HEALTHY EATING FOR LIFE

FOOD CHOICES FOR CANCER PREVENTION AND SURVIVAL

THE CANCER PROJECT

More than 1 million people are diagnosed with cancer in the United States each year, and there is an urgent need for a new direction in battling this disease. That's why physicians, researchers, nutritionists, and cancer specialists have joined together to form The Cancer Project.

The Cancer Project has two main goals. First, we aim to make cancer prevention a top priority. Second, and just as important, we want to improve survival after cancer has been diagnosed by offering comprehensive information about the role of dietary factors in keeping people healthy.

The Cancer Project provides classes, books, television and video programs, Web-based information at *www.cancerproject.org*, brochures, and other educational materials on cancer prevention and survival. The Cancer Project also conducts clinical research studies to investigate dietary issues and publicizes the need for cancer prevention in hard-hitting television messages spotlighting the value of healthy diet changes. Our hands-on nutrition classes, which help cancer survivors and their families learn new tastes and easy food preparation skills, have become incredibly popular. Through regular media interviews, our staff members provide important information to the public about cancer prevention.

Let me encourage you to support The Cancer Project. With your help, we'll make cancer prevention a priority and help people diagnosed with cancer have the tools they need. Through our detailed and user-friendly Web site (*www.CancerProject.org*), printed materials, television public service announcements, and hands-on services, we're able to spread a life-saving message far and wide. Since the Cancer Project is a non-profit 501(c)(3) organization, all contributions are tax-deductible to the full extent allowed by law.

Thank you for your interest and support.

Neal D. Barnard, M.D.

Physician, researcher, and author Neal D. Barnard is one of America's leading advocates for health, nutrition, and higher standards in research. Dr. Barnard is the founder and president of the Physicians Committee for Responsible Medicine. He also initiated The Cancer Project, an organization dedicated to cancer prevention, research, and nutritional assistance to cancer patients.

HEALTHY EATING FOR LIFE: FOOD CHOICES FOR CANCER PREVENTION AND SURVIVAL is published by The Cancer Project, 5100 Wisconsin Ave., NW, Suite 400, Washington, DC 20016, 202-244-5038, *www.CancerProject.org*.

HEALTHY EATING FOR LIFE is not intended as individual medical advice. Always discuss any diet change with your personal physician. In some cases, diet changes may alter your need for medication. Persons who follow a vegetarian diet should be sure to include a source of vitamin B_{12} in their daily routine, such as fortified cereals, fortified soymilk, or any common multiple vitamin.

FOOD CHOICES FOR CANCER PREVENTION AND SURVIVAL

Approximately 80 percent of cancers are due to factors that have been identified and can potentially be controlled, according to the National Cancer Institute. Not only do we have the potential to prevent most cancers, we can also improve the survival rates of people who have cancer.

Cancer starts when one cell begins to multiply out of control. It begins to expand into a lump that can invade healthy tissues and spread to other parts of the body. But this deadly disease can often be prevented, and when it occurs, it can often be stopped in its tracks.

At least one-third of annual cancer deaths in the United States are due to dietary factors.[1] A recent review of diet and cancer shows that much of our risk for colon, breast, and prostate cancer, among other types, is due to dietary factors.[2]

The link between diet and cancer is not new. In January of 1892, *Scientific American* printed the observation that "cancer is most frequent among those branches of the human race where carnivorous habits prevail." Numerous research studies have since shown that cancer is much more common in populations consuming diets rich in fatty foods, particularly meat, and much less common in countries with diets rich in grains, vegetables, and fruits. One reason is that foods affect the action of hormones in the body. They also affect the strength of the immune system. While fruits and vegetables contain a variety of vitamins, minerals, antioxidants, and phytochemicals that protect the body, research shows that, by contrast, animal products contain potentially carcinogenic compounds that may contribute to increased cancer risk.

Another 30 percent of cancers are caused by tobacco. Lung cancer is the most obvious example, but it is by no means the only one. Cancers of the mouth, throat, kidney, and bladder are also caused by tobacco. Other factors, including physical activity, reproductive and sexual behavior, bacterial and viral infections, and exposure to radiation and chemicals, may also contribute to the risk of certain forms of cancer.

BUILDING YOUR STRENGTH AGAINST CANCER

Some dietary changes have a preventive effect for many types of cancer. Boosting your intake of vitamin-rich vegetables and fruits, for example, strengthens your immune system and helps knock out cancer cells. To help prevent cancer, it is also smart to avoid meats, dairy products, and fried foods. Choosing fiber-rich legumes, grains, vegetables, and fruits helps keep many types of cancer at bay. Plant foods also contain a wide variety of cancer-fighting substances called phytochemicals.

Estimated Percentages of Cancer Due to Selected Factors[3,4]

Diet	35 to 60%
Tobacco	30%
Air and water pollution	5%
Alcohol	3%
Radiation	3%
Medications	2%

These facts all point to choosing a vegetarian diet to help prevent cancer and improve cancer survival. Studies of vegetarians show that death rates from cancer are only about one-half to three-quarters of those of the general population. Breast cancer rates are dramatically lower in countries such as China and Japan, where diets are typically based on rice, vegetables, and bean products, with very little use of meat, dairy products, or oily foods. When people from those countries adopt a Western, meat-based diet, their breast cancer rates soar.

Are you ready to start enjoying the powerful benefits of a vegetarian diet? See "The Three-Step Way to Go Vegetarian" on page 9.

DEFENDING YOUR DNA FROM HARM

Let's look at the steps we can take to build our general defenses. Oxygen is essential to life. But as oxygen is used in the body, some of the oxygen molecules become very unstable. These unstable molecules, called free radicals, can attack cell membranes and even damage the DNA (our genetic code) in the nucleus of the cell. Damage to DNA is the beginning of cancer.

Fortunately, the foods we eat can help protect our bodies. Antioxidants, including vitamin C, vitamin E, beta-carotene, selenium, lycopene, and others, can neutralize the damaging effects of oxygen. These powerful natural chemicals come to us in vegetables, fruits, grains, and beans. People who include fruits and vegetables in their daily diets have lower rates of many forms of cancer.

Smokers have provided dramatic demonstrations of the power of vegetables and fruits. A 55-year-old male smoker whose diet is low in vitamin C has a one-in-four risk of dying of lung cancer in the next 25 years. But if the smoker has a high intake of vitamin C, either through diet or supplements, his risk drops to 7 percent. Effects of antioxidants have even been seen in childhood. When children with brain tumors were studied, it was found that their mothers consumed less vitamin C during pregnancy, compared to other women.[5]

To step up the antioxidant power of your menus, try a baked sweet potato, Hoppin' John Salad, or baked corn chips with Tomato Corn Salsa (recipes on pages 11 and 12).

Even with vegetables and fruits in the diet, damage to the cells' DNA will occasionally occur, so the body has built-in repair machinery. Fixing DNA requires a B vitamin called folic acid, which is found in dark green leafy vegetables, fruits, peas, and beans. The Dietary Reference Intake for folic acid for adult women and men is 400 micrograms per day and increases to 600 micrograms per day for pregnant women. Beans and vegetables are rich in folic acid. Asparagus, black beans, black-eyed peas, chickpeas, lentils, pinto beans, and cooked spinach all have more than 200 micrograms in a one-cup serving.

We are all exposed to cancer-causing chemicals, despite our efforts to avoid them. Some people are smokers, and, of course, quitting smoking is a vital step for them. But all of us are exposed to chemicals in the air, water, food, and household products in addition to the carcinogens produced within our bodies as a part of our metabolic processes. While trying to minimize our exposure to carcinogens, we can also shore up our defenses against these assaults by including generous amounts of vegetables and fruits in our diet.

