



# Heart-Healthy Diet

## General Guidelines

The goals of a heart-healthy diet are to eat foods that help obtain or maintain healthy cholesterol and lipid levels: to reduce overall levels and low-density lipoproteins (LDL) and to increase high-density lipoproteins (HDL). Reducing other lipids, such as triglycerides and lipoprotein(a) (Lp(a)) are also important. Any diet should also help keep blood pressure under control.

## Fats and Oils

**General Recommendations for Fat Intake.** About two-thirds of cholesterol in the body does not come from cholesterol in food but is manufactured by the liver, its production stimulated by saturated fat (mostly found in animal products). The dietary key to managing cholesterol, then, lies in understanding fats and oils. When it comes to studying the effects of fat on the body, however, the problem is compounded by its complex nature. All fats found in foods are made up of chains of molecules composed of carbon and glycerol called fatty acids. Fats and oils are composed of three major chains: monounsaturated, polyunsaturated, and saturated fatty acids. Taken together, they are called a triglyceride. Hydrogen atoms bond to these chains: monounsaturated fatty acids have the fewest hydrogen atoms; polyunsaturated fatty acids have two or more bonds; and saturated fatty acids have the maximum. Monounsaturated and polyunsaturated fatty acids are found in plant products and saturated fatty acids are found in animal products and some tropical oils. The oils and fats that people and animals eat are nearly always mixtures of all three fatty acids, but one type usually predominates. In addition, there are three chemical subgroups of polyunsaturated fatty acids: omega-3, omega-6, and omega-9 fatty acids. To complicate matters, there are also trans-fatty acids. These are not natural fats but are manufactured by adding another hydrogen molecule, a process known as hydrogenation, to polyunsaturated fatty acids. These subgroups are being heavily researched for their specific effects on health. All fats, both good ones and bad, add the same calories. Although there is much controversy on the overall effects of fat on health, virtually all experts strongly advise limiting intake of saturated fats and trans-fatty acids (found in commercial baked goods and fast foods). Other fatty acids, however, may offer benefits. In order to calculate daily fat intake, multiply the number of fat grams eaten by 9 (one fat gram is equal to 9 calories, whether it's saturated or unsaturated) and divide by the number of total daily calories desired. One teaspoon of oil, butter, or other fats equals about five grams of fat.

**Harmful Fats.** Reducing consumption of saturated fats and trans-fatty acids is the first essential step in managing cholesterol levels through diet. Saturated fats are found predominantly in animal products, including meat and dairy products.

Saturated fats in the diet increase blood cholesterol levels. The so-called tropical oils - palm, coconut, and cocoa butter, are also high in saturated fats. Evidence is lacking, however, about their effects on the heart. The countries with the highest palm-oil intake, Costa Rica and Malaysia, also have much lower heart disease rates and cholesterol levels than Western nations.

**Trans-fatty acids are also dangerous for the heart**, and they may pose a risk for certain cancers. They are created during a process aimed at stabilizing polyunsaturated oils to prevent them from becoming rancid and to keep them solid at room temperature. Some experts believe that these partially hydrogenated fats are even worse than saturated fats because they both **increase LDL and reduce HDL** cholesterol levels and may have unhealthy effects on the linings of the arteries. One study of 80,000 nurses reported that women whose total fat consumption was 46% of total caloric intake had no greater risk in general for a heart attack than did those for whom fat represented 30% of calories consumed. Women whose diets were high in trans-fatty acids, however, had a 53% increased risk for heart attack compared to those who consumed the least of those fats. Hydrogenated fats are used in stick margarine and in many fast foods and baked goods, including most commercially-produced white breads. (Liquid margarine is not hydrogenated and is recommended, as is margarine labeled "trans-fatty acid free.") The FDA has now required that food labels include information on trans-fatty acids.

