

***Circle Of Life<sup>SM</sup>: Cancer Education and Wellness for American Indian and Alaska Native Communities***

**Appendix B: Common Questions About Nutrition and Cancer**

*This section is taken from the American Cancer Society Complete Guide—Nutrition and Physical Activity for Cancer Prevention.*

**Alcohol**

**Does alcohol increase cancer risk?** Yes. Alcohol raises the risk of cancers of the mouth, pharynx (throat), larynx (voice box), esophagus, liver, breast, and the colon and rectum. People who drink alcohol should limit their intake to no more than 2 drinks per day for men and 1 drink per day for women. A drink is defined as 12 ounces of beer, 5 ounces of wine, or 1½ ounces of 80-proof distilled spirits (hard liquor). The combination of alcohol and tobacco increases the risk of some cancers far more than the effect of either drinking or smoking alone. Regular intake of even a few drinks per week is linked to a higher risk of breast cancer in women. Women at high risk of breast cancer may want to consider not drinking any alcohol.

**Doesn't wine have health benefits?** For some people, especially men older than 50 and women older than 60, the cardiovascular benefits of moderate drinking probably outweigh the risk of cancer. Talk to your health care provider about your risk factors for both heart disease and cancer, and make an informed decision about alcohol.

**Antioxidants**

**What are antioxidants, and what do they have to do with cancer?** The body uses certain compounds in foods and chemicals made in the body, called antioxidants, to help protect against damage to tissues that happens constantly as a result of normal metabolism (oxidation). Because such damage is linked with increased cancer risk, some antioxidants may help protect against cancer. Antioxidants include vitamin C, vitamin E, carotenoids (such as beta-carotene and vitamin A), and many other phytochemicals (chemicals from plants). Studies suggest that people who eat more vegetables and fruits, which are rich sources of antioxidants, may have a lower risk for some types of cancer. But this does not necessarily mean that it is the antioxidants that are responsible for this, as these foods also contain many other compounds.

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Several studies of antioxidant supplements have not found that they lower cancer risk. In fact, some studies have found an increased risk of cancer among those taking supplements. (See also entries for: beta-carotene, lycopene, vitamin E, supplements). To reduce cancer risk, the best advice at this time is to get your antioxidants through food sources rather than supplements.

### **Beta-carotene**

**Does beta-carotene reduce cancer risk?** Beta-carotene belongs to a group of antioxidants called carotenoids, which give some parts of plants (including vegetables and fruits) their deep orange color. In the body, beta-carotene is converted to vitamin A, which is thought to help prevent cancer. Because eating vegetables and fruits is linked with a reduced risk of cancer, it seemed to make sense that taking high doses of beta-carotene supplements might reduce cancer risk. But the results of several major studies show this is not the case. In 2 studies in which people were given high doses of beta-carotene supplements to try to prevent lung and other cancers in smokers, the supplements were found to increase the risk of lung cancer, and a third study found neither benefit nor harm from them. Eating vegetables and fruits that contain beta-carotene may be helpful, but high-dose beta-carotene supplements should be avoided, especially by smokers.

### **Calcium**

**Is calcium related to cancer?** Several studies have suggested that foods high in calcium might help reduce the risk of colorectal cancer, and calcium supplements modestly reduce the recurrence of colorectal polyps. But a high calcium intake, whether through supplements or food, has also been linked with an increased risk of prostate cancer.

In light of this, men should try to get – but not exceed – recommended levels of calcium, mainly through food sources. As women are not at risk of prostate cancer and are at a higher risk of osteoporosis (bone thinning), they should try to get recommended levels of calcium mainly through food sources. Recommended levels of calcium are 1000 mg/day for people ages 19 to 50 years and 1200 mg/day for people aged older than 50. Dairy products are excellent sources of calcium, as are some leafy vegetables and greens. People who get a lot of their

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calcium from dairy products should select low-fat or non-fat choices to reduce their intake of saturated fat.

