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**Diet, Exercise and Cancer**  
**The American Cancer Society Nutrition and Exercise Guide**  
**Part I: Nutrition and Cancer**  
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**Your Life your Health *The***  
***Examiner***  
**March 27, 2008**

The American Cancer Society has issued a nutritional and exercise guideline for preventing and living with cancer. The following information is taken from the ACS guide.

There is strong scientific evidence that healthful dietary patterns, in combination with regular physical activity, can reduce cancer risk. Approximately 35 percent of cancer deaths in the United States may be avoidable through dietary modification. The scientific study of nutrition and cancer is highly complex, and many important questions remain unanswered. It is not presently clear how the following elements of nutrition affect one's risk of specific cancers, such as:

- single nutrients
- combinations of nutrients
- over-nutrition
- energy imbalance
- the amount and distribution of body fat

However, epidemiological studies have shown that populations with the following dietary patterns have a reduced risk of some of the most common types of cancer:

- diets high in vegetables
- diets high in fruits
- diets low in animal fat
- diets low in meat
- diets low in calories

Until more is known about the specific components of diet that influence cancer risk, the best advice is to emphasize whole foods and certain broad dietary patterns, as described within these guidelines.

## **A summary of the guidelines**

Eat a variety of healthful foods, with an emphasis on plant sources.

- Eat five or more servings of a variety of vegetables and fruits each day.

- Include vegetables and fruits at every meal and for snacks.
- Eat a variety of vegetables and fruits.
- Limit French fries, snack chips, and other fried vegetable products.
- Choose 100% juice if you drink fruit or vegetable juices.

Choose whole grains in preference to processed (refined) grains and sugars.

- Choose whole grain rice, bread, pasta, and cereals.
- Limit consumption of refined carbohydrates, including pastries, sweetened cereals, soft drinks, and sugars.

Limit consumption of red meats, especially those high in fat and processed.

- Choose fish, poultry, or beans as an alternative to beef, pork, and lamb.
- When you eat meat, select lean cuts and have smaller portions.
- Prepare meat by baking, broiling, or poaching rather than by frying or charbroiling.

Choose foods that help you maintain a healthful weight.

- When you eat away from home, choose foods that are low in fat, calories, and sugar, and avoid large portion sizes.
- Eat smaller portions of high-calorie foods. Be aware that "low-fat" or "nonfat" does not mean "low-calorie," and that low-fat cakes, cookies, and similar foods are often high in calories.
- Substitute vegetables, fruits, and other low-calorie foods for calorie-dense foods such as French fries, cheeseburgers, pizza, ice cream, doughnuts, and other sweets.

### **Beneficial Effects of Vegetables and Fruits**

Greater consumption of vegetables, fruits, or both together has been associated in the majority of epidemiological studies with a lower risk of lung, oral, esophageal, stomach, and colon cancer. Evidence is less strong for cancers considered hormonal, such as breast and prostate.

Diet can be an important factor even in cancers caused, in large part, by other factors. For instance, many studies have found a lower risk of lung cancer among those who eat more vegetables and/or fruits in their diet. Although the major factor that causes lung cancer is tobacco smoking, diet also modifies risk, both in smokers and in lifelong nonsmokers.

Evidence that vegetable and fruit consumption reduces cancer risk has led to attempts to isolate specific nutrients and to administer these in pharmacological doses to high-risk

populations. Most of these attempts have been unsuccessful in preventing cancer or its precursor lesions, and in some cases, have had adverse effects. Notable examples are the three randomized trials of beta-carotene for the prevention of lung cancer, initiated because of many observational epidemiological studies indicating lower risk of lung cancer in persons eating foods high in beta-carotene. Two of the clinical trials showed that smokers taking high-dose beta-carotene supplements developed lung cancer at higher rates than those taking a placebo, while a third study showed no effect. These findings support the idea that beta-carotene may be only a proxy for other single nutrients or combinations of nutrients found in whole foods, and that taking a single nutrient in large amounts may be harmful.

It is presently unclear which components of vegetables and fruits are most protective against cancer. Vegetables and fruits are complex foods, each containing more than 100 potentially beneficial vitamins, minerals, fiber, and other substances that may help to prevent cancer.