Antioxidants in Foods	Vit C (mg)	B-carotene (mg)	Vit E (mg)
Apple (1 medium)	8	0.04	0.44
Broccoli	116	1.30	1.32
Brown rice	0	0.00	4.00
Brussels sprouts	96	0.67	1.33
Carrot (1 medium)	7	12.00	0.28
Cauliflower	54	0.01	0.05
Chickpeas	2	0.02	0.57
Corn	10	0.22	0.15
Grapefruit (pink, 1/2)	47	0.19	0.31
Navy beans	2	0.00	4.10
Orange (1 medium)	75	0.16	0.31
Orange juice	124	0.30	0.22
Pineapple	24	0.02	0.16
Soybeans	3	0.01	3.35
Fresh spinach	16	2.30	0.57
Strawberries	84	0.02	0.23
Sweet potato (1 medium with skin)	28	15.00	0.32

Serving sizes are one cup (8 oz.), except as otherwise noted.

Sources: Pennington JAT. Bowes and Church's Food Values of Portions Commonly Used. New York, Lippincott, 1998. Messina M, Messina V. The Dietitian's Guide to Vegetarian Diets. Gaithersburg (MD), Aspen, 1996. USDA Nutrient Database for Standard Reference, Release 12, last updated April 7, 1999.

FOODS AND IMMUNITY

Even if we follow healthy lifestyles, cancer cells will arise in the body from time to time. Luckily, we have white blood cells that roam our bloodstreams looking for these troublemakers. Some white blood cells, called natural killer cells, seek out and destroy cancer cells and bacteria. They engulf and destroy aberrant cells before they can cause damage. The function of natural killer cells and other white blood cells is improved by as little as 30 milligrams of beta-carotene per day—the amount in two large carrots.

Although beta-carotene is safe, even in fairly substantial amounts, the best way to get beta-carotene is not in pills, but in carrots, winter squash, spinach, kale, and the other packages in which nature supplies it. Beta-carotene is only one of perhaps two dozen related substances called carotenoids that occur naturally in vegetables and fruits and have varying degrees of biological activity.

In addition to their antioxidant effects, vitamins C and E and selenium bolster immune function, but the importance of these effects in protecting against cancer is not yet clear.

Fats impair immunity, and cutting fat out of the diet helps strengthen the immune defenses against cells that turn cancerous. Researchers in New York tested the effect of low-fat diets on immunity.[6] They put healthy volunteers on a diet that limited fat content to 20 percent, reducing all fats and

Women who consumed more animal products had as much as three times the cancer risk of other women

oils—not just saturated or unsaturated fats. Three months later, the researchers took blood samples from the volunteers and examined their natural killer cells. The natural killer cell activity was greatly improved.

Although vegetable oils are far superior to animal fats for heart patients, when it comes to the immune system, vegetable oils are no better than animal fats. In experiments, researchers have found that when they infuse soybean oil intravenously into volunteers, the white blood cells no longer work as well.[7] Test-tube experiments show similar results.[8]

Similarly, omega3 fatty acids, which are found in fish oils, green vegetables, and soybean, flax seed, and canola oils, also compromise immune function. The bottom line on fats and oils: greatly reduce your intake of all of them.

It should come as no surprise that vegetarians have stronger immune systems than meat-eaters. Studies of white blood cell samples from vegetarians have shown them to have more than double the cancer cell–destroying ability of their non-vegetarian counterparts.[9] The immune-boosting power of vegetarian diets is partly due to their vitamin content, low fat content, and perhaps other contributors, such as reduced exposure to toxic chemicals and animal proteins.

FOODS AND HORMONES

Several of the most common forms of cancer are linked to sex hormones. This is true of cancers of the breast, uterus, ovary, prostate, and perhaps other sites. The amount of hormones in our bodies and their actions are determined, in large part, by the foods we eat.

BREAST CANCER: PREVENTION

As long ago as 1982, the National Research Council, in a report called Diet, Nutrition, and Cancer, showed the evidence already available linking specific dietary factors to cancer of the breast and other organs.

International comparisons offer a good illustration. Asian countries, such as Japan, have low rates of breast cancer, while Western countries have cancer rates many times higher. However, when Japanese girls are raised on Westernized diets, their rate of breast cancer increases dramatically.

The traditional Japanese diet is much lower in fat, especially animal fat, than the typical Western diet. In the late 1940s, when breast cancer was particularly rare in the that country, less than 10 percent of the calories in the Japanese diet came from fat. The American diet, of course, is centered on animal products, which tend to be high in fat and low in other important nutrients. The fat content of the average American diet is well above 30 percent of calories.

Countries with a higher intake of fat, especially animal fat, have a higher incidence of breast cancer. Even within Japan, affluent women who eat meat daily have an 8.5 times higher risk of breast cancer than poorer women who rarely or never eat meat. The 1988 Surgeon General's Report on Nutrition and Health states, "Indeed, a comparison of populations indicates that death rates for cancers of the breast, colon, and prostate are directly proportional to estimated dietary fat intakes."

FAT AND HORMONAL EFFECTS

Fatty foods have a strong influence on hormonal activity in the body. First, high-fat diets increase the amount of estrogens, the female sex hormones, in the blood. This is a problem, because it is well known that many breast tumors are "fueled" by estrogens. Estrogens are normal and essential hormones for both women and men, but the more estrogen present, the greater the driving force behind some kinds of breast cancer. On high-fat diets, estrogen levels increase. When women adopt low-fat diets, their estrogen levels drop noticeably in a very short time. Vegetarians have significantly lower estrogen levels than non-vegetarians, in part because of the lower fat content of their diet. In addition, they have more of certain carrier molecules, called sex hormone–binding globulin, that circulate in the blood and have the job of holding onto sex hormones, keeping them inactive until they are needed. Fatty foods do the reverse: they increase estrogens and reduce the amount of the carrier molecule that is supposed to keep estrogens in check.

Animal fats are apparently a bigger problem than vegetable oils. Paolo Toniolo of the New York University Cancer Institute compared the diets of 250 women with breast cancer to 499 women without cancer from the same province in northwestern Italy. The two groups ate about the same amount of olive oil and carbohydrates. What distinguished the cancer patients was that they had eaten more meat, cheese, butter, and milk. Women who consumed more animal products had as much as three times the cancer risk of other women.[10]

A 2003 Harvard University study that included

more than 90,000 women showed that the women who had eaten the most animal fat had significantly higher risk of breast cancer compared with women who ate the least.[11]

Even though cross-cultural comparisons have pointed a finger at animal fat as the principal problem, vegetable oil is also under some suspicion. Vegetable oils can probably affect estrogen levels and, as we will see, can increase the production of cancer-causing free radicals. So it is no good just replacing fried chicken with fried onion rings. The best diet eliminates animal products and keeps vegetable oils to a minimum as well.

Certain foods have special benefits. Soybeans, for example, contain natural compounds called phytoestrogens. These are very weak estrogens that can occupy the estrogen receptors on breast cells, displacing normal estrogens. The result is less estrogen stimulation of each cell. Soybeans are a mainstay of Asian diets and may be an additional reason why these countries have low cancer rates.

HOW MUCH FAT IS TOO MUCH?

The National Cancer Institute has long recommended that fat be limited to less than 30 percent of calories and that the fattiest meats be replaced by leaner meat, poultry, fish, and vegetables. These recommendations, however, are much too weak to prevent cancer or to increase survival for those already diagnosed with the disease. A large study of American nurses showed that those who limited fat to 27 percent of their calories were not any better off in preventing cancer than those consuming more fat.[12] Some have interpreted this to mean that diet has nothing to do with breast cancer. A more reasonable conclusion is that the diets these women followed were still high-risk diets. After all, a diet including regular consumption of animal products and drawing nearly 30 percent of calories from fat is nothing like the traditional plant-based Asian diets associated with low cancer risk.

