

A healthy diet with less sugar linked to younger biological age

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Researchers at UC San Francisco have found a link between following a diet that is rich in vitamins and minerals, especially one without much added sugar, and having a younger biological age at the cellular level.

They looked at how three different measures of healthy eating affected an "[epigenetic clock](#)"—a biochemical test that can approximate both health and lifespan—and found that the better people ate, the younger their cells looked. Even when people ate healthy diets, each gram of added sugar they consumed was associated with an increase in their epigenetic age.

"The diets we examined align with existing recommendations for preventing disease and promoting health, and they highlight the potency of antioxidant and anti-inflammatory nutrients in particular," said Dorothy Chiu, Ph.D., a postdoctoral scholar at the UCSF Osher Center for Integrative Health and first author of the study, which appears July 29 in *JAMA Network Open*.

"From a lifestyle medicine standpoint, it is empowering to see how heeding these recommendations may promote a younger cellular age relative to chronological age."

The study is one of the first to show a link between added sugar and epigenetic aging, and the first to examine this link in a heterogeneous group of women—both Black and white—in midlife. Most studies on the topic have involved older white participants.

The study helps deepen our understanding of why sugar is so detrimental to health, added study co-senior author Elissa Epel, Ph.D., a UCSF professor in the Department of Psychiatry and Behavioral Sciences.

"We knew that high levels of added sugars are linked to worsened metabolic health and early disease, possibly more than any other dietary factor," Epel said. "Now we know that accelerated epigenetic aging is underlying this relationship, and this is likely one of many ways that excessive sugar intake limits healthy longevity."

Women in the study reported consuming an average of 61.5 grams of added sugar per day, though the range was large: from 2.7 to 316 grams of added sugar daily. A bar of milk chocolate has about 25 grams of added sugar, while a 12-ounce can of cola has about 39 grams. The U.S. Food and Drug Administration recommends adults consume no more than 50 grams of added sugar per day.

A nutrient-based approach

For the cross-sectional study, researchers analyzed [food](#) records from 342 Black and [white women](#) with a mean age of 39 years from Northern California. Then, they compared their diets with epigenetic clock measures, which were derived from saliva samples.

Researchers scored the women's diets to see how they compared to a Mediterranean-style diet rich in anti-inflammatory and antioxidant foods and then to a diet linked to lower risk for chronic disease.

Finally, they scored the women's diets against a measure they created called the "Epigenetic Nutrient Index (ENI)", which is based on nutrients (not foods) that have been linked to anti-oxidative or anti-inflammatory processes and DNA maintenance and repair. These include Vitamins A, C, B12 and E, folate, selenium, magnesium, dietary fiber and isoflavones.

Adherence to any of the diets was significantly associated with lower epigenetic age, with the Mediterranean diet having the strongest association.

The researchers examined sugar intake separately and found that consuming foods with added sugar was associated with accelerated biological aging, even in the presence of an otherwise healthy [diet](#).

"Given that epigenetic patterns appear to be reversible, it may be that eliminating 10 grams of added sugar per day is akin to turning back the biological clock by 2.4 months, if sustained over time," said co-senior author Barbara Laraia, Ph.D., RD, a UC Berkeley professor in the Food, Nutrition and Population Health program. "Focusing on foods that are high in key nutrients and low in added sugars may be a new way to help motivate people to eat well for longevity."

Provided by University of California, San Francisco

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