



## Twenty-Two Year Follow-up Shows: Higher the Plant Sterol, Lower the Cholesterol, and Longer the Life

Higher levels of plant constituents known as phytosterols, measured twenty-two years ago in then middle-aged men with a high risk of cardiovascular disease, has been shown to predict lower long-term mortality. Though the merits of phytosterols have been well established for quite some time, a study with this duration of a follow-up is certainly worth reviewing.

The study mentioned above, which was released from Finland and recently published in the professional journal *Atherosclerosis*, chose to evaluate the predictability of serum levels of non-cholesterol sterols among men with a high cardiovascular disease risk. There were half a dozen non-cholesterol sterols measured including plant sterols such as campesterol and sitosterol as well as others related to cholesterol synthesis and absorption. None of the 232 participants in the study were on any form of cholesterol-lowering drug therapy (statin) when initial data was collected in 1985-1986; however, most had elevated cholesterol and some furthermore had a history of cardiovascular disease, cancer, or diabetes.

The only noteworthy statistically significant result was that sitosterol was found to have been higher in the survivors than non-survivors at the time of their initial samples. Specifically, in multi-variable analyses, the highest sitosterol-to-cholesterol tertile was associated with a significantly lower mortality risk than the lowest tertile in the study. Almost half of the men did not survive to the twenty-two year follow-up; they were largely noted to have smoked more, exercised less, and had more characteristics of metabolic syndrome, such as elevated blood pressure, low HDL, and an increased waist-to-hip ratio.

Phytosterols have been widely researched for their ability to decrease cholesterol absorption in humans. The United States Food and Drug Administration (FDA) has even made permissible a statement to this effect: "foods containing at least 0.4 grams per serving of plant sterols eaten twice a day with meals for a daily total intake of at least 0.8 grams, as part of a diet low in saturated fat and cholesterol, may reduce the risk of heart disease". Their mechanism of action would seem to be inhibition of cholesterol absorption by displacing cholesterol from the means transport out of the digestive tract, a feat made possible because the two molecules are structurally very similar.

While statins have been effective in reducing the risk of heart disease, there are individuals who are unwilling or unable to utilize such cholesterol-lowering medications. Inability to tolerate statins may be due to either of the rather widely publicized statin-induced complications, such as muscle pains or elevated levels of liver enzymes. Fortunately, the ample evidence linking dietary interventions to successful risk reduction has prompted various regulatory bodies to advocate dietary and lifestyle changes as the first line of defense for primary prevention of heart disease and cardiovascular well-being. Nutritional supplement manufacturers have accordingly released products using phytosterols and some have even clinically demonstrated their ability to achieve therapeutic results in conjunction with other lifestyle changes. Thus people seeking to manage elevated cholesterol have several different alternatives to explore.

## Lower cholesterol and spontaneously eat less with an herb? It's Greek to me!

A recent study published in the *European Journal of Clinical Pharmacology* found ingestion of fenugreek seeds, scientifically known as *Trigonella foenum-graecum*, reduced spontaneous consumption of fats. Fenugreek has long been used for lowering elevated cholesterol and blood sugar levels, with efficacy determined by preliminary and double-blind trials. This finding further identifies fenugreek as a strategic component of treatment plans aimed at cardiovascular and glycemic disorders.

The purpose of this study was to assess the effects of repeated supplementation with fenugreek seed extract on the appetite and food choices, or "energy intake and eating behavior", of human beings. The researchers noted how animal studies had demonstrated fenugreek's ability to moderate feeding behavior in other species, but that there was limited data showing how this may relate to people. Thus they recruited twelve healthy males and commenced a double-blind, randomized, placebo-controlled, three-period, cross-over trial comparing two different doses of fenugreek seed extract, 588mg and 1,176mg. Each of the three treatment periods lasted two weeks and was separated by a two week "washout" period without fenugreek supplementation. Data collected for the study included a three day dietary record, weight measurement, glucose and insulin levels both before and after breakfast, lipid profile, and visual analogue scale scores of appetite/satiety.

Subjects taking the higher dose of fenugreek seed extract showed a significant reduction in daily fat consumption when compared to the placebo group. This typically reduced the total amount of food consumed that day, or "total energy intake" among participants. Therefore, the authors of the above study concluded that repeated doses of *Trigonella* "specifically decreases dietary fat consumption in humans".


Fenugreek's numerous benefits are a result of its biochemistry. Its steroidal saponins (diosgenin, yamogenin, tigogenin, and neotigogenin) and mucilaginous fiber are thought to account for many of the positive effects, though the mucilages also

interfere with iron absorption. Specifically, the fiber-rich gum is thought to inhibit cholesterol synthesis in the liver and help lower blood sugar levels whereas the saponins are believed to increase fecal bile and cholesterol excretion through a bile acid-saponin formation of cholesterol carriers, or micelles, too large to be absorbed by the digestive tract.

Human studies have found that fenugreek can help lower cholesterol and blood sugar levels in people with moderate atherosclerosis and non-insulin-dependent (type 2) diabetes, while other studies have additionally shown a decrease in triglyceride levels among similar patients. A recent Canadian study has even reported dietary use of fenugreek seeds can diminish pre-established cholesterol gallstones.

You might be concerned that HDL, the desirable cholesterol, is decreased by fenugreek as well. Fortunately, fenugreek has repeatedly been shown to have slight, or even insignificant, reduction of HDL. So it would seem the good news with fenugreek keeps on coming, while your undesirable cholesterol and appetite keeps dropping.

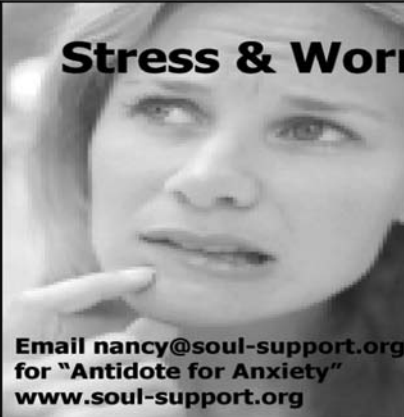
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