Favoring Fiber

Grains, vegetables, fruits, and legumes ensure plenty of fiber, but chicken breasts, beef, pork, eggs, cheese, and all other animal products contain no fiber at all.

Getting the fat off your plate is important—but that is just the first step. Other food choices play important roles in cancer prevention. Vegetables, fruits, grains, and beans provide fiber, which helps the body dispose of excess estrogen.

One way the body rids itself of sex hormones is through the digestive tract. The liver pulls sex hormones from the blood, chemically alters them, and sends them down the bile ducts into the intestinal tract. There, the fiber from grains, vegetables, fruits, and beans ushers sex hormones through the intestine and out the door as wastes. At least, that is how the system is supposed to work. But chicken breasts, beef, eggs, cheese, and all other animal products contain no fiber at all. As these products have taken up more and more space on the American plate, they have displaced grains, vegetables, beans, and fruits. Without adequate fiber to hold them in the digestive tract, sex hormones are reabsorbed into the bloodstream, where they once again become biologically active. The hormones your body was trying to eliminate are thus put back into circulation.

Building your diet from grains, vegetables, fruits, and legumes ensures plenty of fiber for the body's needs. To increase your daily fiber intake, start your day with oatmeal and fruit, and try adding delicious, low-fat, fiber-rich recipes such as Lentil Barley Stew or Quick Bean Burritos to your weekly menu (see recipes on page 12).

CARCINOGENIC COMPOUNDS IN COOKED MEAT

Not only is meat devoid of fiber and other nutrients that have a protective effect, but it also contains animal protein, saturated fat, and, in some cases, carcinogenic compounds formed during the process of cooking meat. These carcinogenic compounds may be to blame for part of the correlation between meat intake and increased cancer risk. Meat intake has been shown to be a risk factor for breast cancer even when researchers controlled for confounding factors such as total fat and calorie intake.[13]

Heterocyclic Amines

Heterocyclic amines (HCAs) are DNA-damaging compounds that are produced as meat cooks. Grilling, frying, or oven-broiling meat produces large quantities of these mutagens. The longer and hotter the meat is cooked, the more of these compounds form. In some studies, grilled chicken formed higher concentrations of these cancer-causing substances than other types of cooked meat.[14]

The major classes of HCAs are formed from creatine or creatinine, specific amino acids, and sugars. All meats, including fish, are high in creatine. HCA formation is greatest when meat is cooked at

Vegetables, fruits, grains, and beans provide fiber, which helps the body dispose of excess estrogen.

high temperatures, as is most common with grilling or frying. Consumption of well-done meat has been associated with increased risk of breast cancer and colon cancer.

Polycyclic Aromatic Hydrocarbons

Grilling or broiling meat over a direct flame results in fat dropping on the hot fire and the production of flames containing polycyclic aromatic hydrocarbon (PAH). PAHs adhere to the surface of food; the more intense the heat, the more PAHs are present. They are believed to play a significant role in contributing to human cancers. A fairly consistent association between grilled or broiled, but not fried, meat consumption and stomach cancer implies that dietary exposure to PAHs may play a role in the development of stomach cancer in humans.

OTHER FACTORS

Aside from diet, other factors increase breast cancer risk, including the following:

Hormones: Supplemental hormones given to women after menopause increase breast cancer risk. Oral contraceptives may also increase risk slightly. Although newer birth-control pills contain less estrogen and progesterone than older versions, evidence suggests some increase in risk.

Overweight: Higher body weight increases the risk of breast cancer after menopause.

Radiation: Of all the different parts of the body, the breast is probably the most sensitive to X-ray damage, and there is no doubt that X-rays to the breast can cause cancer.

This raises obvious concerns about mammograms, which, after all, are X-rays. Annual mammograms are clearly beneficial for women over 50. But women should schedule mammograms only at modern facilities that do them regularly and maintain new equipment, which keeps radiation doses to a minimum. For women under 50, it is unclear whether routine mammograms are beneficial. Many cancers are missed on mammograms, and women have sometimes been falsely reassured by a negative mammogram, leading to delays in diagnosis and treatment. All women (especially those under 50) should do regular self-exams and follow their physicians' recommendations regarding mammogram screening.

Genetics: About 5 percent of breast cancer cases are purely attributable to genetics. In such cases, cancer is passed from parent to child as a dominant trait, and the family tree is riddled with the disease. For a larger group of individuals, genetics probably makes a contribution in subtle ways. For example, it may well be that different genes influence one's susceptibility to carcinogens, the strength of the immune system, body weight, and other factors. Each of these is also influenced by diet.

Toxic Chemicals: Populations in areas near toxic waste sites tend to have higher than average rates of breast cancer. That is true for other forms of cancer, too. And you don't have to live near a chemical waste site to be concerned about toxic exposures. Toxic chemicals are available at any grocery store. Chemical contaminants frequently end up in meats and dairy products, because pesticides are sprayed on grains fed to cows, chickens, pigs, and other livestock. In storage bins, feed grains are sprayed again. Animals concentrate these chemicals in their tissues. Traces of pesticides can also be found on non-organic produce. Fortunately, organic produce is now more widely available.

Women who avoid eating animal products have much lower concentrations of pesticides in their breast milk. Pesticides such as DDT, chlordane, hepatochlor, and dieldrin, and polychlorinated biphenyls (PCBs) have been measured at markedly lower levels in vegetarians than in omnivores. In a 1981 study, vegetarians had only 1 to 2 percent of the national average levels of certain pesticides and industrial chemicals compared to levels in average Americans.[15] The exception was polychlorinated biphenyls (PCBs), for which vegetarians had levels comparable to meat-eaters. PCBs in the body often reflect past fish consumption, and levels drop slowly after people adopt a vegetarian diet. Once PCBs are in the body tissues, avoiding contaminated fish will reduce PCB levels only very slowly.

Time between Puberty and First Pregnancy: The younger a girl is when puberty occurs, the higher her risk of breast cancer. Also, the later the age of her first pregnancy, the higher her risk. However, it may be that the early age of puberty simply indicates elevated hormone levels, as described above. As high-fat, low-fiber diets have spread from the wealthy to most of the population, the age of puberty has dropped dramatically from 17 in 1840 to 12.5 today. Similarly, as Japan's diet has Westernized since World War II, the age of puberty has dropped from 15 to 12.5. It may be that early puberty and cancer are both the result of a hormonal aberration.

CANCERS OF THE UTERUS AND OVARY: PREVENTION

The uterus and ovary, of course, are reproductive organs, and factors that affect hormone function can be expected to affect these organs as well. The risk of cancer of the uterus and ovary is higher in populations that have more breast cancer incidences, suggesting that they may be caused by similar factors. Uterine cancer is linked to fatty diets and obesity, although other factors, including hormone supplements, also play an important role. Ovarian cancer is also more common where people eat high-fat diets.

Some researchers have suggested that a higher intake of dairy products may be linked to ovarian cancer. If this finding holds true, the culprit may be a product of the breakdown of the milk sugar lactose. Lactose breaks down in the body to form another sugar called galactose, which appears to be able to damage the ovary. The problem is the milk sugar, not the milk fat, so it is not solved by using non-fat products. Further research in this area is needed.

PROSTATE CANCER: PREVENTION

Like women, men on high-fat Western diets have more estrogens circulating in their blood and a higher risk of cancer of reproductive organs. High-fat diets alter the amounts of testosterone, estrogen, and other hormones in both men and women.

