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The Role of Major Nutrients in Cancer Prevention [1]

This section has been reviewed and approved by the [Cancer.Net Editorial Board](#) [2], 03/2014

Key Messages:

- Calories come in the form of macronutrients including fat, carbohydrate, and protein. Most foods provide a mixture of macronutrients.
- Clinical trials and other association studies are examining whether the macronutrients people eat over time affect their cancer risk.
- Factors that contribute to energy balance, such as physical activity and diet, also play an important role in cancer prevention. Energy imbalance, or eating and drinking more than your body needs, is associated with either obesity or inadequate nutrition.

Finding the association between nutrients and cancer

Foods, including meat, dairy, grains, fruits and vegetables, fats, and legumes (beans) make up the main parts of your diet. The nutrients in foods that the human body turns into energy are called macronutrients. They include fat, carbohydrates, and protein. Alcohol is also considered a macronutrient, although you do not need it to survive.

Many foods and nutrients have long been studied for cancer prevention, but finding a specific link between a food or macronutrient and cancer is difficult. There are many challenges, including:

- Foods contain many components, macronutrients, micronutrients ([vitamins and minerals](#) [3]), and non-nutrients (phytonutrients from plants, such as beta carotene), that may contribute to cancer prevention.
- Most people eat and drink a variety of foods, creating interactions that are challenging to study.
- Sometimes, macronutrients have different effects on the body, depending on how much of the macronutrient you ate or drank and whether you are eating more or less than your body needs.
- Some research shows that food preparation may influence the risk or benefits of a food. For example, frying chicken in fat or making beans with lard adds additional fat and could influence your overall energy balance.

Foods and the cancer connection

Here is what is known about selected foods and macronutrients and their connection to cancer:

Fruits and vegetables. Fruits and vegetables probably protect against several cancers, including mouth, pharynx (part of throat), larynx (voice box), esophagus, stomach, lung, pancreas and prostate, according to the [American Institute of Cancer Research \(AICR\) and World Cancer Research Fund \(WCRF\)](#) [4]. The extent of the protection and how it works continue to be researched.

Dietary fiber. Fiber is a term for compounds from plants that are not digested by the body. It comes from the outer layer of grains and is found in fruits, vegetables, legumes, and nuts. Fiber helps add bulk to stool and move food more quickly through the digestive system. The AICR/WCRF study found that foods containing fiber, such as whole-grain bread and pasta, oats, legumes, vegetables, and fruits, are linked to a reduced risk of cancer, particularly colorectal cancer.

The Institute of Medicine (IOM) Food and Nutrition Board recommends that women age 50 and younger consume 25 grams (g) and men 50 and younger consumer 38 g of fiber each day. For people older than 50, the IOM recommends that women consume 21 g and men consume 30 g of fiber each day. This is equivalent to the fiber found in one serving of high fiber breakfast cereal (6 g to 10 g), 5 servings vegetables and fruit (15 g to 21 g), one serving whole grain bread (2 g to 3 g) and ½ cup beans (8 g to 10 g).

Protein. Meat, fish, shellfish, cheese, and eggs are the major sources of animal protein in most diets. Of those, red meat and processed meat are often studied as risk factors for cancer. Most of the studies suggest that people who eat more red meat have higher risk for developing colorectal cancer than those who eat less red meat, but avoiding processed meats is even more important. For example, the AICR/WCRF study found convincing evidence that eating processed meat, such as hot dogs, bacon, and salami, increases the chances of colorectal cancer. The study found people can eat up to 18 oz of red meat a week without raising cancer risk. Selecting lean cuts is important (such as flank steak or extra lean ground beef). Research on processed meat shows cancer risk starts to increase with any portion.

Dairy foods. Dairy foods are a varied food group and are usually a good source of calcium. Multiple studies of dairy foods and cancer have shown conflicting results. The AICR/WTCF study found that milk probably protects against colorectal cancer, and there is limited evidence that milk protects against bladder cancer. The study also found that the diets high in calcium are a possible cause of prostate cancer. Read more about [calcium, vitamin D, and cancer prevention](#) [5].

Alcohol. Alcohol increases the risk of several cancers. Learn more about [alcohol and cancer risk](#) [6].

Energy balance and cancer

Energy balance is eating and drinking about the same amount of calories the body needs to

function throughout the day and participate in any physical activity. It is the main way to maintain a healthy weight. Maintaining a healthy weight may be one of the most important ways to protect yourself against cancer. Learn more about [weight and cancer risk](#) [7] and [how physical activity can help you manage your weight](#) [8].

More Information

[Plant-Based Foods](#) [9]

[General Recommendations for Nutrition](#) [10]

Additional Resource

[American Institute for Cancer Research](#) [11]

Links:

[1] <http://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/diet-and-nutrition/role-major-nutrients-cancer-prevention>

[2] <http://www.cancer.net/about-us>

[3] <http://www.cancer.net/node/24987>

[4] <http://www.dietandcancerreport.org/>

[5] <http://www.cancer.net/node/24397>

[6] <http://www.cancer.net/node/24981>

[7] <http://www.cancer.net/node/25008>

[8] <http://www.cancer.net/node/24967>

[9] <http://www.cancer.net/node/24986>

[10] <http://www.cancer.net/node/24984>

[11] <http://www.aicr.org/>