

Eating Fruits, Vegetables and Whole Grains May Increase Chance of Early Onset Lung Cancer

Pesticide residue may play a role in increased rates of lung cancer in non-smokers under age 50.

April 17, 2026 By Keck Medicine of USC

Los Angeles — A diet rich in fruit, vegetables and whole grains is generally recommended for better health and to lower the risk of cancer and other diseases.

However, new [research](#) from [USC Norris Comprehensive Cancer Center](#), part of Keck Medicine of USC, presented at the [annual meeting of the American Association for Cancer Research](#) suggests that this type of diet may put non-smoking Americans under the age of 50 at greater risk of developing lung cancer.

“Our research shows that younger non-smokers who eat a higher quantity of healthy foods than the general population are more likely to develop lung cancer,” said [Jorge Nieva, MD](#), a medical oncologist and lung cancer specialist with USC Norris and lead investigator of the study. “These counter-intuitive findings raise important questions about an unknown environmental risk factor for lung cancer related to otherwise beneficial food that needs to be addressed.”

Nieva and his fellow researchers speculate that this risk factor may be the pesticides used to keep crops pest-free. Commercially produced (non-organic) fruits, vegetables and whole grains are more likely to be associated with a higher residue of pesticides than dairy, meat and many processed foods, according to Nieva. He also notes that agricultural workers exposed to pesticides typically have higher rates of lung cancer, which adds credence to the theory.

The study also showed that young women who don’t smoke have a higher incidence of lung cancer than men, and that women tended to also have a diet higher in produce and whole grains than men.

A New Epidemic of Lung Cancer

Lung cancer has typically been a disease that affects older adults (the average age of lung cancer onset is 71), men more than women, and smokers.

Smoking rates have fallen since the mid-1980s, which has led to fewer lung cancer cases across the United States, except for one unique group — non-smokers age 50 and younger, especially women, who are now more likely to get lung cancer than men.

To investigate this trend, researchers launched the Epidemiology of Young Lung Cancer Project, which surveyed 187 patients who were diagnosed with lung cancer by age 50. Patients provided details on demographics, diet, smoking history and lung cancer diagnosis.

Most patients had never smoked and had a form of lung cancer biologically different from lung cancer caused by smoking. A 2021 study from the Epidemiology of Young Lung Cancer Project, the Genomics of Young Lung Cancer Project, found that the subtypes of lung cancer seen in people under 40 were distinct from lung cancer in older adults.

Researchers used the Healthy Eating Index (HEI), a ranking of the overall quality of Americans' diet on a scale of 1-100, to compare patients' diets with the broader United States population. Young non-smoking lung cancer patients had an average HEI score of 65 out of 100, compared to the national average of 57. Among participants in the study, women had higher HEI scores than men.

On average, the young lung cancer patients ate more daily servings of fruit, vegetables and whole grains than the general population. For example, participants averaged 4.3 servings of dark green vegetable and legumes and 3.9 servings of whole grains per day, while the average U.S. adult eats 3.6 servings of dark green vegetables and legumes and 2.6 servings of whole grains per day.

More Research Needed

The link between pesticides and lung cancer in young people, especially women, needs more research, said Nieva.

In the study, researchers did not test specific foods for pesticides. Instead, they used published data on average pesticide levels for food categories such as fruits, vegetables and grains to estimate exposure. The next step, said Nieva, is to confirm the link by directly measuring pesticide levels in blood or urine samples from patients. This could also help reveal whether or not some pesticides increase lung cancer risk more than others.

"This work represents a critical step toward identifying modifiable environmental factors that may contribute to lung cancer in young adults," said Nieva. "Our hope is that these insights can guide both public health recommendations and future investigation into lung cancer prevention."

The research is supported by the Addario Lung Cancer Medical Institute, a nonprofit focused on advancing lung cancer research and care, as well as AstraZeneca, the Beth Longwell Foundation, Genentech, GO2 for Lung Cancer and Upstage Lung Cancer.

Researchers also received funding from the National Institutes of Health, grant number R25CA225513 and the National Cancer Institute, grant number P30CA014089.

This [news release](#) was published by Keck Medicine on April 17, 2026.

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