The prostate gland, located just below the bladder in men, produces semen to be mixed with sperm cells. Cancer of the prostate, which occurs primarily in older individuals, is the most common form of cancer in American men.

Cancer cells are found in the prostates of about 20 percent of men over 45 years old. In most cases, these cancer cells do not develop into cancerous tumors that affect the overall health or life span of the individual. However, in some cases, the cancer does grow, invade surrounding tissues, and spread to other parts of the body. Although the disease varies greatly from one person to the next, the average patient loses nine years from his normal life span. One in 10 men will develop prostate cancer at some point in his life.

Asian and Latin American countries have a much lower prevalence of prostate cancer, but the disease is very common in Europe and North America. Ten men die of prostate cancer in Western Europe for every one who dies of the disease in Asia.

Cancer of the prostate is strongly linked to what men eat. Again, animal products are consistently indicted: Milk, meat, eggs, cheese, cream, butter, and fats are found, in one research study after another, to be linked to prostate cancer.[16–25] And it is not just dairy products and meats. Some studies have also pointed a finger at vegetable oils.[17,26] More recently, milk consumption has been linked to prostate cancer due to high levels of the compound insulin-like growth factor (IGF-I), which is found both in dairy products and in increased levels in the bodies of those who consume dairy on a regular basis. A Harvard University study showed that men who had the highest levels of IGF-I had more than four times the risk of prostate cancer compared with those who had the lowest levels.[27] In addition, two major Harvard studies have shown that milk-drinking men have 30 to 60 percent greater prostate cancer risk than men who generally avoid dairy products.[28,29]

Who has a lower risk? Countries with more rice, soybean products, or green or yellow vegetables in the diet have far fewer prostate cancer deaths. Diets rich in lycopene, the bright red pigment found in tomatoes, watermelon, and pink grapefruit, have also been shown to prevent prostate cancer. A study at Harvard University showed that men who had just two servings of tomato sauce per week had a 23 percent lower risk of prostate cancer, compared with those who rarely ate tomato products.[30] It is not surprising that vegetarians have low rates of prostate cancer. Becoming a vegetarian in adulthood is helpful, but men raised as vegetarians have the lowest risk.

Men who consume diets based on animal products tend to have higher levels of testosterone compared with men who eat plant-based diets. This increase may be due to overproduction of these hormones in the body. Also, fiber in the diet helps remove excess hormones with body wastes. Those who eat meats and dairy products miss out on a substantial amount of fiber, because animal products have no fiber at all. This hormonal boost can affect the prostate, which is the likely reason for increased cancer risk among men on meat-based diets.

COLON CANCER: PREVENTION

The colon is another name for the large intestine, which makes up the second half of our digestive tract. Strong links have been found between colon cancer and the consumption of meats and other fatty foods.

To absorb the fats we eat, our liver makes bile and stores it in the gallbladder. After a meal, the gallbladder squirts bile acids into the intestine, where the acids chemically modify the fats so they can be absorbed. Unfortunately, bacteria in the intestine turn these bile acids into cancer-promoting substances called secondary bile acids. Meats contain a substantial amount of fat, and they also foster the growth of bacteria that cause carcinogenic secondary bile acids to form. When meat is cooked, carcinogens can form on the surface of the food. As with breast cancer, frequent consumption of meat—particularly red meat—is associated with an increased risk of colon cancer.

High-fiber diets offer a measure of protection. Fiber greatly speeds the passage of food through the colon, effectively removing carcinogens. And fiber actually changes the type of bacteria present in the intestine, which reduces production of carcinogenic secondary bile acids. Fiber also absorbs and dilutes bile acids.

Even people at particular risk for cancer can be helped by high-fiber diets. Jerome J. DeCosse, M.D., a surgeon at Cornell Medical Center, gave bran to patients with recurrent polyps of the colon. These are small growths that have a tendency to become cancerous. Dr. DeCosse found that, within six months, the polyps became smaller and fewer in number. He believes that pentose fiber, which is plentiful in wheat, is the key to bran's power.[31]

Strong links have been found between colon cancer and the consumption of meats and other fatty foods.

Vegetables, particularly cruciferous ones such as broccoli, cauliflower, Brussels sprouts, and cabbage, also lower the risk of colon cancer.

VEGETARIAN FOODS: POWERFUL FOR HEALTH

Two themes consistently emerge from cancer research: Vegetables and fruits help reduce risk, while animal products and other fatty foods are frequently found to increase risk.

When the terms "fiber" and "fat" are used, it is easy to forget the foods from which they come. When you hear about the dangers of fat, think meat- and- dairy-based diets, aided and abetted by oily foods. Fiber is found in whole grains, vegetables, fruits, and beans. There is no fiber in any product from an animal.

A vegetarian menu is a powerful and pleasurable way to achieve good health. The vegetarian eating pattern is based on a wide variety of foods that are satisfying, delicious, and healthful. Are you ready to get started?

TRY THE NEW FOUR FOOD GROUPS AND DISCOVER A HEALTHIER WAY TO LIVE!

Vegetables (4 or more servings a day)

Vegetables are packed with nutrients, including vitamin C, beta-carotene, riboflavin, iron, calcium, fiber, and other nutrients. Dark-green leafy vegetables, such as broccoli, collards, kale, mustard and turnip greens, chicory, and bok choy, are especially good sources of these important nutrients. Dark-yellow and orange vegetables such as carrots, winter squash, sweet potatoes, and pumpkin provide extra beta-carotene. Include generous portions of a variety of vegetables in your diet.

Serving size: 1 cup raw vegetables • 1/2 cup cooked vegetables

Whole Grains (5 or more servings a day)

This group includes bread, rice, pasta, hot or cold cereal, corn, millet, barley, bulgur, buckwheat groats, and tortillas. Build each of your meals around a hearty grain dish. Grains are rich in fiber and other complex carbohydrates, as well as protein, B vitamins, and zinc.

Serving size: 1/2 cup hot cereal • 1 ounce dry cereal • 1 slice bread

Fruit (3 or more servings a day)

Fruits are rich in fiber, vitamin C, and beta-carotene. Be sure to include at least one serving each day of fruits high in vitamin C—citrus fruits, melons, and strawberries are all good choices. Choose whole fruit over fruit juices, which do not contain very much fiber.

Serving size: 1 medium piece of fruit • 1/2 cup cooked fruit • 4 ounces juice

Legumes (2 or more servings a day)

Legumes, including beans, peas, and lentils, are all good sources of fiber, protein, iron, calcium, zinc, and B vitamins. This group also includes chickpeas, baked and refried beans, soymilk, tempeh, and texturized vegetable protein.

Serving size: 1/2 cup cooked beans • 4 ounces tofu or tempeh • 8 ounces soymilk

Be sure to include a good source of vitamin B_{12}, such as fortified cereals or vitamin supplements.

SETTING BLAME ASIDE

Occasionally, people who have cancer report feeling that, if food plays a role in cancer, they are somehow to blame for their disease. Guilt and blame thus sometimes become concerns for people dealing with cancer. However, these feelings help no one, and it makes no sense to blame people for lacking information about things they had no way of knowing. Until major public education programs spread the word about the role of dietary factors, cancer will remain an epidemic.

STEPS TO CANCER PREVENTION

- Do not use tobacco in any form.
- Eat a varied menu of whole grains, vegetables, fruits, and beans, without added fats, that supplies generous amounts of fiber, vitamins, and minerals, and derives less than 10 percent of its calories from fat.
- Have more than one vegetable at each meal and five to nine fruits and vegetables each day.
- Avoid animal products and minimize added vegetable oils.
- Minimize alcohol intake.
- Engage in regular physical activity.
- Maintain your weight at or near your ideal level.
- Avoid excessive sunlight and unnecessary X-rays.

