

Nutrition and Cancer

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Cancer is a complex disease that appears in many forms. It is the second most common cause of death in the United States.

The number of cancer deaths has increased during the past 40 years. However, the cancer death rate (number per 100,000 people after adjustment for age) has stayed fairly constant for white Americans. In contrast, the rate has increased for non-whites.

Types of Cancer

Cancer is growth that is out of control. Much like weeds in a garden, cancer cells invade and take over body tissues.

Different forms of cancer can strike almost every part of the body. More than 100 types have now been identified. The lung, prostate, and colon and rectum are the most common cancer sites in males (see diagram). Cancer of the breast, colon and rectum, and uterus are most common forms in females.

In recent years, there have been changes in the types of cancer that occur most often. Cancer of the stomach is now less common among both males and females. This decrease may be linked to changes in food habits.

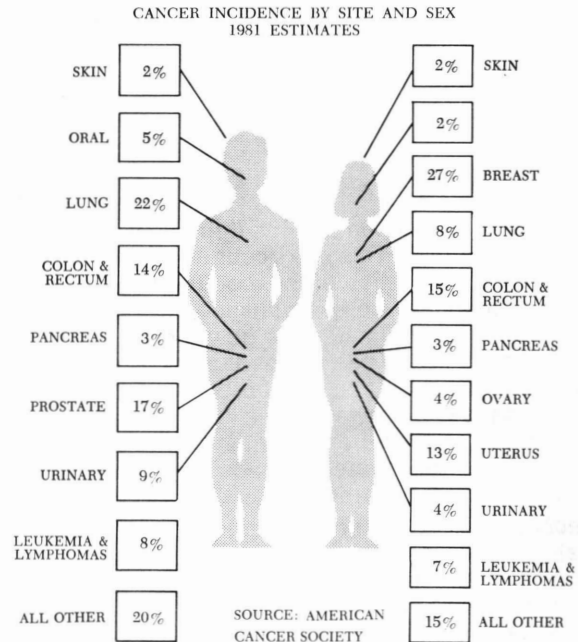
Lung cancer, on the other hand, has become more common as the rate of cigarette smoking has increased among women and younger males. A downward trend in the number of women smokers (identified in a 1980 National Health Interview Survey) will perhaps lead to a reduction in lung cancer cases.

Causes of Cancer

Cancer has numerous causes. About 20 percent of all cancers may be caused by factors that cannot be avoided: viruses, environmental radiation, genetic background. The remainder may be related to a variety of substances that enter our bodies through the air we breathe, the water we drink, and the food we eat. Smoking and excessive alcohol consumption are specific examples of known cancer risks. Some hazardous chemicals in our work places can also be absorbed through our skin.

The first dietary factor found to influence cancer incidence was excess calories which result in overweight. Further studies of certain groups of people indicate there may be more relationships between nutrition and cancer. For example, scientists discovered that Seventh-Day Adventists (living in the U.S.) and Japanese (living in Japan) had lower rates of breast and colon cancer than the general U.S. population. This finding was traced to their food intakes. A major difference is that their diets are lower in fat because of the food they choose to eat.

A study in rural Finland (where incidence of colon cancer is low) indicated that dietary fiber may have a



protective effect. Other studies have indicated that people who regularly include crucifers (brussels sprouts, cabbage, broccoli) in their diets have a lower rate of cancer.

Nutrition-Cancer Links

Our diets can affect the development of cancer both indirectly and directly.

Indirect effect

Too much or too little of certain nutrients may cause changes in our bodies that lead to cancer.

Breast cancer (the most common type in females) has been linked with consumption of large amounts of fat, a concentrated source of calories. Scientists throughout the world have found that diets high in fat may increase the risk of breast cancer. Amounts of certain sex hormones in the body may be higher when a high fat diet is eaten. This change may be related to cancer development.

Colon cancer (a common type in both males and females) has been linked with fat and fiber in the diet. Scientists have found that the diets of many colon cancer patients are low in fiber and high in fat. There may be changes in the intestinal bacteria when fiber is low. This



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may result in the formation of harmful substances that are related to cancer development.

Other types of cancer may also be related to dietary imbalances. Scientists are finding that excess weight increases the risk of cancer of the uterus. Also, smoking along with drinking too much alcohol is related to cancer of the mouth, throat, and esophagus. The incidence of stomach cancer is high in Japan, a country where dried and salted fish is common in the diet.

Direct effect

Cancer-causing substances may be present in our foods or beverages.

Aflatoxin is a toxin (poison) formed by a mold that can grow on grains and legumes (such as peanuts). This is a very strong cancer-causing substance in test animals. Peanut butter and other products which contain more than a specific amount of aflatoxin (set by federal regulation) cannot be sold.