**Beneficial Fats and Oils.** It should be noted that some fat is essential for health and fat is essential for healthy development in children. Public attention has mainly focused on the possible benefits or hazards of monounsaturated (MUFA) and polyunsaturated (PUFA) fats. Polyunsaturated fats are found in safflower, sunflower, corn, cottonseed oils, and fish, while monounsaturated fats are mostly present in olive, canola, and peanut oils and in most nuts. Studies, however, do not all agree on their effects. For example, early studies indicate that monounsaturated fats help to maintain healthy HDL levels while polyunsaturated fats reduce them. A 2000 study comparing olive oil (high in MUFA) with sunflower oil (high in PUFA) reported that olive-oil rich diets were strongly associated with lower blood pressure while sunflower diets had only a small effect. Researchers are most interested in the smaller fatty-acid building blocks contained in these oils called essential fatty acids, which may have more specific effects on lipids: three important fatty acids are omega-3, omega-6, and omega-9. Food oils often contain a combination of these building blocks, which may account for the mixed results observed in people consuming them.

**Omega-3 fatty acids:** They are further categorized as alpha-linolenic acid (sources include canola oil, soybeans, flaxseed, olive oil, and many nuts and seeds) and docosahexaenoic and eicosapentanoic acids (sources are oily fish and breast milk). Studies have indicated that vegetable oils containing alpha-linolenic acids are heart protective. Fish oils, which contain docosahexaenoic and eicosapentanoic acids, do not have much effect on cholesterol but they may

benefit the lining of blood vessel (the endothelium) and therefore improve blood flow. [See also, Fish under Protein, below.]

**Omega-6 fatty acids:** further categorized as linoleic, or linolic, acid (sources are flaxseed, corn, soybean, and canola oil). Many hydrogenated fats are made from oils rich in omega-6 fatty acids.

**Omega-9 fatty acids:** (Source is olive oil). Studies indicate that, in a healthy balance, all of these fatty acids are essential to life. Studies have found greater protection against heart disease from omega-6-oils than omega-3, but omega-6 is also associated with increased production of compounds called eicosanoids, which enhance tumor growth in animals. Both omega-3 and omega-9 fatty acids contain chemicals that block these eicosanoids. Some researchers believe, however, that our current Western diet now contains an unhealthy ratio, 10 to 1, of omega-6 to omega-3 fatty acids. The bottom line, then, is to try to obtain a better balance of fatty acids without consuming too many calories.

**Fat Substitutes.** Fat substitutes added to commercial foods or used in baking deliver some of the desirable qualities of fat, but do not add as many calories. Some replacers, such as the cellulose gel Avicel, Carrageenan (made from seaweed), guar gum, and gum arabic, have been used for decades in many commercial foods. New, synthetic fat substitutes are now available, but little is known about their long-term effects. Olestra (Olean) passes through the body without leaving behind any calories from fat. (It should be noted, however, that foods containing olestra still have calories from carbohydrates and proteins.) Early reports of cramps and diarrhea after eating food containing olestra have not proven to be significant. Of greater concern is the fact that even small amounts of olestra deplete the body of certain vitamins and nutrients that are important for protection against serious diseases, including cancer. The FDA requires that the missing vitamins be added back to olestra products, but not other nutrients.

Plant substances known as sterols have long been known to reduce cholesterol by impairing its absorption in the intestinal tract. A sterol called sitostanol, also called stanol, is now being used in margarines (Benecol, Take Control). Benecol is derived from pine bark and Take Control from soybeans; both are effective. Studies on stanol margarines have reported that doses of 2.5-3.0 grams lower LDL levels by as much as 15%, and total cholesterol with their use, including children with inherited high cholesterol levels. In one 1999 study, sitostanol was significantly effective in reducing cholesterol absorption, but only when it was mixed in a solution containing lecithin. Of concern is the possibility that stanol may block absorption of important fat-soluble nutrients. One study suggested that it may impair absorption of beta carotene and vitamin E but has no effect on vitamins A and D, two other fat soluble vitamins. In people already on a low-fat diet, the addition of this margarine may not add much benefit.

Under investigation are fat substitutes derived from beta-glucan, the soluble fiber found in oats and barley (eg, Nu-Trim). They may have health benefits beyond reducing calories and replacing hydrogenated or saturated fats.

People should try to limit even reduced-fat foods and fat substitutes in their diets. Although one might believe that eating reduced-fat or fat substitute products means consuming fewer calories, this is often not the case. Many commercial, lowered-fat products have extra calories from sugar and other carbohydrates. A study has found that people who consume foods that contain fat substitutes do not learn to dislike fatty foods, while people who learn to cook using foods naturally lacking or low in fat eventually lose their taste for high fat diets.

