



## New USDA Study Shows Plant Sterols Lower Cholesterol

By Jim De Quattro  
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**WASHINGTON, Apr. 18**--People who already eat a low-fat diet to reduce cholesterol might lower it more by consuming a soybean extract with high levels of substances called plant sterols, according to preliminary new research, Agricultural Research Service Administrator Floyd P. Horn said today. Volunteers in the research study ate the soybean sterols as an ingredient in low- and reduced-fat salad dressings.

"The research is preliminary but offers new evidence that soybean and other plant extracts containing sterols can increase the cholesterol-lowering benefits of a healthy low-fat diet," said Horn. "People who want to reduce their cholesterol through diet may see better results by including low-fat foods having added sterols as part of their low-fat diet."

The study's lead researcher, chemist Joseph T. Judd of USDA's Agricultural Research Service in Beltsville, Md., presented the findings today at the Experimental Biology 2000 meeting in San Diego.

Horn said cholesterol reductions nearly doubled in the study's 53 men and women volunteers, when their low-fat diet included two daily servings (4 tablespoons total) of salad dressing containing soybean sterols. The volunteers consumed the sterols--2.2 grams or about ½ teaspoon--daily for three weeks of the six-week study period in 1999.

Judd led the study at ARS' Beltsville Human Nutrition Research Center. The study was partly funded by Lipton through a cooperative research agreement with ARS. A manuscript is being prepared for submission to a peer-reviewed scientific publication.

Plant sterols are ingredients in a number of fat-based foods on the market including salad dressings and margarines. Potential dietary benefits of plant sterols, including cholesterol reduction, have been studied for decades. Judd said the Beltsville study was unique in examining plant sterols as an ingredient in low-fat foods and as part of a tightly controlled low-fat diet. Most studies have looked at sterol effects in higher fat foods.

The soybean extracts used in the Beltsville study are compounds known as sterol esters. Their molecular structure is similar to cholesterol. Judd said sterol esters most likely lowered the volunteers' cholesterol by limiting its intestinal absorption.

The volunteers began the study with their levels of "bad" (LDL) cholesterol in the mildly elevated range. For six weeks, they ate all their meals at the Beltsville center. For three of those weeks, their daily diet included 2.2 grams of soybean sterols as an ingredient in salad dressing. On the low fat diet alone--without plant sterols--the volunteers' total and "bad" cholesterol levels dropped 7.3 and 8.4 percent, respectively. With the sterols, the reductions were nearly double: 14.1 and 18.2 percent. "I was surprised at the magnitude of the effect," said Judd, with the Beltsville center's Diet and Human Performance Laboratory. "And, the volunteers' levels of 'good' (HDL) cholesterol stayed the same."

Overall fat intake in the study diet amounted to 32 percent of total calories. A 36-percent fat diet is about the average for American adults.

Curiously, five of the 53 volunteers lowered their cholesterol only during the part of the study that included sterol esters. "Many people with high cholesterol," Judd noted, "do not respond to a low-fat diet alone and rely on cholesterol-lowering drugs. The question is, could dietary plant sterols also help these kinds of people?"

Judd conducted the study with physiologist David Baer of the Diet and Human Performance Laboratory; chemist Beverly Clevidence, who leads the center's Phytonutrients Laboratory; and nutrition scientists Shirley Chen and Gert Meijer of Lipton.

"We want to learn how plant sterols could affect cholesterol in people eating their own diets," Judd said. "So, we plan to extend our investigation of plant sterols to study about 100 free-living volunteers who will eat their usual diets instead of a controlled diet."

The sterols used in the study already occur--in low concentrations--in many raw and refined vegetable-based foods including vegetable oils. A typical American diet provides approximately 0.25 g of plant sterol per day. "It would be impractical to try to consume 2.2 grams a day of sterols from refined oils or other foods," Judd said.

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