SURVIVING CANCER

Foods are important, not only in preventing cancer, but also in improving survival for those who already have cancer.

BREAST CANCER: SURVIVAL

Not all cancers of the breast are the same. Some have a relatively good prognosis, and others have a very poor prognosis. For example, a tumor that is small and has not spread to the lymph nodes or other organs is less dangerous than a tumor that is larger and has already spread. (Lymph nodes are pea-sized collections of cells near the breast and other organs; they are important to immune function.) Hospital laboratories also determine whether a breast tumor has receptors for estrogen or progesterone hormones. If it does, the tumor is slightly less aggressive than a tumor lacking receptors.

These prognostic factors are not due to chance alone. Thirty years ago, Ernst Wynder of the American Health Foundation in New York observed that Japanese women are much less likely than American women to get breast cancer, in addition, when Japanese women do get the disease, they tend to survive longer.[32] Their improved survival is independent of age, tumor size, estrogen receptor status, the extent of spread to lymph nodes, and the microscopic appearance of the cancer cells. And it is not that Japanese women have better health care, because the same pattern has been observed in Hawaii and California, where Japanese women live near other ethnic groups and have essentially the same health-care system.

Researchers have begun to look at whether diet plays a role in survival. It does. Our old enemy, fat in foods, rears its ugly head once again. The more fat in the diet, the shorter the survival time. In one Canadian research study, women with cancer were more likely to have lymph node involvement if they had a higher fat intake. This effect was found only for saturated fat and only for postmenopausal women.[33] Fat seems to have a measurable effect when cancer has spread to other parts of the body and little or no effect when the disease is localized.

Researchers in Buffalo, New York, calculated what they believe to be the degree of risk posed by fat in the diet: For a woman with metastatic breast cancer (cancer that has already spread at the time of diagnosis), the risk of dying from the disease at any point increases 40 percent for every 1,000 grams of fat consumed monthly.[34] To understand what this means, compare three different diets, each of which contains 1,800 calories per day:

- On a low-fat vegetarian diet, about 10 percent of calories come from fat. This type of diet contributes about 20 grams of fat per day, or 600 grams per month.
- On a typical American diet, 35 percent of calories come from fat. This means about 70 grams of fat per day, or 2,100 grams per month.
- On a diet with more fat than average, say 50 percent of calories, fat intake would be 100 grams per day, or 3,000 grams per month.

If the researchers' finding holds, the typical American diet would lead to about a 60 percent higher risk of dying of breast cancer at any given point, compared to the low-fat vegetarian diet, and the high-fat diet would lead to a more than 95 percent increase in risk of dying. These figures do not mean that a woman's risk of dying is 60 percent or 95 percent. They mean that the risk is 60 percent or 95 percent higher than it would otherwise have been, assuming the individual is comparable to those studied.

Other parts of the diet play important roles. Diets high in fiber, carbohydrate, and vitamin A seem to help the prognosis, while alcohol slightly worsens it.[35] Patients who have more estrogen receptors on their tumors—(which indicates a better prognosis)—tend to be those who had consumed more vitamin A. (Beta-carotene becomes vitamin A in the body.) For reasons that are not entirely clear, vegetables and fruits (and the vitamins they contain) help keep the cells of the body in better working order—one sign of which, for breast cells, is the presence of estrogen receptors. So vegetables and fruits are not only important in helping to prevent cancer, they also help improve survival for those who have cancer.

Higher body weight increases the risk of dying of breast cancer. Among postmenopausal women with breast cancer, slimmer women tend to have less lymph node involvement. Heavier women have more lymph node involvement, higher rates of recurrence, and poorer survival rates.

CANCERS OF THE UTERUS AND OVARY: SURVIVAL

The uterus and ovary, like the breast, are strongly influenced by sex hormones. Again, a low-fat vegetarian diet is the best prescription for preventing the hormonal elevations that encourage cancer. In addition, as mentioned earlier, galactose—a

A low-fat vegetarian diet is the best prescription for preventing the hormonal elevations that encourage cancer.

product of the breakdown of the milk sugar lactose—may increase the risk of ovarian cancer.

One might assume that the factors that improve breast cancer survival could do the same for cancers of the uterus and ovary. Unfortunately, researchers have not yet tackled this issue. Until more information is available, it seems most prudent for those with ovarian or uterine cancer to follow the same diet that helps prevent cancer in these organs and that keeps the immune system in good working order: a low-fat vegetarian diet rich in vegetables and fruits.

PROSTATE CANCER: SURVIVAL

Diet may help improve survival in prostate cancer as well. When pathologists conduct autopsies of men who die from accidents or other causes, they find cancer cells in the prostates of about 20 percent of them.[36] These men did not know they had cancer and had no symptoms whatsoever. The prevalence of such latent cancers actually varies with location: the lowest rates are in Singapore (13 percent) and Hong Kong (15 percent) and the highest are in Sweden (31 percent).[36] In most men, the cells never grow into a large tumor, never spread, and never affect life or health in any way. However, just as the prevalence of latent cancers varies from one country to another, the likelihood that they will turn into symptomatic cancer varies in precisely the same way, suggesting that the same factors that cause cancer cells to form in the first place also encourage them to grow and spread. So while a Swede is twice as likely as a man from Hong Kong to have cancerous cells in his prostate, he is more than eight times more likely to die of prostate cancer.

A low-fat, high-fiber diet can help eliminate the hormonal aberrations that are known to be linked with prostate cancer and may help improve survival among those who have the disease.

In a 2002 study of men with prostate cancer, Dr. Dean Ornish tested a low-fat vegan diet, along with regular exercise and stress management. In the 42 men in the control group, the amount of prostate-specific antigen (PSA, which is used as an indicator of cancer advancement) levels rose over the three-month study period, and seven required additional treatment. But in the 42 men assigned to the vegan diet and lifestyle intervention, the average PSA level dropped from 6.3 to 5.8, and none required further treatment.[37]

COLON CANCER: SURVIVAL

Colon cancer is encouraged by diets containing animal fat and discouraged by diets rich in vegetables. A low-fat, plant-based diet is important both for those seeking to prevent cancer and those who have already been treated for it.

Researchers at the University of Arizona found that people who have been treated for colon or rectal cancer have less risk of recurrence when their diets are rich in fiber. They found benefits from daily supplements of 13.5 grams of wheat bran fiber (the amount in a half-cup of bran cereal), but they speculate that other forms of fiber might have the same effect. A vegetarian diet can easily boost fiber intake by 10 to 29 grams per day. If you have bran cereal, topping it with soymilk rather than cow's milk allows you to avoid animal fat, cholesterol, lactose, and animal proteins.

Colon cancer typically develops from polyps in the colon wall. These polyps become smaller and fewer in number within six months on a high-fiber diet.

It is clear that much more needs to be learned about the power of foods to prevent cancer or to improve cancer survival. The good news is that the diet that helps protect against cancer is the same one that keeps cholesterol low and waistlines slim. Eliminating animal products from the diet, keeping oils to a minimum, and including generous amounts of vegetables, grains, beans, and fruits is a powerful prescription.

THE THREE-STEP WAY TO GO VEGETARIAN

If you are making the switch to a vegetarian diet for its health benefits, you'll be pleased to discover a wonderful additional benefit to vegetarian eating: it's It's a delicious and fun way to explore new foods. A vegetarian meal can be as familiar as spaghetti with marinara sauce, as comforting as a bowl of rich potato soup, or as unusual as Rootin' Tootin' Salad (see the recipe on page 12).

The switch to a vegetarian diet is easier than you might think. Most people, whether vegetarians or meat-eaters, typically use a limited variety of recipes; the average family eats only eight or nine different dinners repeatedly. You can use a simple, three-step method to come up with nine vegetarian dinner menus that you enjoy and can prepare easily.

