

High Consumption of Ultra-Processed Foods May Be Linked to Cancer Survivors' Risk of Death

People with cancer who ate the most ultra-processed foods had a 57% higher risk of cancer death compared with those who ate the least.

February 5, 2026 By American Association for Cancer Research

Cancer survivors who consumed higher amounts of ultraprocessed foods as part of their diet had a significantly increased risk of both all-cause and cancer-specific death, according to a study published in [Cancer Epidemiology, Biomarkers & Prevention](#), a journal of the American Association for Cancer Research (AACR).

Ultraprocessed foods can be considered unhealthy because they are often low in essential nutrients such as vitamins, minerals, and fiber, and the industrial processing methods used to produce them introduce additives, artificial flavorings, preservatives, emulsifiers, and high levels of added sugars and unhealthy fats that the body is not well adapted to handle, explained lead author Marialaura Bonaccio, PhD, of the Research Unit of Epidemiology and Prevention at IRCCS Neuromed in Pozzilli, Italy. With the consumption of ultraprocessed foods on the rise in many countries around the world, Bonaccio said it is important to better understand whether eating less ultraprocessed food could help cancer survivors live longer and healthier lives.

“What people eat after a cancer diagnosis may influence survival, but most research in this population has focused only on nutrients, not how processed the food is,” Bonaccio said. “The substances involved in the industrial processing of foods can interfere with metabolic processes, disrupt gut microbiota, and promote inflammation. As a result, even when an ultraprocessed food has a similar calorie content and nutritional composition on paper compared to a minimally processed or ‘natural’ food, it could still have a more harmful effect on the body.”

In the Moli-sani Study, a prospective cohort study, Bonaccio and colleagues followed 24,325 individuals from March 2005 to December 2022 who were 35 or older at study initiation and lived in the Southern Italian region of Molise. Within this cohort, they identified 802 cancer survivors at baseline (476 women and 326 men) who had provided thorough information about their diet via the European Prospective Investigation into Cancer and Nutrition (EPIC) food frequency questionnaire. The [NOVA classification system](#), which assigns foods into one of four groups based on the level and purpose of processing, was used to classify whether a food was ultraprocessed.

The amount of ultraprocessed foods in each individual's diet was then calculated in two ways: weight ratio (which divided the total weight of ultraprocessed foods consumed each day by the total weight of food and beverages consumed each day) and the energy ratio (which divided the total calories from ultraprocessed foods each day by the total calories consumed each day). Individuals were then divided into three groups based on the weight ratio of ultraprocessed foods consumed. The researchers also adjusted for multiple factors including demographic factors, smoking status, body mass index, leisure-time physical activity, medical history, cancer type, and overall diet quality based on the Mediterranean Diet Score.

During a median follow-up of 14.6 years, there was a total of 281 deaths among the 802 cancer survivors. Individuals in the highest third of ultraprocessed food consumed by weight ratio had a 48% higher rate of death from any cause and a 57% higher rate of death from cancer compared with those in the lowest third. A higher energy ratio of ultraprocessed foods showed similar results for cancer death, but not other causes.

"Some foods may weigh a lot but contribute few calories, or vice versa, which is why the results can differ depending on the measure used," Bonaccio explained. "But the fact that the association between ultraprocessed foods and all-cause death persisted even after adjusting for overall diet quality suggests that the negative health effects are not explained solely by poor nutrient profiles, but that the level and nature of industrial food processing itself play an independent role in influencing long-term health outcomes."

To examine the potential biological mechanisms that may be impacted by ultraprocessed foods, Bonaccio and colleagues analyzed inflammatory, metabolic, and cardiovascular biomarkers based on samples and data collected from participants. Among the biomarkers examined, adjusting for inflammatory scores and resting heart rate attenuated the association between ultraprocessed foods and all-cause death by 37.3%.

"These results suggest that increased inflammation and elevated resting heart rate may partially explain the link between higher consumption of ultraprocessed foods and increased mortality, and help to clarify how food processing itself could contribute to worse outcomes among cancer survivors," Bonaccio said.

To better understand if the nutritional content of ultraprocessed foods made a difference, the researchers established and examined data for seven groups of ultraprocessed foods: artificially and sugar-sweetened beverages, artificial sweeteners, and spirits; dairy and cheese products; processed meat; salty snacks and savory foods; fatty spreads and sauces; starchy foods; and sugary foods and sweets.

Some groups were linked to higher mortality, while others showed no clear pattern. However, interpreting individual ultraprocessed foods is challenging, and they are best considered as a dietary pattern rather than isolated items, Bonaccio said.

"The main message for the public is that overall consumption of ultraprocessed foods matters far more than any individual item," Bonaccio said. "Focusing on the diet as a whole and reducing

ultraprocessed foods overall and shifting consumption toward fresh, minimally processed, home-cooked foods is the most meaningful and beneficial approach for health. A practical way to do this is by checking labels: Foods with more than five ingredients, or even only one food additive, are likely to be ultraprocessed.”

Limitations of this study include the fact that, as an observational study, causality cannot be inferred, dietary intakes were self-reported making them susceptible to misreporting, dietary habits could have changed over the course of the follow-up period, and the study was subject to survival bias as diet was assessed an average of 8.4 years after cancer diagnosis. Additionally, the study had a small number of deaths, which limits its statistical power, and a lack of data regarding cancer stage at the time of diagnosis.

This study was funded by the Fondazione AIRC per la Ricerca sul Cancro ETS. Bonaccio reports no conflicts of interest.

This [news release](#) was published by the American Association for Cancer Research on February 4, 2026.

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