### **Complex Carbohydrates and Fiber**

Foods that are high in complex carbohydrates and fiber are as important as reducing harmful fats in maintaining a healthy diet.

**Fresh Fruits and Vegetables.** Regular consumption of fresh fruit and raw vegetables reduces deaths from stroke and coronary artery disease, may lower blood pressure, and may be protective against certain cancers. Substances found in them called phytochemicals have been found to be important, such as flavonoids, sterols, phenol, and sulfur-containing compounds. In addition, many foods, generally dark-colored fruits and vegetables, that contain these nutrients also provide fiber. Flavonoids, found in red wine, onions, and apples, may protect against damage done by cholesterol and prevent blood clots. Many dark colored berries (blueberries, sweet cherries, strawberries, and blackberries) are particularly potent antioxidants. Some studies have suggested that a chemical in garlic called S-allyl cysteine produces a cholesterol lowering effect, although two well-conducted recent studies found no heart-benefits from taking capsules containing garlic oil or powder equivalent to between one and one and half cloves a day. The preparation of these products, however, may be responsible for the lack of effect. Another recent study reported that heating garlic blocks its health-protective effects. By allowing crushed fresh garlic to stand 10 minutes before heating, however, S-allyl cysteine and other beneficial chemicals are released and are not lost when the garlic is cooked. In any case, adding garlic to a meal is an option for those who enjoy its flavor.

**Fiber:** Whole Grains and Nuts. Dietary fiber is an important component in achieving a healthy cholesterol balance. One study indicated that people on a reduced-fat diet consuming 25 grams of fiber a day lowered their cholesterol by 13% compared to 9% in another group that consumed less fiber. Other studies have reported a lower risk for heart disease in both men and women who ate more fiber, particularly from grain products. Fiber also helps weight reduction and may fight cancer. Simply adding breakfast cereal regularly to a diet appears to reduce cholesterol levels.

Fiber passes through the intestines undigested. It draws water with it and is eliminated as part of feces content. Fiber can be soluble or insoluble. Fiber is found only in plants, particularly vegetables, fruits, whole grains, nuts, and legumes (beans and peas), which offer other health benefits as well. Many studies have singled out nuts, which contain omega-3 fatty acids, fiber, and other important substances as being particularly beneficial for the heart by lowering LDL and total cholesterol without increasing triglycerides. Soluble fiber (found in nuts, oat bran, beans and other legumes, barley, prunes, and various fruits and vegetables) is particularly useful for lowering cholesterol levels, possibly because it removes bile acids from the intestine. Soluble fiber also improves blood glucose levels and appears to reduce blood pressure. Oats may be a particularly beneficial source of soluble fiber. In one study, women who had six to 11 servings of whole grains a day reduced their risk of heart disease by a third. Insoluble fiber (found in rye, wheat bran, whole grains, seeds, and fruit and vegetable peels) may also reduce fat absorption and even aid in weight reduction. It is best to obtain dietary fiber, soluble or insoluble, in foods. If it proves difficult to do so, psyllium, a grain grown in India, is an excellent soluble fiber supplement (Metamucil, Fiberall, Perdiem). Gas and bloating often accompany a high-fiber diet; to combat them, drink at least 8 glasses of water a day and use enzymes (Beano) that help digest fiber. People who increase their levels of soluble fiber should also increase water and fluid intake. Glucomannan, a natural high fiber powder obtained from a root, is showing promise in helping control blood glucose levels, cholesterol, and blood pressure. **See my Fiber Article.**

## **Protein**

**Fish.** A number of studies have reported that eating fish or shellfish at least once a week reduces the risk of sudden death from dangerous heart-rhythm abnormalities by more than one half. Oily fish, such as salmon, halibut, swordfish, and tuna, appear to be particularly beneficial. (Studies of people who take fish oil supplements, which contain omega-3 fatty acids, have found no similar benefits, indicating that fish contain other protective substances.) Other research indicates that eating fish reduces triglycerides and lipoprotein(a). Eating fish also appears to protect the nervous system and may reduce risks for other disorders, including rheumatoid arthritis, asthma, ulcerative colitis, and some types of cancers. At this time, most studies indicate that eating moderate amounts (one or two servings weekly) of fish offers the most benefits. Some studies found that very high amounts (five or six servings weekly) can be harmful. This risk may be due to the presence of mercury in many kinds of fish (salmon is one exception) and this is most important for women who are pregnant or nursing - For more info click here.