### **Coffee**

**Does drinking coffee cause cancer?** No. The possible link between coffee and cancer of the pancreas, which got a lot of attention in the past, has not been confirmed by recent studies. At this time, there is no evidence that coffee or caffeine increases the risk of cancer.

### **Dietary supplements**

**Can dietary supplements lower cancer risk?** No, at least based on what we know at this time. A diet rich in vegetables, fruits, and other plant-based foods may reduce the risk of cancer, but there is little proof that dietary supplements can reduce cancer risk. One exception may be calcium supplements, which may reduce the risk of colorectal cancer (see the entry for calcium above). Some high-dose supplements may actually increase cancer risk.

Some dietary supplements may be beneficial for other reasons for some people, such as pregnant women, women of childbearing age, and people with restricted dietary intakes. If a person chooses to take a dietary supplement, the best choice is a balanced multivitamin/mineral supplement containing no more than 100% of the "daily value" of most nutrients.

Can I get the nutritional equivalent of vegetables and fruits in a pill? No. Many healthful compounds are found in vegetables and fruits, and these compounds most likely work together to produce their helpful effects. There are also likely to be important compounds in whole foods that are not yet known and therefore are not included in supplements. Some supplements are described as containing the nutritional equivalent of vegetables and fruits. But the small amount of dried powder in such pills often contains only a small fraction of the levels contained in the whole foods. Food is the best source of vitamins and minerals.

### **Fat**

**Will eating less fat lower cancer risk?** Some studies have found that people who live in countries with higher amounts of fat in their diet have higher rates of

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breast, prostate, colon, and other cancers. But more thorough studies have not found that fat intake increases cancer risk, or that lowering fat intake reduces cancer risk. At this time, there is not much proof that the total amount of fat a person eats affects cancer risk.

Understanding different types of fats:

Monounsaturated fats are mostly found in canola and olive oils. These fats probably don't affect cancer risk. They help decrease the risk of heart disease.

Polyunsaturated fats are liquid or soft at room temperature. They are found mainly in corn, sunflower, and safflower oils; margarine; and many types of seafood.

Omega-3 fatty acids are polyunsaturated and found mainly in seafood, especially high-fat fish – like salmon, tuna, and mackerel. These fats can help reduce heart disease risk.

Saturated fats are found in animal foods, like meat and dairy products, and in coconut, palm, and palm kernel oils. Saturated fats raise cholesterol levels and are linked to an increased risk of heart disease. They may influence cancer risk.

Trans fatty acids are formed when unsaturated fats are made more saturated to make them firmer at room temperature, such as in stick margarine. Trans fatty acids are also found in many processed snack foods, as well as in red meats, butter, and milk and should be limited. Their effect on cancer risk is unknown, but they are known to raise cholesterol levels and increase the risk of heart disease.

### **Fiber**

**What is dietary fiber, and can it lower cancer risk?** Dietary fiber includes a wide variety of plant carbohydrates that humans cannot digest. Good sources of fiber are dried beans, vegetables, whole grains, and fruits. Specific categories of fiber are "soluble" (such as oat bran, peas, beans, and psyllium fiber) or "insoluble" (such as wheat bran, fruit peels and skins, nuts, seeds, and cellulose).

Recent studies suggest dietary fiber is linked with a lower risk of some types of cancer, especially colorectal cancer. But it is not clear whether it is the fiber or

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another component of high-fiber foods that is responsible for the link. These findings are one of the reasons that the ACS recommends eating high-fiber foods such as whole grains, vegetables, and fruits to help reduce cancer risk, but does not expressly recommend the use of fiber supplements.

**“Wheat” bread and “whole-wheat” bread: What’s the difference?** Whole-wheat bread has more fiber and is better for you. If it just says “wheat bread,” the bread is probably made with refined white flour. Look for “whole grain” as the first ingredient on labels for bread, cereal, and crackers. Choose whole grains over processed (white) grains when possible.

