

Olive Oil May Help Increase Fat-Burning in the Obese

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A cornerstone of olive oil's health benefits lies in its high levels of antioxidants called polyphenols (1), which have been shown to help maintain cell health (2), digestive health (3) and elicit "a protective effect" again cardiovascular disease risk factors (4). Two such polyphenols are oleuropein and caffeic acid. These have been shown to help with blood sugar health anti-diabetic (5, 6), heart health (7), and help maintain healthy levels of inflammation (8).

Now a new study in rats (9) suggests that olive oil polyphenols may help maintain heart health in the presence of obesity. Research has shown that increased calorie intake seen in obese people causes cell damage ("oxidation") (10) by decreasing ability of cells to make energy in structures called mitochondria (11), causing overall decrease oxygen intake in obese people (12). As a result, the researchers sought to study whether the antioxidants in olive oil can help with cell damage, thereby increasing oxygen intake and overall energy output.

In the study, 48 male wistar rats (24 in each group) were given either a standard diet (70 calories/day = 2.75 calories/gram of "metabolizable energy") or higher-calorie diet (86 calories/day = 3.41 calories/gram "metabolizable energy") for 3 weeks. Each group of 24 was then divided into 4 smaller groups of 6, with the standard diet group receiving:

- Standard diet and saline (control group)
- Standard diet plus olive oil (3 grams per kg of bodyweight per day)
- Standard diet plus a specific olive oil antioxidant (oleuropein - 0.023mg/kg/day),
- Standard-chow with caffeic-acid (2.66mg/kg/day)

And the high-calorie group receiving:

- High-calorie chow plus saline (control)
- High-calorie chow and olive-oil
- High-calorie chow and oleuropein
- High-calorie chow and caffeic-acid.

Treatments were given twice a week for another 3 weeks.

At the end of the 42-day study, control rats fed the higher-calorie diet weighed 16% more compared to the control standard diet (397 vs. 335 grams). As expected, the weight in the in the high-calorie control group produced a 9% lower rate of oxygen intake (3.46 vs. 3.8 milliliters/minute) and 62% lower fat-burning (1.38 vs. 3.5 mg/min).

In the standard diet group, rats taking olive oil and caffeic acid had 26% (4.77 vs. 3.8 ml/min) and 17% (4.45 vs. 3.8 ml/min) higher oxygen intake and 58% (5.55 vs. 3.50 mg/min) and 30% (4.55 vs. 3.5 mg/min) higher rates of fat-burning, respectively. Rats in the oleuropein group had lower rates of both oxygen intake (9% lower – 3.44 vs. 3.8 ml/min) and fat-burning (46% lower – 1.92 vs. 3.5 mg/min) compared to the standard control group. When trying to explain a possible mechanism, the researchers cited oleuropein's ability to increase carbohydrate use, producing energy without fat-burning (13).

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In the obese group, oxygen intake was 4% higher (3.6 vs. 3.46 ml/min) for olive oil, 9% higher (3.78 vs. 3.46 ml/min) for oleuropein, and 16% higher (4.00 vs. 3.46 ml/min) for caffeic acid. Even better improvements were seen regarding fat-burning for olive oil (139% higher – 3.31 vs. 1.38 mg/min), oleuropein (106% higher – 2.85 vs. 1.38 mg/min) and caffeic acid (147% higher – 3.42 vs. 1.38 mg/min).

For the researchers, "The present study demonstrated for the first time that olive-oil, oleuropein and caffeic-acid enhanced fat-oxidation and optimized cardiac energy metabolism in obesity conditions."

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