Can an Anti-Inflammatory Diet Reduce Cancer Risk?

An anti-inflammatory diet holds strong potential to reduce cancer risk.

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A diet to help you fight off the chronic inflammation that can play havoc with your health is not a one-and-done choice . . . it's the sum of many small choices you make each day. Ongoing low-grade inflammation increases your risk of cancer, heart disease and other chronic diseases. Despite the headlines you see about this or that anti-inflammatory food, nutrient or phytochemical, fighting inflammation—just like fighting cancer—is not a solo act.

Identifying an Anti-Inflammatory Diet

The Dietary Inflammatory Index (DII) is a single score pulling together evidence on how food-related components affect six different biomarkers of inflammation. DII scores encompass 45 individual nutrients and other components that have either pro- or anti-inflammatory potential. For example :

- Nutrients, such as folate (a B vitamin), magnesium, selenium and vitamin C are categorized as anti-inflammatory.
- Nutrients, such as saturated fat, trans fat and iron are categorized as pro-inflammatory.
- Phytochemicals, such as beta-carotene and several different flavonoid polyphenol compounds are categorized as anti-inflammatory.
- Food ingredients, such as ginger, garlic, thyme and oregano are categorized as anti-inflammatory.

The influence of a food is based on the components it contains. And no single food choice can make a diet inflammatory or anti-inflammatory. The balance of the number and portion sizes of different food choices determine the influence of overall eating habits. And indeed, when the diets of people in large observational studies were scored, higher DII scores (more pro-inflammatory) were associated with higher levels of several markers of inflammation.

What Makes an Anti-Inflammatory Diet?

The DII is one way, but not the only way, to look at how food choices can come together to create eating habits that are likely to reduce inflammation.

The Empirical Dietary Inflammatory Pattern is a scoring system created by examining how 39 pre-defined food groups predicted three major inflammatory markers in large U.S. population studies. For example, processed meat, red meat, refined grains and high-calorie beverages were identified as pro-inflammatory choices; dark yellow/orange vegetables, leafy green vegetables, tea and coffee were identified as anti-inflammatory choices.
Mediterranean diet scores applied to large population studies show that diets more consistent with traditional Mediterranean-style eating are linked with lower levels of blood tests of inflammatory markers. The inflammation-fighting potential of these eating patterns seems associated with their rich use of fruits and vegetables and with extra-virgin olive oil, which is rich in polyphenol compounds.
Healthy Plant-Based Diet Index scoring, reflecting more healthy choices within a plant-based diet, applied to a large population study of U.S. women found that higher scores were associated with biomarkers showing less inflammation. And when plant-based diets became less healthy over a decade of follow-up, biomarkers of inflammation rose. This scoring supplies important insights, clarifying that simply being plant-based does not automatically mean a diet is healthy.

Differences between scoring systems are important in choosing a tool for a research study. But for identifying the kinds of food choices that are most likely to have anti-inflammatory influence, they provide very similar answers.
Implications for Your Food Choices

Combining results of research using all these scoring systems, for a diet most likely to be anti-inflammatory:

- Focus on abundance and variety of vegetables and fruits, including deep orange and dark green choices, cruciferous vegetables (like broccoli and cauliflower), onion/garlic family choices, berries and citrus fruits.
- Choose mainly whole grains, keep enriched “staple” type refined grains like white bread and rice to modest amounts and limit sweet grain products (like cookies and cake) to occasional treats only.
- Expand your use of plant-based protein sources like pulses (such as, dried beans and lentils), soy foods, nuts and seeds. Limit red meat and processed meat.
- In addition to water, enjoy coffee and tea as beverages of choice rather than sugar-sweetened soft drinks, lemonade and sweetened juice “cocktails.”
- Enjoy delicious food that’s flavored with herbs and spices and prepared with extra-virgin olive oil and other unsaturated plant oils, rather than ultra-processed foods’ reliance on loads of

added sugars, unhealthy fats and salt for flavor.

Is an Anti-Inflammatory Diet an Anti-Cancer Diet?

Inflammation is identified in the AICR Third Expert Report as one of the key "enabling characteristics" that contribute to cells acquiring hallmarks of cancer. In contrast to short-term inflammation that's essential for wound-healing and recovery from infections, chronic low-grade inflammation contributes to all stages of cancer development.

Inflammation leads to the production of free radicals that damage DNA, potentially creating cancer-causing mutations.
Signaling by cytokine proteins produced by inflammatory cells seem to dial up expression of oncogenes (which increase cancer cell growth) and dial down tumor suppressor genes.
Inflammation may also be involved in cancer metastasis and in resistance to treatment, based on emerging research.

Recognizing the potential importance of inflammation—and a diet that reduces inflammation—in cancer, AICR funding provided some of the support for research on anti-inflammatory diets and cancer.

→ One analysis combining 44 observational studies found that each unit increase in the DII score (a more inflammatory diet) was associated with an 8.3% increase in overall cancer risk.

→ So far, the strongest association relates to risk of colorectal cancer. For each unit increase in the DII score (a more inflammatory diet), the risk of colorectal cancer increased 6 to 7 percent in analyses that combined multiple studies.

→ An anti-inflammatory diet also shows potential association with risk of several other cancers, including prostate, lung, breast, ovarian and others. So far, studies involving these cancers are limited in number, and many are a type of study that can be particularly vulnerable to other factors affecting results.

However, while results of many types of research suggest that an anti-inflammatory diet is likely an anti-cancer diet, reducing cancer risk involves more than an anti-inflammatory diet.

- Plant foods rich in phytochemicals may work in other cancer-preventive pathways like carcinogen deactivation, cell signaling and destruction of abnormal cells.
- A diet to reduce cancer risk should help you reach and maintain a healthy weight. Excess body fat not only affects cancer risk by promoting inflammation, it also affects levels of insulin and related growth factors and hormone levels tied to cancer risk.
- Physical activity as a part of everyday life goes hand-in-hand with eating habits, reducing cancer risk through many pathways.

Five Top Take-Aways for Today

1. An anti-inflammatory diet holds strong potential to reduce cancer risk.
2. Reducing cancer risk encompasses more than reducing inflammation. For example, alcohol is categorized in some scores as anti-inflammatory. However, alcohol is metabolized to a compound that is a known human carcinogen. And even low levels of alcohol consumption pose some risk of cancer. Researchers suggest this may explain some of the mixed findings relating anti-inflammatory diet scores and risk of breast cancer, one of the cancers that is particularly alcohol-related.
3. An anti-inflammatory diet is built based on the overall pattern of food choices you make. There's no need to jump back and forth based on hype about loading up on or avoiding any single food or nutrient.
4. An anti-inflammatory diet is not all-or-nothing. Analyses show that perfection is not needed, and each step closer to more anti-inflammatory choices may help lower risk of cancer.
5. The association of an anti-inflammatory diet with lower cancer risk provides an example of how you can reduce risk of both heart disease and cancer. Diet scoring systems link a more anti-inflammatory diet with lower levels of heart disease risk factors and risk of heart disease. And an anti-inflammatory diet is compatible with the AICR Recommendations that are based on today's best evidence on eating to lower cancer risk.

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