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Previous stories pertaining to Professor Belury's research:

["Dietary Oil May Need Help In Avoiding Any Side Effects Of Weight Loss,"](#)
4/9/08.

["Weight-Loss Supplement Shows Good And Bad](#)

TWO DIETARY OILS, TWO SETS OF BENEFITS FOR OLDER WOMEN WITH DIABETES

COLUMBUS, Ohio – A study comparing how two common dietary oil supplements affect body composition suggests that both oils, by themselves, can lower body fat in obese postmenopausal women with [Type 2 diabetes](#).

The two oils compared were safflower oil, a common cooking oil, and [conjugated linoleic acid \(CLA\)](#), a compound naturally found in some meat and dairy products that has been associated with weight loss in previous studies. Both are composed primarily of polyunsaturated fatty acids, which are considered “good fats” that, when consumed in proper quantities, are associated with a variety of health benefits.

In the study, 16 weeks of supplementation with [safflower oil](#) reduced fat in the trunk area, lowered blood sugar and increased muscle tissue in the women participants.

Conjugated linoleic acid supplementation for the same length of time, on the other hand, reduced total body fat and lowered the women’s body mass index (BMI), a common health measure of weight relative to height.

All of the women in the study took one oil for 16 weeks, followed by the other oil for an equal amount of time. The participants were instructed not to change their diets or exercise patterns over the course of the study so the research would measure the effects of only the supplementation.

“Making this subtle change in the intake of high-quality dietary fats in an effort to alter body composition is both achievable and affordable to postmenopausal women in the United States who are managing the difficult combination of obesity and diabetes,” said [Martha Belury](#), professor of [human nutrition at Ohio State University](#) and senior author of the study.



Martha Belury

[Traits.](#) 1/30/07.

["Fat That May Benefit Diabetics Reduces Weight, Blood Sugar."](#) 1/24/03.

["Scientists Suspect Omega-3 Fatty Acids Could Slow Acute Wound Healing,"](#) 7/23/08.

["Omega-3 Fatty Acids Affect Risk Of Depression, Inflammation,"](#) 3/28/07.

Among the most surprising findings: that in 16 weeks, these women could lose between about two pounds and four pounds of trunk fat simply by taking safflower oil supplements.

"I never would have imagined such a finding. This study is the first to show that such a modest amount of a linoleic acid-rich oil may have a profound effect on body composition in women," Belury said. The dose of either oil taken each day was approximately 1 2/3 teaspoons.

Postmenopausal women tend to lose muscle at the same time that body fat accumulates toward their middle, so this research shows how dietary oils can complement lifestyle and medication in helping older diabetic women manage their health, she said.

The research appears online and is scheduled for later print publication in the [American Journal of Clinical Nutrition](#).

Thirty-five women participated in the study. All were considered obese based on their BMI measures of 30 or higher, were postmenopausal but younger than age 70, and had Type 2 diabetes but did not need to take insulin to treat the disease. Many did take other medications, such as those used to manage blood sugar levels, cholesterol or blood pressure.

The women were randomized into two groups to determine which supplement they took first. Each initial 16-week supplementation was followed by a four-week washout period to remove the first supplement from their systems before the next 16-week supplementation period began. The supplements were contained in eight pills; the women took two pills four times per day, at meals and bedtime.

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"We'd love it if women could use diet, activity and other aspects of a healthy lifestyle to manage their health. But most will probably be on oral medications for the rest of their lives for managing their diabetes and metabolism, which is fine as long as the medications work. We think there's a chance that nutrition can complement medication and help drugs work even better."

“The power of the crossover is that it tells you the different effects of the dietary oils in the same woman,” Belury said.

The daily supplementation contained 6.4 grams of each oil’s active fatty acid: [linoleic acid](#) in safflower oil and, in CLA, specific fatty acid isomers – compounds that share the same chemical formula but differ in chemical structure.

The researchers used [dual-energy X-ray absorptiometry](#), commonly known as DXA and usually used to measure bone density, to determine the women’s baseline and follow-up lean mass and fat throughout their bodies and specifically in their trunk region.

Researchers asked the participants to keep diet and activity records for three consecutive days at four points over the course of the study to account for the potential for calorie intake or exercise to affect the results, Belury said. Physical activity remained unchanged throughout the study, and no significant differences were seen between the two groups’ reported calorie intake.

The study showed that CLA supplementation significantly decreased body mass index and total body fat over both diet periods, typically showing effects in the last half of each 16-week period. The BMI levels of the women taking CLA dropped on average by about half a point, and their total body fat decreased by an average of 3.2 percent, reducing the weight of the fat tissue by an average of between 2.3 pounds and 3.5 pounds.

Safflower oil supplementation showed no effect on total body fat readings, but reduced the weight of trunk fat tissue by between 2.6 pounds and 4.2 pounds, or an average of 6.3 percent. It also increased lean tissue, or muscle, by between an average of about 1.4 pounds and 3 pounds.

Safflower oil also lowered fasting blood sugar levels by between 11 and 19 points on average. Blood sugar is considered normal if it falls below 110 milligrams per deciliter; the women’s average blood sugar levels ranged from 129 to 148 after 16 weeks of safflower oil supplementation.

“Lowering fasting glucose is important for these women. The overall effect in just 16 weeks wasn’t bringing them back to normal, but safflower oil still improved it significantly,” Belury said.

The dietary oils did not have significant effects on other health

measurements, such as waist circumference, waist-to-hip ratio and skinfold thickness measures of body fat, Belury noted.

The CLA also did not appear to affect the variety of hormones involved in fat burning. However, safflower oil increased a hormone called adiponectin. Increasing this hormone may have instilled an improved ability to burn dietary fats, said Belury, who hopes to investigate this mechanism in a follow-up study.

Belury said that other work she is conducting in animals suggests that at least in the case of CLA, the fatty acid appears to allow the body to burn calories in a heat-producing way. Questions remain about the long-term safety of any kind of supplementation that lowers body fat, because some research has suggested that the fat that leaves fat tissue ends up in the liver or muscles – a condition that could lead to insulin resistance and diabetes if that fat can't be used.

Neither CLA nor the linoleic acid in safflower oil is naturally produced in the human body, so both must be obtained from food or dietary supplements. Linoleic acid is an omega-6 fatty acid that is important in growth and maintenance of tissues and lipid metabolism. The [American Heart Association](#) recently issued recommendations suggesting that [omega-6 fatty acids](#) are among the polyunsaturated fats that should be consumed for heart health.

CLA is found naturally in trace amounts primarily in beef, lamb and milk, but obtaining levels comparable to those used in Belury's study likely requires concentrated doses similar to those found in dietary supplements.

“Essentially what we're trying to understand with nutrition is how dietary approaches can complement Westernized medicine,” Belury said. “In an ideal world, we'd love it if women like those in our study could use diet, activity and other aspects of a healthy lifestyle to manage their health. But most will probably be on oral medications for the rest of their lives for managing their diabetes and metabolism, which is fine as long as the medications work. We think there's a chance that nutrition can complement medication and help drugs work even better.”

Co-authors on the study were Leigh Norris, Angela Collene, Michelle Asp, Li-Fen Liu and Julia Richardson of Ohio State's Department of Human Nutrition; Jason Hsu and Dongmei Li of the [Department of Statistics](#); Kwame Osei and Rebecca Jackson of the Department of Internal Medicine's [Division of Endocrinology](#), Diabetes and Metabolism; and Doris Bell of [Cognis](#), provider of an unrestricted monetary gift and a dietary oil

donation for the research.

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