G.I. Factor*. Hodder Headline, Sydney NSW. 252 pp.

**Figure 1.**

Two-hour blood glucose response curves for USANA's Fibergy Bar and its associated reference meal. Values are averages for the 10 subjects.



**Figure 2.**

Two-hour blood glucose response curves for USANA's Dutch Chocolate Nutrimeal and a glucose reference meal. Values are averages for 10 subjects.