### **Fish**

**Does eating fish protect against cancer?** Fish is a rich source of omega-3 fatty acids. Studies in animals have found that these fatty acids may stop cancer from forming or slow its growth, but it is not clear if they can affect cancer risk in humans.

Eating fish rich in omega-3 fatty acids is linked with a reduced risk of heart disease, but some types of fish (such as swordfish, tuna, tilefish, shark, and king mackerel) may contain high levels of mercury, polychlorinated biphenyls (PCBs), dioxins, and other pollutants. Some studies have also shown that farm-raised fish may carry more of these harmful substances than fish caught in the wild. Women who are pregnant, planning to become pregnant, or breast-feeding, and young children should not eat these fish, and should limit eating albacore tuna to no more than 6 ounces a week and canned light tuna to no more than 12 ounces a week. People should vary the types of fish they eat to reduce the chance of exposure to toxins.

### **Folate and folic acid**

**What are folate and folic acid, and can they lower cancer risk?** Folate is a B vitamin naturally found in many vegetables, beans, fruits, whole grains, and fortified breakfast cereals. Some studies from the 1990s suggested that a lack of folate might increase the risk of colorectal and breast cancers, especially in people who drink alcohol. But since 1998, enriched grain products in the United States have been fortified with folic acid, a manmade form of this vitamin, so most people get enough folate in their diet.

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Some studies suggest that folic acid supplements may increase the risk of prostate cancer, advanced colorectal polyps, and possibly breast cancer. Because of this, and the fact that most people get enough folate in their diet, the best way to get folate is by eating vegetables, fruits, and enriched or whole-grain products.

### **Garlic**

**Can garlic lower cancer risk?** Claims of the health benefits of the Allium compounds found in garlic and other vegetables in the onion family have been publicized widely. Garlic is now being studied to see if it can reduce cancer risk, and a few studies suggest that it may reduce the risk of colorectal cancer. Garlic and other foods in the onion family may be included in the variety of vegetables that are recommended for lowering cancer risk.

At this time there is not much evidence that Allium compound supplements can lower cancer risk.

### **Genetically modified foods**

**What are genetically modified foods, and are they safe?** Genetically modified or bioengineered foods are made by adding genes from other plants or organisms to increase a plant's resistance to insects; slow spoilage; or improve flavor, nutrient content, or other desired qualities. In recent years, there has been growing use of genetic engineering to produce certain foods. In the United States, for example, most soybeans and corn are grown from seeds that have been modified to resist herbicides, and in the case of corn, to make a natural insecticide.

Concerns have been raised about the safety of using genetically modified seeds. In theory, these added genes might create substances that could cause allergic reactions in some people, or could result in higher levels of compounds that cause health effects. On the other hand, genetic modification might also be used to improve public health. For example, there is interest in increasing the folate content of various plant foods through genetic modification.

There is no proof at this time that the genetically modified foods that are now on the market are harmful to human health or that they would either increase or decrease cancer risk because of the added genes. But the lack of proof of harm is not the same as proof of safety, and because these foods have been around for a

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fairly short time, the possible long-term health effects are not known. It is important that the safety of genetically modified foods continues to be assessed to be sure of their genuine safety as well as to increase confidence that their use is worthwhile.

Examples of genetically modified foods approved for sale in the United States include varieties of carrots, corn, tomatoes, and soy. The US Environmental Protection Agency (EPA), US Food and Drug Administration (FDA), and the US Department of Agriculture (USDA) all share oversight of these foods.

### **Irradiated foods**

**Do irradiated foods cause cancer?** There is no proof that irradiation of foods causes cancer or has harmful human health effects. Radiation is increasingly used to kill harmful germs on foods to extend their shelf life. Radiation does not stay in the foods after treatment, and eating irradiated foods does not appear to increase cancer risk.

### **Meat: Cooking and preserving**

**Should I avoid processed meats?** Some studies have linked eating large amounts of processed meat to increased risk of colorectal and stomach cancers. This link may be due in part to nitrites, which are added to many lunch meats, hams, and hot dogs to maintain color and to prevent bacterial growth. Eating processed meats and meats preserved using smoke or salt increases exposure to potential cancer-causing agents and should be reduced as much as possible.