First, think of three vegetarian meals you already enjoy. Common ones are pasta primavera, vegetable stir-fry, and vegetable stew.

Second, think of three recipes you prepare regularly that can easily be adapted to a vegetarian menu. For example, a favorite chili recipe can be made with almost the same ingredients; just replace the meat with beans or texturized vegetable protein. Prepare bean burritos (using canned vegetarian refried beans) instead of beef burritos, veggie burgers instead of hamburgers, and grilled eggplant and roasted red peppers instead of grilled chicken in sandwiches. Many soups, stews, and casseroles also can be made into vegetarian dishes with a

few simple changes.

Third, check out some vegetarian cookbooks from the library and experiment with the recipes for a week or so until you find three new recipes that are delicious and easy to make. You can also explore the many recipes offered on our Web site, *www.cancerproject.org*. Just like that, with minimal changes to your menus, you will have nine vegetarian dinners.

After that, coming up with vegetarian options for breakfast and lunch is easy. Try muffins with fruit spread, cholesterol-free French toast, or cereal for breakfasts. Sandwiches, with spreads like hummus or white bean pâté with lemon and garlic, pasta salads, or even dinner leftovers make great lunches.

TIPS FOR MAKING THE SWITCH TO A VEGETARIAN DIET

- Convenience foods cut cooking time. Supermarkets and natural foods stores stock a huge array of instant soups and main-dish vegetarian convenience items. Many canned soups, such as minestrone, black bean, or vegetable, are vegetarian. Flavored rice or other grain mixes, like curried rice or tabouli salad, can be stretched into an entrée with a can of beans. Visit the frozen food section for internationally inspired vegetarian frozen entrées such as corn and bean enchiladas, lentil curry, or vegetarian pad thai. Or try vegetarian baked beans, refried beans, sloppy joe sauce, and meatless spaghetti sauce from the canned goods aisle.
- Ask for it! Even restaurants that don't offer vegetarian entrées can usually whip up a meatless pasta or vegetable plate if you ask. If attending a catered affair, catch the waiter before you are served and ask him or her to remove the chicken breast from your plate and slip on an extra baked potato.
- When you're dining out, the best bets for finding vegetarian food are international restaurants. Italian, Chinese, Mexican, Thai, Japanese, and Indian restaurants all offer a wide variety of vegetarian dishes.
- Summer barbecues are healthy and fun with meatless hot dogs and burgers, which are now available in most supermarkets. Or, for a real change of pace, grill thick slices of marinated vegetables like eggplant, zucchini, or tomatoes.

REFERENCES

1. American Cancer Society. *Cancer Facts and Figures—1997.* Atlanta, GA: 1999.
2. Minamoto T, Mai M, Ronai Z. Environmental factors as regulators and effectors of multistep carcinogenesis. *Carcinogenesis.*1999;20(4):519–27.
3. National Cancer Institute. *Cancer Rates and Risks*. Washington, DC: 1985.
4. Doll R, Peto R. The causes of cancer: quantitative estimates of avoidable risks of cancer in the United States today. *J Natl Cancer Inst.* 1981;66:1191–308.
5. Block G. Epidemiologic evidence regarding vitamin C and cancer. *Am J Clin Nutr.* 1991;54(6 Suppl):1310S–4S.
6. Barone J, Hebert JR, Reddy MM. Dietary fat and natural killer cell activity. *Am J Clin Nutr.* 1989;50:861–7.
7. Nordenstrom J, Jarstrand C, Wiernik A. Decreased chemotactic and random migration of leukocytes during intralipid infusion. *Am J Clin Nutr.* 1979;32:2416–22.
8. Hawley HP, Gordon GB. The effects of long chain free fatty acids on human neutrophil function and structure. *Lab Invest.* 1976;34:216–22.
9. Malter M, Schriever G, Eilber U. Natural killer cells, vitamins, and other brood components of vegetarian and omnivorous men. *Nutr Cancer.* 1989;12:271–8.
10. Toniolo P, Riboli E, Protta F, Charrel M, Cappa AP. Calorie providing nutrients and risk of breast cancer. *J Natl Cancer Inst.* 1989;81:278–86.
11. Cho E, Spiegelman D, Hunter DJ, et al. Premenopausal fat intake and risk of breast cancer. *J Natl Cancer Inst.* 2003 Jul 16;95(14):1079–85.
12. Willett WC. Dietary fat and risk of breast cancer. *N Engl J Med.* 1987a;316:22–8.
13. De Stefani E, Ronco A, Mendilaharsu M, Guidobono M, Deneo-Pellegrini H. Meat intake, heterocyclic amines, and risk of breast cancer: a case-control study in Uruguay. *Cancer Epidemiol Biomarkers Prev.* 1997;6(8):573–81.
14. Sinha R, Rothman N, Brown ED, et al. High concentrations of the carcinogen 2-amino-1-methyl-6-phenylimidazo-[4,5] pyridine [PhlP] occur in chicken but are dependent on the cooking method. *Cancer Res.* 1995;55:4516–19.
15. Hergenrather J, Hlady G, Wallace B, Savage E. Pollutants in breast milk of vegetarians. *Lancet.* 1981;304:792.
16. Howell MA. Factor analysis of international cancer mortality data and per capita food consumption. *Br J Cancer.* 1974;29:328–36.
17. Blair A, Fraumeni JF, Jr. Geographic patterns of prostate cancer in the United States. *J Natl Cancer Inst.*1978;61:1379–84.
18. Kolonel LN, Hankin JH, Lee J, Chu SY, Nomura AMY, Hinds MW. Nutrient intakes in relation to cancer incidence in Hawaii. *Br J Cancer.* 1981;44:332–9.
19. Rotkin ID. Studies in the epidemiology of prostatic cancer: expanded sampling. *Cancer Treat Rep.* 1977;61:173–80.
20. Schuman LM, Mandel JS, Radke A, Seal U, Halberg F. Some selected features of the epidemiology of prostatic cancer: Minneapolis St. Paul, Minnesota case control study, 1976–1979. In: Magnus K, ed. *Trends in Cancer Incidence: Causes and Practical Implications.* Washington, DC: Hemisphere Publishing Corp., 1982.
21. Graham S, Haughey B, Marshall J, et al. Diet in the epidemiology of carcinoma of the prostate gland. *J Natl Cancer Inst.* 1983;70:687–92.
22. Ross RK, Shimizu H, Paganini-Hill A, Honda G, Henderson BE. Case-control studies of prostate cancer in blacks and whites in Southern California. *J Natl Cancer Inst.* 1987;78:869–74.
23. Severson RK, Nomura AM, Grove JS, Stemmermann GN. A prospective study of demographics, diet, and prostate cancer among men of Japanese ancestry in Hawaii. *Cancer Research.*1989;49:1857–60.
24. Oishi K, Okada K, Yoshida O, et al. A case control study of prostatic cancer with reference to dietary habits. *Prostate.* 1988;12:179–90.
25. Mettlin C, Selenskas S, Natarajan N, Huben R. Beta-carotene and animal fats and their relationship to prostate cancer risk: a case-control study. *Cancer.* 1989;64:605–12.
26. Armstrong B, Doll R. Environmental factors and cancer incidence and mortality in different countries, with special reference to dietary practices. *Int J Cancer.* 1975;15:617–31.
27. Chan JM, Stampfer MJ, Giovannucci E, et al. Plasma insulin-like growth factor-I and prostate cancer risk: a prospective study. *Science.* 1998;279:563–5.
28. Giovannucci E, Rimm EB, Wolk A, et al. Calcium and fructose intake in relation to risk of prostate cancer. *Cancer Res.* 1998a;58:442–7.
29. Chan JM, Stampfer MJ, Ma J, Gann PH, Gaziano JM, Giovannucci E. Dairy products, calcium, and prostate cancer risk in the Physicians' Health Study. *Am J Clin Nutr.* 2001;74:549–54.
30. Giovannucci E, Rimm EB, Liu Y, Stampfer MJ, Willett WC. A prospective study of tomato products, lycopene, and prostate cancer risk. *J Natl Cancer Inst.* 2002;94:391–8.
31. DeCosse JJ, Miller HH, Lesser ML. Effect of wheat fiber and vitamins C and E on rectal polyps in patients with familial adenomatous polyposis. *J Natl Cancer Inst.* 1989;81:1290–7.
32. Wynder EL, Kajitani T, Kuno J, Lucas JC, Jr, DePalo A, Farrow J. A comparison of survival rates between American and Japanese patients with breast cancer. *Surg Gynec Obstet.* 1963;117:196–200.
33. Verreault R, Brisson J, Deschenes L, Naud F, Meyer F, Belanger L. Dietary fat in relation to prognostic indicators in breast cancer. *J Natl Cancer Inst.* 1988;80:81925.
34. Newman SC, Miller AB, Howe CR. A study of the effect of weight and dietary fat on breast cancer survival time. *Am J Epidemiol.* 1986;123:767–74.
35. Holm LE, Callmer E, Hjalmar ML, Lidbrink E, Nilsson B, Skoog L. Dietary habits and prognostic factors in breast cancer. *J Natl Cancer Inst.* 1989;81:1218–23.
36. Breslow N, Chan CW, Dhom G, et al. Latent carcinoma of prostate at autopsy in seven areas. *Int J Cancer.* 1977;20:680–8.
37. Annual Meeting of the American Urological Association, Chicago, April 26–May 1, 2003. Dean Ornish, MD, University of California, San Francisco. Philip Belitsky, MD, Dalhousie University, Halifax, Nova Scotia, Canada.

