

New evidence that natural substances in green coffee beans help control blood sugar levels

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Scientists today described evidence that natural substances extracted from unroasted coffee beans can help control the elevated blood sugar levels and body weight that underpin type 2 diabetes. Their presentation on chlorogenic acids—widely available as a dietary supplement—was part of the 245th National Meeting & Exposition of the American Chemical Society (ACS), being held here this week.

Joe Vinson, Ph.D., who led the research, pointed out that type 2 [diabetes](#), the most common form of diabetes, is an increasing global health problem. In the United States alone, almost 26 million have the disease, in which the pancreas does not produce enough of the insulin that enables the body to use sugar, or cells resist the effects of that insulin. [Blood sugar levels](#) rise, increasing the risk of heart attacks, stroke and other health problems. Current treatments focus on oral medications that stimulate insulin secretions and/or reduce insulin resistance, dietary changes that control [blood sugar](#) levels and weight loss that reduces insulin resistance.

"A simple natural pill or capsule that would both help control blood sugar and foster weight loss at the same time would be a major advance in the treatment of type 2 diabetes," Vinson said. "Our own research and studies published by other scientists suggest that such a treatment may, indeed, exist. There is significant epidemiological and other evidence that [coffee](#) consumption reduces the risk of [type 2 diabetes](#)."

"One large study indicated a 50 percent risk reduction for people who drank seven cups of coffee a day compared to those who drank only two cups a day. I am trying to make the coffee and diabetes story as clear as possible for the public. The evidence points to chlorogenic acids as the active ingredients in coffee that both prevent diabetes and improve glucose control in normal, pre-diabetic and diabetic people."

Chlorogenic acids are a family of substances that occur naturally in apples, cherries, plums, dried plums and other fruits and vegetables. Vinson, who is with the University of Scranton in Pennsylvania, which funded the research, pointed out that coffee — due to its popularity as a beverage — is a major dietary source of these substances. Large amounts of chlorogenic acids exist in green, or unroasted, [coffee beans](#). However, the high temperatures used to roast coffee beans to make them suitable for use in coffee breaks down much of the chlorogenic acids. Thus, the focus has been on using concentrated extracts of green coffee beans, which contain higher amounts of chlorogenic acids.

In a previous study, Vinson found that overweight or obese people who took such an extract lost about 10 percent of their body weight in 22 weeks. The new study sought to document the effects of various doses of a commercial green coffee extract on the blood sugar levels of 56 men and women with normal blood sugar levels. They got a glucose tolerance test to see how their bodies responded to the sugar. Then over a period of time, they took 100, 200, 300 or 400 milligrams (mg) of the extract in a capsule with water. Follow-up glucose tolerance tests showed how the green coffee extract affected their responses.

"There was a significant dose-response effect of the green coffee extract and no apparent gastrointestinal side effects," Vinson said. "All doses of green coffee extract produced a significant reduction in blood sugar relative to the original blank glucose challenge. The maximum blood glucose occurred at 30 minutes and was 24 percent lower than the

original with the 400 mg of green coffee extract and the blood glucose at 120 minutes was 31 percent lower."

More information: Abstract

There are now numerous epidemiological studies indicating that coffee consumption, especially decaffeinated coffee, will reduce the risk of all-cause mortality, heart failure and type 2 diabetes and Parkinson's disease. The studies' results are usually J-curves indicating an optimal consumption of 2-4 cups/day. The question then arises, what is/are the bioactive substance(s) in coffee—Our study of antioxidants in foods and beverages indicated the coffee is the #1 source of polyphenol antioxidants in the US diet and this has been borne out in several European countries. Recent studies indicate that coffee consumption acutely increases human plasma antioxidant capacity. Other investigators have found multiple evidence of chlorogenic acid metabolites and colonic bacterial degradation products in plasma and urine after drinking coffee and green coffee extract. A recent study in India with obese subjects showed a significant weight loss and body fat reduction after consuming capsules containing a green coffee extract which was high in chlorogenic acids. Roasting is known to greatly reduce the levels of these compounds in the beverage coffee. One mechanism for the weight loss is purported to be the inhibition of glucose-6-phosphatase which forces lipids to be used as energy to compensate for the decrease in glucose release from glycogenolysis in the liver. As evidence for coffee's diabetes and heart disease protection we will present a new human study demonstrating a dose-response green coffee extract inhibition of glucose absorption during a glucose tolerance test in normal subjects. Studies with rats and humans have shown that the caffeine in coffee contributes to hyperglycemia after glucose consumption. The green coffee extract which is very low in caffeine and should be studied with pre-diabetes and type 2 diabetic subjects as a means to improve their blood glucose control.

Provided by American Chemical Society

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