**How does cooking meat affect cancer risk?** Adequate cooking is needed to kill harmful germs in meat. But some research suggests that frying, broiling, or grilling meats at very high temperatures forms chemicals (polycyclic aromatic hydrocarbons or heterocyclic aromatic amines) that might increase cancer risk. These chemicals can damage DNA and cause cancer in animals, but it is not clear how much they (as opposed to other substances in meat) may contribute to the increased colorectal cancer risk seen in people who eat large amounts of meat in some studies. Techniques such as braising, steaming, poaching, stewing, and microwaving meats produce fewer of these chemicals.

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When you eat meat, try to select lean cuts. Choose cuts of beef with “loin” or “round” on the label. Look for pork with “loin” or “round” in the name. Or, look for cuts that don’t have a lot of fat streaks (marbling) in them. Also, be sure to trim any visible fat you see – an easy way to drastically reduce the saturated fat!

### **Non-nutritive sweeteners and sugar substitutes**

**Do non-nutritive sweeteners or sugar substitutes cause cancer?** There is no proof that these sweeteners, at the levels consumed in human diets, cause cancer. Aspartame, saccharin, and sucralose are a few of the non-nutritive sweeteners approved for use by the FDA. Current evidence does not show a link between these compounds and increased cancer risk. Some animal studies have suggested that their use may be linked with an increased risk of cancers of the bladder and brain, or of leukemias and lymphomas, but studies in humans show no increased cancer risk. People with the genetic disorder phenylketonuria, however, should avoid aspartame in their diets.

Newer sugar substitutes include sweeteners such as sugar alcohols (sorbitol, xylitol, and mannitol) and naturally derived sweeteners (stevia and agave syrup). All of these sweeteners appear to be safe when used in moderation, although larger amounts of sugar alcohols may cause bloating and stomach discomfort in some people.

### **Obesity**

**Does being overweight increase cancer risk?** Yes. Being overweight or obese is linked with an increased risk of cancers of the breast (among women after menopause), colon and rectum, endometrium, esophagus, kidney, and pancreas, and probably cancer of the gallbladder as well. It may also be linked with increased risk of cancers of the liver, cervix, and ovary, as well as non-Hodgkin lymphoma, multiple myeloma, and aggressive forms of prostate cancer.

Research on whether losing weight reduces cancer risk is limited, but some research suggests that weight loss lowers the risk of breast cancer in women past menopause and possibly other cancers. Because of other proven health benefits, people who are overweight are encouraged to lose weight and keep it off.



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Avoiding excess weight gain as an adult is important not only in possibly lowering cancer risk but also in reducing the risk of other chronic diseases.

### **Olive oil**

**Does olive oil affect cancer risk?** Consuming olive oil is linked with a reduced risk of heart disease. It is most likely neutral with respect to cancer risk. Although olive oil, which is rich in monounsaturated fat, is a healthy alternative to butter and margarine, it is still a dense source of calories, and it can add to getting too many calories in the diet.

### **Organic foods**

**Are foods labeled "organic" more effective in lowering cancer risk?** The term "organic" is widely used to describe foods from plants grown without adding artificial chemicals, and foods from animals raised without hormones or antibiotics. Organic plant foods come from farming methods that do not use most conventional pest or weed killers, chemical fertilizers or sewage sludge as fertilizer, or food irradiation in processing. Foods that are genetically modified cannot be called organic.

While the purpose of organic food production is to promote sustainable farming practices, it is widely perceived that eating organic foods may carry health benefits. There is some debate over whether organic produce may have higher nutritional levels than conventionally grown produce. But at this time, there is no evidence that such foods are more effective in reducing cancer risk or providing other health benefits than similar foods produced by other farming methods.