Vegetables and fruits also contain specific phytochemicals, such as carotenoids, flavonoids, terpenes, sterols, indoles, and phenols that show benefit against certain cancers in experimental studies. There is ongoing research, for example, on the potential benefits of green and dark yellow vegetables, plants related to the cabbage family, soy products, legumes, allium (onion and garlic), and tomato products. Until more is known about specific food components, the best advice is to eat five or more servings of a variety of vegetables and fruits in their various forms: fresh, frozen, canned, dried, and juiced.

Despite recommendations from numerous health agencies to eat at least five servings of vegetables and fruits each day, intake of these foods remains low among adults and children. Concern about low-intake levels has led to a nationwide initiative—the National 5 A Day for Better Health program—to help insure that vegetables and fruits are available and accessible to all population groups, and to increase vegetable and fruit consumption to five or more servings per day.

## **Whole Grains**

Grains such as wheat, rice, oats, and barley, and the foods made from them, constitute the basis of a healthful diet. Whole grains are an important source of many vitamins and minerals that have been associated with lower risk of colon cancer, such as folate, vitamin E, and selenium. Whole grains are higher in fiber, certain vitamins, and minerals than processed (refined) flour products. Although the association between fiber and cancer risk is inconclusive, consumption of high-fiber foods is still recommended. Since the benefits grain foods impart may derive from their other nutrients as well as from fiber, it is best to obtain fiber from whole grains—and vegetables and fruits—rather than from fiber supplements. Standard portion sizes are quite small.

## **What Counts as a Serving?**

### Fruits

- 1 medium apple, banana, or orange

- 1/2 cup of chopped, cooked, or canned fruit
- 3/4 cup of 100% fruit juice

#### Vegetables

- 1 cup of raw, leafy vegetables
- 1/2 cup of other cooked or raw vegetables, chopped
- 3/4 cup of 100% vegetable juice

#### Grains

- 1 slice of bread
- 1 ounce of ready-to-eat cereal
- 1/2 cup of cooked cereal, rice, or pasta

#### Beans and nuts

- 1/2 cup of cooked dry beans
- 2 tablespoons of peanut butter
- 1/3 cup nuts Dairy

#### foods and eggs

- 1 cup of milk or yogurt
- 1 1/2 ounces of natural cheese
- 2 ounces of processed cheese
- 1 egg

#### Meats

- 2-3 ounces of cooked, lean meat, poultry, or fish

Beans are excellent sources of many vitamins and minerals, protein, and fiber. Beans are legumes, the technical term for the family of plants that includes dried beans, pinto beans, lentils, and soybeans, among many others. Beans are especially rich in nutrients that may protect against cancer and can be a useful low-fat, high-protein, alternative to meat.

#### **Dietary Fat and Consumption of Red Meat**

High-fat diets have been associated with an increase in the risk of cancers of the colon and rectum, prostate, and endometrium. The association between high-fat diets and breast cancer is much weaker. Research continues to examine whether the association between

high-fat diets and various cancers in some epidemiological studies is due to the total amount of fat, the particular type of fat (saturated, monounsaturated, or polyunsaturated), the calories contributed by fat, or some other factor associated with high-fat foods. Fats such as the saturated fat in red meats, omega-3 fatty acids in fish oils, or monounsaturated fats in olive oil, for example, likely differ in their effects on cancer risk. The relationship between specific types of fat and certain cancers is an important area of current research.

Because a gram of fat contains more than twice the calories of a gram of protein or carbohydrates (9 versus 4 kcal/gram), studies cannot easily distinguish the effects of fat itself from the effects of the calories it contains. In addition, dietary fat consumption is also correlated with greater consumption of meat and calories; lower consumption of vegetables, fruits, and grains; and higher body weight, so that it may be difficult to disentangle the separate contribution of fats to cancer risk.

Foods from animal sources remain major contributors of total fat, saturated fat, and cholesterol in the American diet. Although meats are good sources of high-quality protein and can supply many important vitamins and minerals, consumption of meat—especially red meats (beef, pork, lamb)—has been associated with cancers in many studies, most notably those of the colon and prostate. How much of this association is due to specific constituents within meat (such as saturated fats) or to correlated dietary factors is presently unclear. For example, mutagenic compounds, such as heterocyclic amines, are produced when protein is cooked at a high temperature, and may contribute to the association between meat and colon cancer.

