

Citrus could help fight effects of obesity, study finds

A group of researchers has found that citrus fruits help prevent harmful effects of obesity in mice fed a Western-style, high-fat diet.

The Brazilian scientists presented their findings on the weekend at the National Meeting & Exposition of the American Chemical Society (ACS).

“Our results indicate that in the future we can use citrus flavanones, a class of antioxidants, to prevent or delay chronic diseases caused by obesity in humans,” graduate student Paula S. Ferreira said.

More than one-third of all adults in the U.S. are obese, according to the U.S. Centers for Disease Control and Prevention.

Being obese increases the risk of developing heart disease, liver disease and diabetes, most likely because of oxidative stress and inflammation, Ferreira said.

When humans consume a high-fat diet, they accumulate fat in their bodies. Fat cells produce excessive reactive oxygen species, which can damage cells in a process called oxidative stress.

The body can usually fight off the molecules with antioxidants, but obese patients have very enlarged fat cells, which can lead to even higher levels of reactive oxygen species that overwhelm the body's ability to counteract them.

Citrus fruits contain large amounts flavanones, which previous studies have linked to lowering oxidative stress in vitro and in animal models.

In this study, the researchers wanted to observe the effects of citrus flavanones for the first time on mice with no genetic modifications and that were fed a high-fat diet.

The team, at Universidade Estadual Paulista (UNESP) in Brazil, conducted an experiment with 50 mice, treating them with flavanones found in oranges, limes and lemons.

The flavanones they focused on were hesperidin, eriocitrin and eriodictyol. For one month, researchers gave groups either a standard diet, a high-fat diet, a high-fat diet plus hesperidin, a high-fat diet plus eriocitrin or a high-fat diet plus eriodictyol.

The high-fat diet without the flavanones increased the levels of cell-damage markers called thiobarbituric acid reactive substances (TBARS) by 80% in the blood and 57% in the liver compared to mice on a standard diet.

However, hesperidin, eriocitrin and eriodictyol decreased the TBARS levels in the liver by 50%, 57% and 64% respectively, compared with mice fed a high-fat diet but not given flavanones. Eriocitrin and eriodictyol also reduced TBARS levels in the blood by 48% and 47%, respectively, in these mice.

“Our studies did not show any weight loss due to the citrus flavanones,” team leader Thais B. Cesar said.

“However, even without helping the mice lose weight, they made them healthier with lower oxidative stress, less liver damage, lower blood lipids and lower blood glucose.”

Ferreira said the study also suggested consuming citrus fruits ‘probably could have beneficial effects’ for people who are not obese, but have diets rich in fats.

The team's next goal is to explore how best to administer these flavanones, whether in citrus juice, by consuming the fruit or developing a pill with these antioxidants. There are also plans to conduct studies involving humans.

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