### **Pesticides and herbicides**

**Do pesticides and herbicides in foods cause cancer?** Pesticides and herbicides can be toxic when used improperly in industrial, farming, or other workplace settings. Although vegetables and fruits sometimes contain low levels of these chemicals, overwhelming scientific evidence supports the overall health benefits and cancer-protective effects of eating vegetables and fruits. At this time there is no evidence that residues of pesticides and herbicides at the low doses found in foods increase the risk of cancer. Still, fruits and vegetables should be washed

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thoroughly before eating, not only to lower exposure to these compounds but also to limit the risk of health effects from germs.

### **Physical activity**

**Will increasing physical activity lower cancer risk?** Yes. People who get moderate to vigorous levels of physical activity are at a lower risk of developing several cancers, including those of the breast, colon, and endometrium (lining of the uterus), as well as advanced forms of prostate cancer. For some cancers, this risk is lowered whether or not the activity affects the person's weight.

Data for a direct effect on the risk of developing other cancers is more limited. Even so, physical activity is a key factor in reaching and staying at a healthy body weight, and being overweight or obese has been linked with many types of cancer. Physical activity is also helpful in lowering the risk of heart disease, diabetes, and other diseases.

### **Phytochemicals**

**What are phytochemicals, and do they reduce cancer risk?** The term "phytochemicals" refers to a wide variety of compounds made by plants. Some of these compounds protect plants against insects or have other important functions. Some have either antioxidant or hormone-like actions both in plants and in the people who eat them. Because consuming vegetables and fruits is linked with a reduced risk of cancer, researchers are looking for the specific compounds responsible for the helpful effects. But at this time, no evidence has shown that phytochemicals taken as supplements are as good for your long-term health as the vegetables, fruits, beans, and grains from which they are extracted.

Examples of phytochemicals include flavonoids (found in soy, chickpeas, and tea), carotenoids (found in butternut squash, cantaloupe, and carrots), anthocyanins (found in eggplant and red cabbage), and sulfides (found in garlic and onions).

### **Salt**

**Do high levels of salt in the diet increase cancer risk?** There is good evidence that diets that contain large amounts of foods preserved by salting and pickling carry an increased risk of stomach, nasopharyngeal, and throat cancer. Such foods

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generally are not a major part of the diets of most people in the United States, but lowering intake of salt-cured or pickled foods may help lower the risk of some cancers.

There is little evidence to suggest that the levels of salt used in cooking or flavoring foods or added to foods during processing in the United States affect cancer risk. But it is known to raise the risk of high blood pressure and heart disease, so the 2010 Dietary Guidelines for Americans and those of the American Heart Association recommend limiting salt intake.

### **Selenium**

**What is selenium, and can it reduce cancer risk?** Selenium is a mineral that helps the body's antioxidant defense mechanisms. Animal studies have suggested that selenium might protect against cancer. One study suggested that selenium supplements might reduce the risk of lung, colon, and prostate cancer in humans. But selenium supplements were not found to lower prostate cancer risk in a large clinical trial, and overall there is no good evidence that selenium supplements can lower cancer risk.

Selenium supplements are therefore not recommended, and high-dose selenium supplements should be avoided because there is only a narrow margin between safe and toxic doses. The maximum dose in a supplement should not exceed 200 micrograms per day.

### **Soy products**

**Can soy-based foods reduce cancer risk?** As with other beans or legumes, soy and foods derived from soy are an excellent source of protein and a good alternative to meat. Soy contains several phytochemicals, including isoflavones, which have weak estrogen-like activity and may help protect against hormone-dependent cancers. There is growing evidence that eating traditional soy foods such as tofu may lower the risk of cancers of the breast, prostate, or endometrium (lining of the uterus), and there is some evidence it may lower the risk of certain other cancers. Whether this applies to foods that contain soy protein isolates or textured vegetable protein derived from soy is not known.

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There is little data to support the use of supplements of isolated soy phytochemicals for reducing cancer risk.

