



# HerbClip™

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**File: ■ Fenugreek (*Trigonella foenum-graecum*)**

■ **Blood Glucose**

■ **Satiety**

**HC 120692-400**

**Date: May 14, 2010**

**RE: Effects of Fenugreek Fiber on Postprandial Satiety, Blood Glucose, and Insulin Response in Obese Subjects**

Mathern JR, Raatz SK, Thomas W, Slavin JL. Effect of fenugreek fiber on satiety, blood glucose and insulin response and energy intake in obese subjects. *Phytother Res*. Nov 2009;23(11):1543-1548.

Fenugreek (*Trigonella foenum-graecum*) seeds are used in traditional medicine to stimulate the appetite and treat digestive disorders. While traditional use of fenugreek has been as an appetite stimulant, it has also become a novel source of soluble dietary fiber which has indications for effects on satiety. Fenugreek seeds contain lipids, steroidal saponins, protein, and dietary fiber, primarily the water-soluble fiber galactomannan. Initial clinical and pre-clinical trials have demonstrated that fenugreek exerts hypolipidemic and hypoglycemic effects.<sup>1</sup> The purpose of this clinical trial was "to examine the effects of an isolated fiber from fenugreek on postprandial satiety."

The researchers recruited non-smoking obese (Body Mass Index [BMI]≥30) men and women aged 18-65 years through advertisements posted in the University of Minnesota community in Minneapolis, Minnesota. The subjects (n=18) were required to eat breakfast daily and to have blood glucose levels below 6.99 mmol/L. The randomized crossover study was conducted at the General Research Center of the University of Minnesota. During 3 randomized sessions, the subjects consumed a test breakfast and either 0 g, 4 g, or 8 g of fenugreek extract (FenuLife®; Frutarom, Inc.; North Bergen, New Jersey). The powdered fenugreek fiber extract was mixed with a low-calorie beverage and ice in a blender. The fenugreek extract contained 90% total fiber and 78.9% soluble fiber (galactomannan), therefore 4g of the fenugreek extract provided 3.6 g total fiber and 8 g provided 7.2 g total fiber. The study sessions were conducted at least 48 hours apart following 10-hour fasts in which the subjects consumed only water.

During the study, the subjects followed their normal exercise routines and did not take fiber or weight loss supplements. The subjects received instructions from a Registered Dietician on how to record their hunger, fullness, satiety, and prospective food consumption on Visual Analogue Scales (VASs). The VASs were 100 mm in length, and scores were converted into numbers from 0 (none) to 100 (worst). After drinking the test beverage, the subjects ate a standardized test breakfast. Blood was collected through an indwelling catheter to measure glucose and insulin levels at 15, 30, 45, 60, 90, 120, 150, and 180 minutes after the start of the breakfast. After 3.5 hours, the subjects were allowed to eat as much as they wanted from

a lunch buffet, and they recorded food consumption for the rest of the day in food diaries. The food left on the buffet was weighed and recorded.

There were no withdrawals from the study. The area under the curve (AUC) for satiety was significantly higher for the 8 g fenugreek extract, when compared to the control (0 g fenugreek extract) and the 4 g doses ( $P=0.002$  and  $P=0.008$ , respectively). Peak satiety was significantly greater for the 8 g fenugreek extract compared to the 4 g extract and the control ( $P<0.0001$  and  $P=0.0004$ , respectively). The satiety AUC and peak satiety were not significantly different between the control and the 4 g fenugreek extract. The hunger AUC was significantly lower for the 8 g fenugreek extract compared to the control and the 4 g fenugreek extract doses ( $P=0.031$  and  $P=0.010$ , respectively). Peak hunger was significantly lower for the 8 g fenugreek extract compared to the 4 g extract ( $P=0.0035$ ), but not the control dose. The fullness AUC was significantly higher after the 8 g fenugreek extract compared to the control and 4 g doses ( $P=0.041$  and  $P=0.005$ , respectively). Peak fullness was higher for the 8 g fenugreek extract compared to the control and 4 g doses ( $P=0.006$  and  $P<0.001$ , respectively). Peak fullness was not significantly different between the control and 4 g fenugreek extract doses.

The AUC for prospective food consumption was significantly lower for the 8 g fenugreek extract compared to the control and the 4 g extract ( $P=0.009$  and  $P=0.019$ , respectively). The peak ratings of prospective food consumption were also significantly lower for the 8 g fenugreek extract compared to the control and the 4 g extract ( $P=0.009$  and  $P=0.019$ , respectively). The subjects rated the palatability of the 8 g fenugreek extract significantly lower than the control and the 4 g extract ( $P<0.0001$  and  $P=0.035$ , respectively). The subjects rated the 4 g fenugreek extract as significantly less palatable than the control ( $P=0.022$ ). The subjects also gave the 8 g fenugreek extract lower ratings for taste, smell, aftertaste, and visual appearance. The subjects' energy intake was significantly lower following the 8 g extract compared to the 4 g extract ( $P=0.01$ ), but not the control (there was a trend towards significance). The researchers did not observe any other significant differences in energy intake. The AUC for postprandial insulin and peak insulin were significantly higher after the 8 g fenugreek extract compared to the control ( $P=0.07$  and  $P=0.01$ , respectively). Peak insulin was significantly lower after the 4 g fenugreek extract compared to the 8 g extract ( $P<0.01$ ). There were no other significant differences in blood parameters.

The researchers conclude that an 8 g dose of fenugreek fiber increases satiety and the postprandial insulin response. The mechanism of action for the observed increase in satiety may be related to delayed gastric emptying. The effect on postprandial insulin differs from other studies on fenugreek fiber and the authors recommend further research. The authors write that a larger meal may be needed to see an effect on blood glucose, as observed in other studies. They conclude, "The effects on appetite suppression and food intake suggest that fenugreek fiber may have a role in the control of food intake in obese individuals."

—Marissa Oppel-Sutter, MS

#### Reference

1. Milot B. Common therapeutic use of fenugreek. *HerbClip*. September 30, 2003 (No. 050131-241). Austin, TX: American Botanical Council. Review of Therapeutic applications of fenugreek by Basch E, Ulbricht C, Kuo G, Szapary P, Smith M. *Altern Med Rev*. 2003;8(1):20-27.

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