Much evidence indicates that saturated fat may be particularly important in increasing risk of cancer as well as for heart disease. The best way to reduce saturated fat intake is to make wise choices in the selection and preparation of animal-based foods. Choose lean meats and lower-fat dairy products, and substitute vegetable oils for butter or lard. Food labels can be a useful guide to choosing packaged foods lower in saturated fat. Choose smaller portions and use meat as a side dish rather than as the focus of a meal. Emphasize beans, grains, and vegetables in meals to help shift dietary patterns to include more foods from plant rather than animal sources. Preparation methods are also important. Baking and broiling meat, rather than frying, reduces its overall fat content. Meat should be cooked thoroughly to destroy harmful bacteria and parasites, but should not be charred.

### **Choosing Foods that Help Maintain a Healthful Body Weight**

Most people cannot maintain a healthful body weight without limiting caloric intake while maintaining regular physical activity. Current trends indicate that the largest percentage of calories in the American diet comes from foods high in fat, sugar, and refined carbohydrates. Consuming a varied diet that emphasizes plant-based foods may help to displace these calorie-dense foods. Limiting portion sizes, especially of these types of foods, is another important strategy to reduce total caloric intake.

Replacing dietary fat with foods that are high in calories from sugar and other refined carbohydrates does not protect against obesity. The decrease in fat intake and increase in

consumption of refined carbohydrates that occurred in the United States between 1977 and 1995 coincided with an 8% increase in the prevalence of obesity. Excessive intake of sugar and other highly-refined carbohydrates may contribute to insulin insensitivity, alterations in the amount and distribution of body fat, and increased concentrations of growth factors that may promote the growth of cancers.

**If you drink alcoholic beverages, limit consumption.**

People who drink alcohol should limit their intake to no more than two drinks per day for men and one drink a day for women. The recommended limit is lower for women because of their smaller body size and slower metabolism of alcohol. A drink of alcohol is defined as 12 ounces of beer, five ounces of wine, or 1.5 ounces of 80-proof distilled spirits.

Alcohol consumption is an established cause of cancers of the mouth, pharynx, larynx, esophagus, liver, and breast. Alcohol consumption may also be related to increased risk of colon cancer. For each of these cancers, risk increases substantially with intake of more than two drinks per day. Alcohol consumption combined with tobacco increases the risk of cancers of the mouth, larynx, and esophagus far more than the independent effect of either drinking or smoking. Furthermore, regular consumption of even a few drinks per week has been associated with an increased risk of breast cancer in women. The mechanism by which alcohol is related to breast cancer is not known with certainty, but may be due to alcohol-induced increases in circulating estrogens or other hormones in the blood, reduction of folic acid levels, or to a direct effect of alcohol or its metabolites on breast tissue.

Reducing alcohol consumption may be an important way for many women to reduce their risk of breast cancer. Some studies suggest that consuming the recommended amount of the vitamin folic acid can minimize the increased risk of breast cancer from alcohol, but this relationship has not been firmly established.

Complicating the recommendation for alcohol and cancer risk reduction is the evidence that even moderate intake of alcoholic beverages appears to decrease the risk of coronary heart disease in both men and women. Even though alcohol can reduce the risk of coronary heart disease in women, those women who are at high risk of breast cancer might reasonably consider abstaining from alcohol. Public health officials advise people who already drink alcoholic beverages to limit their intake to two drinks a day for men and one drink per day for women. There is no compelling reason for adults who currently do not consume alcoholic beverages to start consuming alcohol to reduce their risk for heart disease, as cardiovascular risk can be reduced by not smoking, consuming a low- saturated fat diet, avoiding obesity, staying physically active on a regular basis, and controlling blood pressure.

Some groups of people should not drink alcoholic beverages at all. These include children and adolescents; individuals of any age who cannot restrict their drinking to moderate levels; women who are or may become pregnant; individuals who plan to drive or operate machinery or who take part in other activities that require attention, skill, or coordination; and individuals taking prescriptions or over-the-counter medications that can interact with alcohol.