Nitrosamines are compounds formed by reaction of nitrites with protein. (This can occur during food preparation or during digestion of the food in the body itself.) These compounds have been linked with the development of tumors in animals. The government limits the amount of nitrites that can be used to prevent growth of harmful bacteria in cured meats (such as bacon, hot dogs, and sausage). However, this is only one source of nitrites in our diets. Nitrates, which occur naturally in some vegetables and water supplies, are converted into nitrites in our digestive tracts.

Saccharin is an artificial sweetener used to flavor low-calorie foods including soft drinks. It has been linked with the development of bladder cancer in rats. Research indicates that heavy usage of saccharin may increase the risk of bladder cancer in humans.

Role of Diet

Diet is only one of several factors that may affect the development of cancer. Although diet alone cannot prevent cancer, it may have a role in reducing the risk. The National Cancer Institute suggests these dietary goals:

- Avoid excessive body weight by limiting calories and exercising regularly.
- Avoid high fat intake.
- Consume alcoholic beverages only in moderation.
- Eat a "generous" amount of fiber.

A diet which includes breads and cereals, fruits and vegetables; milk and milk products; and meat, dry beans and other legumes, or eggs, will provide the nutrients needed for good health. To decrease the risk of cancer, make appropriate selections from each food group.

It is important to keep the diet in balance. Excesses of any nutrient can harm the body. For example, too much fiber can reduce absorption of vitamins and minerals.

TO DECREASE FAT:

- ✓ Use less fat and oil, both added to foods and in cooking.
- ✓ Select foods lower in fat such as lean meat, poultry, fish, and skim milk.
- ✓ Trim visible fat from meat and skin from poultry.
- ✓ Roast meat and poultry (instead of frying).

TO INCREASE FIBER:

- ✓ Eat whole grain breads and cereals.
- ✓ Eat fruits and vegetables (both raw and cooked).

Dietary Fiber in Common Foods

Food group	Serving size	Dietary fiber* (grams)
Breads and cereals	½ cup bran cereal	7.5
	1 cup corn flakes	2.8
	1 slice whole wheat bread	2.1
	1 slice white bread	0.7
Fruits and vegetables	½ cup peas	5.8
	½ cup corn	4.8
	1 medium potato	3.4
	½ cup carrots	2.8
	1 small tomato	1.4
	1 medium pear (peeled)**	4.8
	1 medium banana	2.7
	1 medium peach	2.3
	1 medium apple (peeled)**	2.1
1 medium plum	0.8	
1 cup lettuce (shredded)	0.8	
Milk and milk products		No fiber
Meat and meat substitutes	Meat, poultry, fish	No fiber
	½ cup baked beans	7.3
	½ cup peanuts	6.6
	1 Tbsp. peanut butter	0.8

* At least 10 to 15 grams of fiber should be included each day.

** Although fruit peels are a good source of fiber, no data are available on the fiber content of unpeeled fruit.

Fat in Common Foods

Food group		Fat* (grams)
Breads and cereals	1 oatmeal cookie	
	with raisins (2½")	2.0
	1 cake doughnut (3¼")	7.8
	4 saltine crackers	1.0
	1 slice bread (white or whole wheat)	1.0
Fruits and vegetables	½ avocado	18.4
	10 french fries (3½-4")	10.3
	Other produce	Trace
Milk and milk products	1 cup milk	
	Whole	8.5
	Skim	0.2
	½ cup ice cream	7.0
	½ cup ice milk	3.0
	1" cube Cheddar cheese	5.5
	1 Tbsp. cream cheese	5.3
	½ cup cottage cheese	
	Creamed	4.4
	Uncreamed	0.2
1 Tbsp. sour cream	3.0	
1 Tbsp. half & half	1.8	
Meat and meat substitutes	3 oz. round steak (broiled)	
	Lean with fat	13.1
	Lean only	5.2
	3 oz. ham (roasted)	
	Lean with fat	26.0
	Lean only	8.5
	1 chicken breast (fried)	10.2
	3 oz. salmon (broiled)	6.3
	3 oz. tuna	
	Canned in oil (drained)	7.0
	Canned in water	0.7
	3 oz. crab meat (steamed)	1.6
	1 hot dog (cooked)	12.0
1 slice bacon (fried)	3.9	
1 Tbsp. peanut butter	8.1	
1 large egg (poached or hard-cooked)	6.5	
Fats and oils	1 Tbsp. margarine or butter	11.5
	1 Tbsp. mayonnaise	11.2

* Not more than 60 to 70 grams of fat should be included each day.