RECIPES

Hoppin' John Salad *(Makes about 5 cups)*

For the salad:
2 cups cooked black-eyed peas (1 cup dry) or 1 15-ounce can, drained
1 1/2 cups cooked brown rice (1/2 cup uncooked)
1/2 cup finely sliced green onions
1 celery stalk, thinly sliced (about 1/2 cup)
1 tomato, diced
2 tablespoon finely chopped parsley

For the vinaigrette:
1/4 cup lemon juice
1 tablespoon olive oil
1/4 teaspoon salt
1-2 garlic cloves, crushed

Combine the salad ingredients in a mixing bowl. Mix together the vinaigrette ingredients and pour over salad. Toss gently. Chill 1 to 2 hours before serving if time permits.

Recipe from *Turn Off the Fat Genes* by Neal D. Barnard, M.D.; recipe by Jennifer Raymond

Buckwheat Corncakes
(Makes 16 3-inch pancakes)

Buckwheat adds a wonderful, hearty flavor to these easily prepared pancakes. Serve them with homemade applesauce, fresh fruit, or maple syrup.

1/2 cup buckwheat flour
1/2 cup cornmeal
1/2 teaspoon sodium-free baking powder
1/4 teaspoon baking soda
1/4 teaspoon salt
1 ripe banana, mashed
2 tablespoons maple syrup
1 tablespoon vinegar
1 cup fortified soymilk or rice milk

Mix buckwheat flour, cornmeal, baking powder, baking soda, and salt.

In a large bowl, combine mashed banana, maple syrup, vinegar, and milk. Add flour mixture, stirring just enough to remove any lumps and make a pourable batter. Add a bit more milk if batter seems too thick.

Preheat a non-stick skillet or griddle, then spray lightly with vegetable oil. Pour small amounts of batter onto the heated surface and cook until tops bubble. Turn carefully with a spatula and cook the second sides until browned, about 1 minute. Serve immediately.

Recipe from *Healthy Eating for Life for Women* by Kris Kieswer

Spaghetti Balls *(Makes 36 balls)*

Pour 1 3/4 cups boiling water over 2 cups dry textured vegetable protein and soak for 10 minutes.

Steam together for a few minutes:
1/2 cup water
1 small onion, diced

Mix onion with textured vegetable protein and stir in:
1/2 cup unbleached flour
1 teaspoon salt
1 tablespoon low-sodium soy sauce
1/2 teaspoon chili powder
1/2 teaspoon garlic powder
1/2 teaspoon oregano

Shape this mixture into balls one inch in diameter, pressing firmly. Spray vegetable oil into a non-stick pan and cook balls until browned. Serve with your favorite tomato sauce in whole grain buns or over pasta.

Recipe from *The Survivor's Handbook: Eating Right for Cancer Survival* by Neal D. Barnard, M.D.

Quick Bean Burritos *(Serves 4)*

4 fat-free flour or corn tortillas
1 15-ounce can fat-free refried beans or black beans
1 cup shredded romaine lettuce
2 medium green onions, sliced
1/2 cup Tomato Corn Salsa *(recipe follows)* or other salsa
1/2 cup Guacamole Plus *(recipe follows)*

Heat beans in small saucepan or in microwave until warmed through. In a large skillet, heat a tortilla until it is warm and soft, or warm tortillas in the microwave if making more than 4 tortillas. Spread about 1/2 cup of the beans down the center, then top with lettuce, green onions, salsa, and the guacamole. Fold the bottom end toward the center, then roll the tortilla around the filling. Repeat with remaining tortillas or let those dining make their own.

Recipe adapted from *Foods That Fight Pain* by Neal D. Barnard, M.D.; recipe by Jennifer Raymond

Tomato Corn Salsa *(Makes 3 1/2 cups)*

1 cup fresh or frozen corn kernels, thawed
2 cups diced tomatoes
2 tablespoons diced red onions
1/4 cup diced green bell peppers
1 tablespoon chopped fresh basil
1/2 to 1 fresh green chile, minced or 1/2 to 1 teaspoon of your favorite chili sauce
1 tablespoon fresh lime juice
1 teaspoon rice or cider vinegar

If corn is not thawed completely, either blanch it in boiling water to cover for 1 to 2 minutes, or microwave it until thawed. Drain. In a large bowl, combine all of the ingredients and set aside for 15 to 20 minutes to allow the flavors to develop. Add salt, if desired and serve at room temperature.

Recipe from *The Survivor's Handbook: Eating Right for Cancer Survival* by Neal D. Barnard, M.D.

Guacamole Plus *(Makes 2 1/2 cups)*

This guacamole is enriched with fiber from the peas and cancer-fighting phytochemicals from the garlic, salsa, scallions, and lemon.

1 cup frozen green peas or drained and rinsed canned peas
1 ripe avocado, peeled
1/2 cup mild salsa
1 clove garlic, minced, or 1 teaspoon chopped garlic
1 scallion, minced (optional)
juice of 1 lemon
1/2 teaspoon cumin
1 tablespoon fresh cilantro, chopped (optional)
salt and pepper, to taste

If using frozen peas, blanch peas in boiling water for 2 minutes, then cool with cold water and drain. Cut avocado into large chunks. Mash avocado and peas together using a potato masher or fork, or, if a very creamy texture is desired, in a food processor. Mix in salsa, garlic, scallion (if using), lemon juice, cumin, and cilantro (if using). Add salt and pepper to taste.

Recipe from *The Survivor's Handbook: Eating Right for Cancer Survival* by Neal D. Barnard, M.D.

