

# Fruits and Veggies— Good for Our Good Cholesterol

**H**eat specialists don't always want to lower cholesterol. In the case of HDL cholesterol, they like to see it go up.

The HDL particle vacuums up excess cholesterol from cells and returns it to the liver, enabling the cells to open their doors to the LDL particles. This prevents the LDL particles from hanging around in the arteries and hooking up with bad company—the oxidizers. When that happens, an artery-clogging plaque may form.

So Paul F. Jacques and colleagues at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston looked into whether increasing vitamin C intake could help.

They recruited 138 men and women aged 20 to 65 to take either a 1-gram vitamin C supplement or a look-alike placebo every day for 8 months. To prevent any bias, neither researchers nor volunteers knew who was getting which pill.

Jacques, an epidemiologist, Ernst J. Schaefer, a physician, and colleagues Sandra Sulsky, Gayle Perrone, and Jennifer Jenner wanted to see if extra vitamin C would or wouldn't raise HDL cholesterol. Many studies—both experimental

and observational—have shown a positive correlation between the amount of vitamin C circulating in people's blood and their HDL cholesterol levels. But other studies have found no relationship, explains Jacques. So the subject has remained controversial.

And no wonder. The results of this study were also mixed, depending on how much ascorbic acid (vitamin C) the volunteers had running in their veins to begin with.

“We saw no effect of the vitamin C supplements on HDL cholesterol among the volunteers who began the study with plasma ascorbic acid levels at or above 1 milligram per deciliter,” he says. “But there was a significant effect among a subset of the volunteers who began with plasma ascorbic acid levels below 1 mg/dL.”

Their HDL levels increased an average 7 percent, he says, while total cholesterol/HDL cholesterol—a ratio used to evaluate cholesterol status—dropped 8 percent. About one-third of the volunteers fell into the group with low plasma ascorbic acid.

Nationwide, it's a higher percentage, says ARS vitamin C expert Robert A. Jacob.

“Among U.S. adults who don't take supplements containing vitamin C, more than half have plasma ascorbic acid levels below 1 mg/dL.”

But it's easy to increase vitamin C levels without supplements,

Jacob adds, noting that 75 to 80 percent of U.S. adults don't take them regularly.

“Eating five serv-

ings of fruits and vegetables a day will put plasma levels above the 1 mg/dL mark. These foods also provide other protective substances besides antioxidants. And many protective substances in plant foods are still being discovered—so they're not in supplements.

“Even three to four servings of the top vitamin C sources would probably do,” Jacob says. Citrus, potatoes, broccoli, cauliflower, strawberries, papayas, and many dark, leafy greens are excellent sources of the vitamin.

Jacques says the 43 people who began the study with low plasma ascorbic acid also had significantly lower HDL levels than those who had at least 1 mg/dL of ascorbic acid circulating through their bodies.

The low-ascorbic-acid group consumed more fat and obviously less vitamin C, based on a lengthy questionnaire on the volunteers' living habits. And their triglycerides, total cholesterol, and LDL cholesterol—the artery-damaging kind—were significantly higher. But none of these risk factors for heart disease improved with vitamin C supplements . . . another reason to get the vitamin from fruits and vegetables.—By **Judy McBride, ARS.**

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