### **Sugar**

**Does sugar increase cancer risk?** Sugar increases calorie intake without providing any of the nutrients that reduce cancer risk. By promoting obesity, a high sugar intake may indirectly increase cancer risk. White (refined) sugar is no different from brown (unrefined) sugar or honey with regard to their effects on body weight or insulin levels. Limiting foods such as cakes, candy, cookies, and sweetened cereals, as well as sugar-sweetened drinks such as soda and sports drinks can help reduce calorie intake.

### **Tea**

**Can drinking tea (black or green) reduce cancer risk?** Tea is a drink that results from infusion of the leaves, buds, or twigs of the tea plant (*Camellia sinensis*). Black, green, white, pu-erh, and other varieties of tea all come from the same plant, but reflect the different ways in which they are processed.

Some researchers have proposed that tea might protect against cancer because of its antioxidant, polyphenol, and flavonoid content. In animal studies, some teas (including green tea) have been shown to reduce cancer risk, but findings from studies looking at humans are mixed. The results of lab studies have been promising and tea drinking is a part of many cuisines, but evidence does not support the lowering of cancer risk as a central reason for drinking tea at this time.

### **Trans fats**

**Do trans fats increase cancer risk?** Trans fats are made when vegetable oils are hydrogenated to create oils such as margarine or shortening, which are solid at room temperature. Trans fats raise blood cholesterol levels and increase heart disease risk. But their relationship with cancer risk has not been determined.

Still, the 2010 Dietary Guidelines for Americans and those from the American Heart Association recommend limiting or avoiding trans fats, due to their effect on the risk of heart disease.

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### **Turmeric and other spices**

**Do turmeric and other spices reduce cancer risk?** Research is now under way looking at whether turmeric can affect cancer growth. Other spices also being studied for possible anti-cancer effects include capsaicin (red pepper), cumin, and curry. But studies in humans looking at the long-term effects of spices on diseases such as cancer are lacking at this time.

### **Vegetables and fruits**

**Will eating vegetables and fruits lower cancer risk?** Yes. The strength of the evidence that eating vegetables and fruits lowers cancer risk has weakened recently as more studies have found no or only weak effects, but the overall evidence suggests some lowering of risk for several types of cancer. This includes cancers of the lung, mouth, throat (pharynx), voice box (larynx), esophagus, stomach, colon, and rectum.

The types of vegetables and fruits that may reduce the risk of certain cancers may differ. It is not known which of the many compounds in vegetables and fruits are most likely to protect against cancer, and different vegetables and fruits may be rich sources of different phytochemicals that may lower cancer risk.

Recent studies suggest that eating more vegetables and fruits may also help lower the risk of developing obesity, and thus is likely to have an indirect effect on cancer risk. The best advice is to eat at least 2½ cups of a variety of colorful vegetables and fruits each day.

**Is there a difference in the nutritional value of fresh, frozen, and canned vegetables and fruits?** Yes, but they can all be good choices. Fresh foods are usually thought to have the most nutritional value (and often the best flavor as well). But frozen foods can actually be more nutritious than fresh foods because they are often picked ripe and quickly frozen (whereas fresh foods may lose some of their nutrients in the time between harvesting and eating).

Canning is more likely to reduce heat-sensitive and water-soluble nutrients because of the high heat that must be used. Be aware that some fruits are packed in heavy syrup, and some canned vegetables are high in sodium (salt). Choose vegetables and fruits in a variety of forms.

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**Does cooking affect the nutritional value of vegetables?** Boiling vegetables, especially for long periods, can remove their water-soluble vitamins. Some potentially beneficial phytochemicals are fat soluble, so sautéing in oil may increase the availability of these compounds. Cooking in general may break down plant cell walls and make nutrients and other phytochemicals more readily absorbed.

Microwaving and steaming are the best ways to preserve the nutritional content of vegetables. Eating raw vegetables, such as in salads, also preserves nutritional content. Along with the general recommendation to eat a wide variety of vegetables, using different cooking methods may also enhance the availability of many nutrients and phytochemicals.

