



Cancer and Diet: Here's What You Should Know

By Dana Hudepohl
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It's expected that by the year 2030, there will be 21.7 million cases of cancer around the world, up from 14.1 million cases in 2012, according to the [World Cancer Research Fund](#). The [American Cancer Society](#) estimates that 1 in 2 men and 1 in 3 women will develop cancer in their lifetime. An estimated [40 percent](#) of cancers are preventable, and [diet can impact cancer risk](#) in several ways. In this article, we'll review the scientific research on the connections between diet and cancer.

WHAT IS CANCER?

New human cells are routinely formed as healthy cells grow and divide. It is normal for old, damaged, or abnormal cells to die, making room for these new cells. When suboptimal cells continue to replicate instead of dying out, they force out healthy cells. The spread of the unhealthy cells [can lead to cancer](#).

CAUSES OF CANCER

Causes of cancer include environmental factors, lifestyle behaviors, and genetics. Fewer than 10 percent of cancer cases are caused directly by [gene defects](#) (or mutations) passed on by parents. People who do inherit such genetic mutations can take steps to reduce their risk of developing cancer. "Time and time again, [studies](#) have shown that even if you have inherited some genes that put you at increased risk of cancer, adopting a healthy lifestyle can significantly reduce that risk," says Shireen Kassam, MBBS, PhD, a visiting professor in plant-based nutrition at the University of Winchester in England, who gave a presentation about plant-based diets and cancer at the 2020 [Plant-Based Nutrition Healthcare Conference](#).

An [estimated 42 percent](#) of cancer cases in the United States are lifestyle-related. Cigarette-smoking alone accounts for 19 percent of all cancer cases, but it's by no

means the only lifestyle factor to play a significant role in cancer risk. According to the 2020 [American Cancer Society Guideline for Diet and Physical Activity for Cancer Prevention](#), more than 1 in 6 cancer cases in the United States are related to excess body weight, physical inactivity, alcohol consumption, and/or poor nutrition. But a [2019 survey](#) by the American Institute for Cancer Research found that less than 50 percent of Americans recognize that [exercise](#), alcohol consumption, and certain dietary habits have a clear link to cancer development.

FOODS LINKED TO CANCER

The following foods and beverages have been linked to a heightened risk of cancer.

- **Alcohol**

All types of alcoholic drinks, including red wine, are [linked with cancer](#), and any level of drinking can increase cancer risk. Studies have found a dose-response connection, so the more alcohol a person drinks over time the higher the risk of developing cancer. But [even light drinkers](#) who have no more than a drink per day, as well as episodic [binge drinkers](#), have an increased risk compared with someone who does not drink. The body breaks alcohol down into a chemical called acetaldehyde, which can damage DNA and lead to tumor growth, according to the [CDC](#). According to a 2015 scientific review published in *Cancer Epidemiology*, alcohol consumption is responsible for [5.5 percent](#) of cancer cases worldwide, including head, neck, breast, colorectal, and liver cancers.

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• RED AND PROCESSED MEATS

In 2015, the World Health Organization [classified](#) processed meats as a [carcinogen](#) and red meat as a probable carcinogen, based on epidemiological studies involving [colorectal cancer](#). “When we consume processed meats, we empower gut microbes to create metabolites that spark inflammation, induce DNA damage to the cells, and fuel a pathway towards colorectal cancer,” says gastroenterologist Will Bulsiewicz, MD, MSCI, author of *Fiber Fueled*. A [study](#) of survival after the diagnosis of colorectal cancer found that those consuming large amounts of processed meats did worse.

Processed meats include:

- Hot dogs
- Sausages
- Bacon
- Salami
- Ham
- Corned beef
- Beef jerky
- Canned meats
- Meat-based sauces

Red meat includes:

- Beef
- Veal
- Pork
- Lamb
- Mutton
- Goat

Meat contains heme iron, which may contribute to carcinogenesis. Higher consumption of animal protein is associated with increased blood levels of the growth [hormone insulin-like growth factor 1 \(IGF-1\)](#), and higher levels of this growth hormone are [linked to higher levels of cancer](#).

Like meat, dairy is a source of saturated fat and IGF-1. Dairy also naturally contains sex hormones, including estrogen, [even when labeled as containing no added hormones](#). Consuming dairy products is associated with increased risk of hormone-related cancers

including [breast](#), [prostate](#), and [endometrial cancers](#). One [study](#) of women who had already been diagnosed with breast cancer found that those who ate one or more servings of high-fat dairy products every day had a 49 percent higher risk of cancer mortality compared with those who consumed less than a half serving per day.

• FAST FOOD, HIGHLY PROCESSED FOOD, AND SUGAR-SWEETENED BEVERAGES

One [study](#) found that more than 75 percent of calories consumed each day in U.S. households come from moderately processed and highly processed foods and beverages. These eating patterns can crowd out foods rich in antioxidants and other nutrients that may help reduce cancer risk.

A [2018 French study](#) of more than 100,000 people found that a 10 percent increase in ultra-processed foods was associated with an even greater increase in risk of breast, prostate, and colorectal cancers.

This could be because processed foods [promote weight gain](#), and being overweight or [obese](#) is a known risk factor for [at least 13 cancers](#), according to the International Agency for Research on Cancer. About 55 percent of cancer cases diagnosed in women and 24 percent diagnosed in men are overweight- and obesity-related cancers, according to the [CDC](#). A [2019 study](#) of nearly 60,000 postmenopausal women found during a 12-year follow-up that women who intentionally lost weight lowered their cancer risk.