Rootin' Tootin' Salad *(Serves 6)*

1 15-ounce can diced beets, drained
1 small jicama, peeled and cut into thin strips or diced
2 medium carrots, peeled and cut into thin strips or diced
3 tablespoons of lemon juice
2 tablespoons seasoned rice vinegar
3 teaspoons stoneground mustard
1/2 teaspoon dried dill weed

Place beets, jicama, and carrot pieces into a large bowl. Mix lemon juice, vinegar, mustard, and dill; pour over the salad. Mix. Serve warm or chilled.

Recipe from *The Survivor's Handbook: Eating Right for Cancer Survival* by Neal D. Barnard, M.D.

Lentil Barley Stew *(Makes about 1 1/2 quarts)*

1/2 cup lentils, rinsed
1/4 cup hulled or pearled barley
1 quart vegetable broth or water
1 small onion, chopped
1 garlic clove, pressed or minced
1 carrot, diced
1 celery stalk, sliced
1/2 teaspoon oregano
1/2 teaspoon ground cumin
1/4 teaspoon red pepper flakes
1/4 teaspoon black pepper
1/2–1 teaspoon salt

Place all ingredients except salt into a large pot and bring to a simmer. Cover and cook, stirring occasionally, until lentils and barley are tender, about 1 hour. Add salt to taste.

Recipe from *Healthy Eating for Life for Children* by Amy Lanou, Ph.D.

Penne with Fresh Spinach, Tomatoes, and Olives *(Serves 4)*

1 tablespoon olive oil
1 medium onion, chopped
2 14.5-ounce cans chopped tomatoes
1/2 cup kalamata olives, pitted and sliced
10-16 ounces fresh spinach, coarsely chopped
1 tablespoon chopped fresh parsley
8 ounces penne pasta
1/4 cup vegan parmesan cheese or nutritional yeast (optional)

Heat oil in a large, nonstick skillet. Add onion and sauté over medium heat for 3 minutes. Add chopped tomatoes. Bring to a boil and then reduce heat, cover, and simmer for 20 minutes. Add sliced olives, chopped spinach, and parsley. Cook an additional 5 minutes.

Meanwhile, cook pasta according to package directions, omitting any fat or salt. Drain and transfer to a serving bowl. Add spinach mixture and toss gently. Serve immediately. Sprinkle vegan parmesan or nutritional yeast over top, if desired.

Recipe from *The Best in the World*, edited by Neal D. Barnard, M.D.

Missing Egg Sandwich *(Serves 6)*

These sandwiches have the flavor and appearance of egg salad without the saturated fat and cholesterol.

1/2 pound firm reduced-fat tofu (1 cup)
1 green onion, finely chopped, including green top
2 tablespoons pickle relish
2 tablespoons vegan mayonnaise
2 teaspoons stone-ground mustard
2 teaspoons reduced-sodium soy sauce
1/4 teaspoon cumin
1/4 teaspoon turmeric
1/4 teaspoon garlic powder
12 slices whole-grain bread
6 lettuce leaves
6 tomato slices

Mash tofu, leaving some chunks. Add green onion, pickle relish, vegan mayonnaise, mustard, soy sauce, cumin, turmeric, and garlic powder. Mix well. Spread on whole-grain bread and garnish with lettuce and tomato slices.

Recipe from *The Survivor's Handbook: Eating Right for Cancer Survival* by Neal D. Barnard, M.D.

Mixed Greens with Apples and Walnuts *(Makes about 4 cups)*

Using a pre-washed salad mix makes it easy to prepare.

6 cups salad mix or washed and torn butter lettuce
1 tart green apple (Granny Smith, pippin, or similar)
1/4 cup chopped walnuts
3-4 tablespoons seasoned rice vinegar

Place salad mix or torn leaf lettuce into a bowl. Core and dice apple and add to salad along with walnuts. Sprinkle with seasoned rice vinegar and toss to mix.

Summer Fruit Compote *(Serves 4)*

2 cups peeled and sliced fresh peaches (peeling is optional)
2 cups hulled fresh strawberries
1/2 cup white grape juice concentrate or apple juice concentrate

In a large saucepan, combine all ingredients. Bring to a simmer and cook for about 5 minutes, or until fruit just becomes soft. Serve warm or cold by itself, or over fruit sorbet or vanilla soy ice cream.

Recipe from *Foods That Fight Pain* by Neal D. Barnard, M.D.; recipe by Jennifer Raymond

Chocolate Mousse or Mousse Pie *(Serves 8)*

1 cup semi-sweet, non-dairy chocolate chips
1/2 cup soy- or other non-dairy milk
1 package Mori-Nu silken tofu (firm or extra firm)
1/3 cup sweetener of your choice
1/2 teaspoon vanilla extract

Combine the chocolate and non-dairy milk in a microwave-safe bowl or double boiler and melt, using gentle heat and stirring often. Remove from heat. Crumble tofu in a blender or food processor. Add melted chocolate and non-dairy milk, sweetener, and vanilla extract. Process until completely smooth, pausing the blender or food processor to scrape down the sides and under the blade as necessary. Chill the mixture in serving bowls or, if desired, a graham cracker or cookie crust, for at least 1 hour before serving. Garnish with fruit.

Variation: add a chopped banana to the food processor when you process the tofu and chocolate together.

Recipe from *The Survivor's Handbook: Eating Right for Cancer Survival* by Neal D. Barnard, M.D.

THE CANCER PROJECT

Help Us Win the Battle Against Cancer

About The Cancer Project

With over one million people being diagnosed with cancer in the United States each year—and many more cases in other countries across the globe—there is an urgent need for a new direction in battling this disease. The Cancer Project is a collaborative effort of physicians, researchers, and nutritionists who have joined together to educate the public on how a healthy diet can protect us from cancer and help us regain our health once cancer has been diagnosed.

The Key Is Information

Most Americans do not yet have the facts about the relationship between nutrition and cancer. Surveys conducted by Opinion Research Corporation International have repeatedly found that most people have never heard of links between diet and cancer. In other words, information has not been getting to people who need it.

That is why we established The Cancer Project—to disseminate life-saving information as widely as possible and keep it from being buried in medical libraries.

Getting the Word Out

The Cancer Project distributes information on reducing cancer risk and, when cancer has been diagnosed, how diet and other factors may help improve survival. Vital information has reached millions of individuals and families through brochures, television advertisements, Web-based information, and nutrition and cooking classes.

The Cancer Project also distributes thousands of pieces of information to health professionals at conferences and conventions. We stress the need for more effective educational efforts on nutrition and cancer prevention. Televised public service announcements are released nationally twice a year. The Cancer Project's Food for Life nutrition and cooking class series for cancer prevention and survival is being taught all over the country to help individuals understand how and why to cook nutritiously. The classes not only help individuals understand how and why to cook nutritously, they also act as a lighthearted support group for cancer survivors or those who have been touched by cancer in some way. *The Survivor's Handbook* and the companion video, *Eating Right for Cancer Survival*, were developed to accompany the class series, but they can also be used on their own to help cancer survivors or individuals interested in cancer prevention have access to this vital information at home.

Your Help Makes It Possible!

The success of our efforts depends entirely on the resources available for producing and distributing printed information, funding our research, working with the media, staffing booths at medical conferences, and teaching our Food for Life nutrition and cooking classes. Both large and small contributions make an enormous difference.

If you wish to support our work to advance cancer prevention and survival through nutrition education and research, you may donate online at *www.CancerProject.org*. If you prefer, you can mail or phone in your contribution to:

The Cancer Project
5100 Wisconsin Ave. NW, Suite 400
Washington, DC 20016
Phone: 202-244-5038
www.CancerProject.org

THE CANCER PROJECT
5100 WISCONSIN AVE., NW, SUITE 400
WASHINGTON, DC 20016

ADDRESS SERVICE REQUESTED