

# Lab experiments question effectiveness of green coffee bean weight-loss supplements

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A major ingredient in those green coffee bean dietary supplements—often touted as "miracle" weight-loss products—doesn't prevent weight gain in obese laboratory mice fed a high-fat diet when given at higher doses. That's the conclusion of a first-of-its-kind study published in ACS' *Journal of Agricultural and Food Chemistry*. It also linked the ingredient to an unhealthy build-up of fat in the liver.

Vance Matthews, Kevin Croft and their team note that coffee is rich in healthful, natural, plant-based polyphenol substances. They cite evidence from past studies that [coffee drinkers](#) have a lower risk of obesity, high blood pressure, type 2 diabetes and other disorders collectively termed the "metabolic syndrome." Chlorogenic acid (CGA), one coffee polyphenol, is the main ingredient in scores of dietary supplements promoted as weight-loss products. Much research has been done on mixtures of coffee polyphenols. Until now, however, scientists have not checked the effects of higher doses of CGA alone on obesity and other symptoms of the metabolic syndrome. Matthews' team decided to do that, using special [laboratory mice](#) that are stand-ins for humans in such tests.

They report that mice on a high-fat diet and mice on a high-fat diet plus CGA gained the same amount of weight. The CGA mice, however, were more likely to develop disorders that often lead to [type 2 diabetes](#). They also accumulated fat inside the cells in their livers. "This study suggests that higher doses of CGA supplementation in a high-fat diet does not protect against features of the metabolic syndrome in diet-induced obese mice," they say.

**More information:** "Supplementation of a High-Fat Diet with Chlorogenic Acid Is Associated with Insulin Resistance and Hepatic Lipid Accumulation in Mice" J. Agric. Food Chem., 2013, 61 (18), pp 4371–4378 [DOI: 10.1021/jf400920x](#)

## Abstract

The increasing prevalence of the metabolic syndrome requires a greater need for therapeutic and prevention strategies. Higher coffee consumption is consistently associated with a lower risk of type 2 diabetes in population studies. Dietary polyphenols have been linked to benefits on several features of the metabolic syndrome. Chlorogenic acid (CGA), a major component of coffee, is one of the most consumed

polyphenols in the diet. In our study, we conducted a controlled dietary intervention over 12 weeks in male mice. There were three dietary groups: (i) normal diet, (ii) high-fat diet, and (iii) high-fat diet + CGA. We assessed the effect of CGA at a physiologically obtainable dose (1 g/kg of diet) on high-fat-diet-induced obesity, glucose intolerance, insulin resistance, and also fatty acid oxidation and insulin signaling in C57BL/6 male mice. Supplementation of CGA in the high-fat diet did not reduce body weight compared to mice fed the high-fat diet alone ( $p = 0.32$ ). CGA resulted in increased insulin resistance compared to mice fed a high-fat diet only ( $p$

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