The Role of Major Nutrients in Cancer Prevention

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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 [2] and diet also play an important role in cancer prevention, because energy imbalance is associated with either obesity or inadequate nutrition.

Finding the association with 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, that may (or may not) contribute to cancer prevention.
- Most people eat a variety of foods and drinks, creating interactions that are challenging to study.
- Sometimes, macronutrients have different effects on the body, depending on the amount of the macronutrient consumed and whether your body is in a state of excess, neutral or deficit for total energy balance.
- 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 a 2007 American Institute of Cancer Research (AICR) and World Cancer Research Fund (WCRF) report [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 helps 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, and 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 and men age 50 and younger consume 25 grams (g) and 38 g of fiber each day, respectively. Women and men over 50 should consume 21 g and 30 g of fiber each day, respectively. 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 Â½ cup beans (8 g to 10 g).

Protein. Meat, fish, shellfish, 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, also 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 probable cause of prostate cancer. Read more about calcium, vitamin D, and cancer prevention [3].

Alcohol. Alcohol [5] increases the risk of several cancers, including risk of cancer of the mouth, pharynx, larynx, esophagus, and breast, as well as colorectal cancer in men. Alcohol also probably increases colorectal and liver cancer risk in women.

Physical activity and weight control

Maintaining a healthy weight [6] may be one of the most important ways to protect yourself against cancer. More and more research is indicating that being overweight or obese (extremely overweight) increases the risk of several cancers. The AICR/WTCF study found convincing evidence that greater body fatness is a cause of colorectal cancer and cancer of the esophagus, endometrium, pancreas, kidney, and breast (in women who have been through menopause).

One way to avoid gaining weight is physical activity [2]. Studies also show that regular activity can keep hormone levels healthy, which is important because having high levels of some hormones can increase your cancer risk. There is convincing evidence that physical activity protects against colon cancer, and that it probably protects against postmenopausal breast cancer and endometrial cancer.

More Information

Plant-Based Foods [7]

General Recommendations for Nutrition [8]

Diet and Nutrition Resources [9]

Additional Resources

American Institute for Cancer Research [10]

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Links:
[1] http://www.cancer.net/about-us
[2] http://www.cancer.net/node/24967
[3] http://www.cancer.net/node/24987
[4] http://www.dietandcancerreport.org/
[5] http://www.cancer.net/node/24981
[6] http://www.cancer.net/node/25008
[7] http://www.cancer.net/node/24986
[8] http://www.cancer.net/node/24984
[9] http://www.cancer.net/node/24982
[10] http://www.aicr.org/