



## Sex-specific association between ultra-processed foods and the increased risk of colorectal cancer | 1

Colorectal cancer is the third most frequently diagnosed cancer among both genders and the second leading cause of cancer death in the world. In this prospective study, researchers from the United States, Brazil, and Canada investigated the association between the consumption of ultra-processed foods (industrial ready-to-eat or ready-to-heat formulations made with little or no whole foods) and the increased risk of colorectal cancer with almost 30 years of follow-up.

Ultra-processed foods usually contain additives such as emulsifiers and artificial sweeteners. Newly formed contaminants with carcinogenic potential (e.g. acrylamide) are found in various ultra-processed products that have undergone heat treatment, like French fries. Ultra-processed foods may also contain contaminants that migrate from plastic packaging, such as bisphenol-A, which the European Chemicals Agency considers “a substance of serious concern.” The food additives can change the gut microbiota, promoting inflammation and carcinogenesis in the colon.



### ***About the Study***

This investigation included three large prospective cohorts: The Nurses’ Health Study which enrolled 121,700 registered female nurses aged 30 to 55 from 1976, The Nurses’ Health Study II which enrolled 116,429 female nurses aged 25 to 42 from 1989, and the Health Professionals Follow-up Study which enrolled 51,529 male health professionals aged 40 to 75 from 1986.

They were followed up for almost 30 years. Initially and every two years thereafter, study



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participants were mailed a questionnaire collecting information about demographics, lifestyle, and health problems. The average follow-up rate was higher than 90% for all three cohorts. During 24 to 28 years of follow-up, 3216 cases of colorectal cancer (men, n=1294; women, n=1922) were identified.

The categorization of ultra-processed foods was as follows. Ultraprocessed bread and breakfast foods included breakfast bars, cold breakfast cereals, English muffins, bagels, rolls, rye, white bread, and whole grain bread. Packaged sweet snacks and desserts included readymade brownies, cakes, cookies, doughnuts, pies, muffins or biscuits, sweet rolls, coffee cake, candy bars, chocolate bars, energy bars, high-protein and low-carbohydrate candy bars, apple sauce, jams, jellies, preserves, and honey.

Fats, condiments, and sauces included ketchup, red chili sauce, dressings, mayonnaise (regular and low-fat), salsa, margarine, butter spread, soy sauce, non-dairy coffee whitener, and cream cheese. Sugar or artificially sweetened beverages included caffeine-free Coke, Coke/Pepsi/Cola, dairy coffee drinks, Hawaiian punch, low-calorie soda, caffeine-free low-calorie soda, Pepsi, 7-up, other carbonated beverages, and other low-calorie Cola with caffeine. Packaged savory snacks included regular crackers, light fat-free crackers, and fat-free popcorn. Other ultra-processed foods included Nutrasweet or equivalent, other artificial sweeteners, and Splenda.

### *Results*

In men, the increased risk of colorectal cancer was positively associated with the consumption of ultra-processed foods, but the association was limited to distal colon cancer. The association remained significant after adjustments for body mass index or indicators of the diet's nutritional quality. It was independent of the Western Dietary Pattern score, the Alternative Healthy Eating Index-2010 score, and specific groups of food and nutrients associated with colorectal cancer risk. This suggests that other attributes of ultra-processed foods beyond food quality are implicated in colorectal carcinogenesis.

In women, no association was observed between the overall consumption of ultra-processed foods and the increased risk of colorectal cancer.

In men, analysis according to the subgroups of ultra-processed foods revealed a positive association between the increased risk of colorectal cancer and higher consumption of ready-to-eat products made of meat, poultry, and seafood, including bacon, beef and pork hot dogs, chicken and turkey hot dogs, salami, bologna, processed meat sandwiches, processed meats, sausages, and breaded fish cakes/pieces/sticks. Also, the increased risk of



colorectal cancer was positively associated with higher consumption of sugar-sweetened beverages.

In women, the increased risk of colorectal cancer was positively associated with higher consumption of ready-to-eat/heat-mixed dishes, such as pizza, chowder, or cream soup, soup made with bouillon, ready-made soup from cans, and French fries. Importantly, a negative association was found between the increased risk of colorectal cancer and yogurt and dairy-based desserts in women.

### *Conclusion*

This investigation conducted on three large prospective cohorts with almost 30 years of follow-up found a positive association between the overall consumption of ultra-processed foods and the increased risk of colorectal cancer in men. The association was limited to distal colon cancer. In women, a positive association was found between the increased risk of colorectal cancer and higher consumption of some subgroups of ultra-processed foods.

These findings confirm that the limitation of ultra-processed food is important for public health.

The study findings were published in the British Medical Journal.

### *Journal Reference*

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