CAN OVERCOOKED FOOD CAUSE CANCER?

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Cooking beef, pork, poultry, and fish at high temperatures, whether frying, broiling, or grilling, creates chemicals called heterocyclic amines (HCAs), which may increase the risk of certain cancers such as colorectal, breast, prostate, kidney, and pancreatic. Other chemicals called polycyclic aromatic hydrocarbons (PAHs) are produced during smoking or grilling, when fats and juices drip into the flame; the smoke can act as a vehicle to adhere the chemicals to the food.

Interestingly, grilling vegetables, tofu, and plant-based meat substitutes does not carry the same risk for forming HCAs and PAHs, according to the [Dana-Farber Cancer Institute](#).

Frying or burning starchy foods or grains, such as toast, cookies, and potatoes, produces a chemical called acrylamide. While high levels of acrylamide in food have been found to [increase the risk of cancer](#) in some animals, [a study by the World Cancer Research Fund](#) found there is no strong evidence of a link between eating overcooked starchy food and increased cancer risk in humans.

Still, if you would like to reduce your exposure to [acrylamide](#), the U.S. Food and Drug Administration recommends the following:

- Boil or microwave instead of frying.
- When toasting or roasting, cook only to a golden yellow color.
- Do not store raw potatoes in the refrigerator and, if roasting, first soak raw potato slices in water for 15 minutes and dab dry.

DOES SUGAR FEED CANCER?

All cells, including cancer cells, use glucose (the most basic form of sugar) for fuel, which has led some to wonder whether it's possible to "starve" cancer cells by completely eliminating sugar from one's diet. However, as [the Dana-Farber Cancer Institute notes](#), "all of our healthy cells need glucose to function, and there is no way for our bodies to let healthy cells have the glucose they need, but not give it to the cancer cells." Glucose is so fundamental to human metabolic processes that when we don't get enough of it, our bodies will synthesize glucose from protein and fat.

When it comes to sugar and cancer risk, the key factor is the form in which the sugar is consumed: as it naturally occurs in whole foods; or refined and stripped of all other nutrients.

Refined sugar intake may increase cancer risk by several mechanisms. As discussed in [the section above](#), eating a lot of refined sugars and highly processed foods often leads to weight gain, and excess body fat significantly increases the risk of [many types of cancer](#). Additionally, eating refined sugar can cause insulin spikes, which [may increase IGF-1 levels](#) and [heighten cancer risk](#). In the case of esophageal cancer, refined sugar may have a more direct impact: A [2017 clinical study](#) found that even when controlling for BMI, subjects who ate more refined, added sugars were more likely to develop Barrett's esophagus, a precondition for esophageal cancer.

But across the board, these negative outcomes are seen only with refined, added sugars. Eating fruits, veggies, and whole grains—which contain naturally occurring sugar, packaged with fiber and other vital nutrients—has not been shown to increase cancer risk (and as we'll discuss in the next sections, a diet rich in these whole plant foods can help reduce one's risk of developing and dying from certain cancers).

CAN A PLANT-BASED DIET HELP PREVENT CANCER?

Based on [robust research](#), eating a plant-predominant diet rich in fruits, vegetables, whole grains, and beans may be one of the most powerful tools in cancer prevention. "Each of these [food groups](#) have been associated with a significantly lower risk of cancer due to the high-fiber content and high levels of antioxidants and anti-inflammatory compounds," says Kassam. Plant-based diets help improve several risk factors that, left unchecked, promote the development of cancer: insulin resistance, hormone/growth factor dysregulation, oxidative stress, inflammation, carcinogen exposure, and an unhealthy gut microbiome.

"When we consume fiber-rich foods such as fruits, vegetables, whole grains, seeds, nuts, and legumes, we

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empower our gut microbes to produce short-chain fatty acids like butyrate that are anti-inflammatory and have been shown to inhibit colon cancer development,” says Bulsiewicz.

A large study in the [International Journal of Cancer](#) found that those who ate the most plant foods and least animal foods reduced their risk of cancer by 15 percent. A large Harvard [study](#) followed men and women for 34 years and measured whether they adhered to five low-risk lifestyle-related factors: never smoking; maintaining a healthy weight; regularly exercising; consuming alcohol only in moderation; and eating a healthy diet high in vegetables, fruits, whole grains, unsaturated fats, and omega-3 fats and low in red and processed meats, trans fats, and sugar-sweetened beverages. They found that just following a healthy diet reduced the risk of dying from cancer by 30 percent; adhering to all five healthy lifestyle factors reduced the risk of dying from cancer by 65 percent.

DOES A PLANT-BASED DIET MAKE A DIFFERENCE IF YOU ALREADY HAVE CANCER?

[Studies](#) have found that eating a low-fat diet rich in vegetables and whole grains can help improve [survival](#) rates for cancer patients. In a [study](#) of 1,575 people with nonmetastatic colorectal cancer, for every 5 grams of increased daily fiber consumption, there was an 18 percent lower risk of death from colorectal cancer. (Plant foods are the only source of fiber; animal products contain no fiber.) In a [study](#) looking at diet and breast cancer mortality, women who increased their intake of fruits, vegetables, and whole grains lived longer.

One area of ongoing research is [whether certain plant foods can suppress angiogenesis](#)—the process by which our bodies create new blood vessels, which cancer cells can use to grow and spread.