Should I be juicing my vegetables and fruits? Juicing can add variety to the diet and can be a good way to get your vegetables and fruits, especially if chewing or swallowing is a problem. Juicing also helps the body absorb some of the nutrients in vegetables and fruits. But juices contain less fiber and may be less filling than whole vegetables and fruits. Fruit juice in particular can account for quite a few calories if a person drinks a lot of it. Commercially juiced products should be 100% vegetable or fruit juices. They should also be pasteurized to kill harmful germs.

### **Vegetarian diets**

**Do vegetarian diets reduce cancer risk?** Vegetarian diets can include many health-promoting features. They tend to be low in saturated fat and high in fiber, vitamins, and phytochemicals, and do not include eating red and processed meats. Thus, it is reasonable to suggest that vegetarian diets may be helpful in lowering cancer risk.

Whether vegetarian diets offer any special benefits against cancer over diets that include smaller amounts of animal products than are typically eaten in Western diets is less clear.

Strict vegetarian diets that avoid all animal products including milk and eggs, referred to as "vegan" diets, can benefit from supplementation with vitamin B12, zinc, and iron, especially for children and women before menopause. These diets should also include enough calcium, as people eating vegan diets with fairly low

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calcium content have been shown to have a higher risk of bone fractures compared with people eating vegetarian or meat-containing diets.

### **Vitamin A**

**Does vitamin A lower cancer risk?** Vitamin A (retinol) is obtained from foods in 2 ways: it can be taken in as vitamin A from animal food sources, or it can be made in the body from beta-carotene or other carotenoids in plant-based foods.

Vitamin A is needed to maintain healthy tissues.

Vitamin A supplements have not been shown to lower cancer risk, and high-dose supplements may, in fact, increase the risk for lung cancer in current and former smokers.

### **Vitamin C**

**Does vitamin C lower cancer risk?** Vitamin C is found in many vegetables and fruits, especially oranges, grapefruits, and peppers. Many studies have linked intake of foods rich in vitamin C to a lower risk of cancer. But the few studies in which vitamin C has been given as a supplement have not shown a reduced risk for cancer.

### **Vitamin D**

**Does vitamin D lower cancer risk?** Growing evidence from studies that observe large groups of people suggests that vitamin D may help prevent colorectal cancer, but so far the evidence does not support links to other cancers. Large studies are now under way, but the results will not be ready for several years.

The Institute of Medicine recently increased recommendations for the daily intake of vitamin D, based on levels required for bone health, from 400 to 600 international units (IU) for most adults, and to 800 IU per day for those aged 70 years and older. The upper daily limit of what is considered safe was increased from 2000 IU to 4000 IU.

Vitamin D is obtained through skin exposure to ultraviolet (UV) radiation; through diet, especially products fortified with vitamin D such as milk and cereals; and through supplements. But many Americans do not get enough vitamin D and are

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at risk of deficiency, especially people with dark skin, those with little sun exposure, the elderly, and exclusively breast-fed babies.

**Vitamin E**

**Does vitamin E lower cancer risk?** Alpha-tocopherol is the most active form of vitamin E in humans and is a powerful antioxidant. In one study, male smokers who took alpha-tocopherol had a lower risk of prostate cancer compared with those who took a placebo. This led to a large study (known as SELECT) that looked at the effects of selenium and vitamin E supplements on prostate cancer risk. But the study found that these supplements did not lower the risk of prostate cancer. If anything, the men taking vitamin E supplements may have had an increased risk.

Another large study (known as HOPE) looked at the risk of cancer and heart disease with vitamin E supplements compared with a placebo. No difference was seen in cancer rates or heart disease rates between the vitamin E supplement and placebo groups. Heart failure rates were actually higher among those taking vitamin E supplements.

Vitamin E supplements are not recommended to try to lower the risk of cancer or chronic diseases, although foods containing vitamin E, including nuts and some unsaturated oils, can be healthy and have been shown to lower the risk of heart disease.

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