**Soy.** Soy is an excellent food. It is rich in both soluble and insoluble fiber, omega-3 fatty acids, and provides all essential proteins. Soybeans also contain natural estrogens called isoflavones, which have positive effects on lipid levels. A

number of studies have indicated that subjects that consume about 40 grams of soy protein each day reduce LDL by 13%, triglycerides by 11%, and increase HDL by 2%. Four ounces of tofu equals about eight to 13 grams of soy, and a soy burger contains about 18 grams. Powdered soy protein that contains at least 60 mg of isoflavones may provide similar benefits. Tablets of individual isoflavones found in soy, however, do not appear to offer any advantages. (Note: soy sauce contains only a trace amount of soy and is very high in sodium.) Of possible concern, a high intake of soy during pregnancy may have some adverse effect on the fetus, although only animal studies have suggested this. More research is important.

**Meat.** The fat content of meat varies depending on the type and cut. It is best to eat skinless chicken or turkey the leanest cuts of pork (loin and tenderloin), veal, and beef are nearly comparable to chicken in calories and fat and their effect on LDL and HDL levels. It should be noted, however, that even chicken and lean meat do not improve cholesterol levels, and, in terms of cardiac health, fish is a more desirable choice.

## **Sodium**

Some sodium is essential to protect the heart, but most experts agree that most Americans consume far more than is necessary. Diets high in salt accelerate the increases in blood pressure that occur as people age. Simply eliminating table and cooking salt can be somewhat beneficial, and salt substitutes, such as *Cardia*, containing mixtures of potassium, sodium, and magnesium are now available. *Cardia* is costly, however, and because most (about 75%) of the salt in people's diets comes from processed or commercial foods, the benefits of table-salt substitutes are likely to be very modest.

## **Sugar**

Sugar adds calories and increases blood glucose levels quickly. It provides no other nutrients. One study found that sugar was a risk factor for heart disease, possibly because sugar fuels obesity, which boosts very low density lipoproteins and triglycerides that are dangerous for the heart. Artificial sweeteners include saccharin, aspartame (Nutra-Sweet), acesulfame K (Sweet One), and Sucralose (Splenda). I prefer Splenda as a sugar substitute as it is made from sugar.

## **Dietary Cholesterol**

The story on cholesterol found in the diet is not entirely straightforward. Cholesterol is found only in animal tissues, with high amounts occurring in meat, dairy products, egg yolks, and shellfish. American Heart Association recommends no more than 300 mg of cholesterol per day. One study estimated, however, that reducing dietary cholesterol intake by 100 mg/day would only produce a 1% decrease in cholesterol levels. Avoiding foods high in cholesterol

will also not make much of a dent in high LDL levels. Eggs are also a good source of protein, are rich in very beneficial nutrients, and low in saturated fat. One study of people who ate eggs regularly indicated that certain people with high cholesterol experienced lower LDL levels and even a modest increase in HDL; people with high triglycerides appeared to fare badly. A 1998 study on rabbits suggested, however, that when cholesterol contained in food is heated, it becomes oxidized and accelerates atherosclerosis. Of note, one study indicates that although dietary cholesterol itself does not appear to increase the risk for heart disease in most people, people with diabetes, especially type 2, may be an exception. Until more research is done, they should consider avoiding eating eggs or other high-cholesterol foods (such as shrimp) more often than once a week.

## **Vitamins and Supplements**

**Antioxidant Vitamins and Supplements.** Currently, many researchers are studying vitamins C, E, and A and beta carotene and other nutrients for their role as antioxidants, which are scavengers of particles known as oxygen-free radicals. These unstable particles are by-products of many of the body's normal chemical processes and are increased by smoking, environmental toxins, and stress. They can damage cell membranes and interact with genetic material, contributing to the development of a number of disorders including cancer and heart disease.

Evidence for heart-protective benefits from vitamin E are stronger than other antioxidants. Although not all studies on vitamin E are positive, some experts believe that most are promising enough to recommend daily vitamin E supplements (400 to 80 IU) in patients with coronary artery disease. For example, laboratory studies have indicated that vitamin E has properties that inhibit blood clots and the formation of fatty plaques and cell proliferation on the walls of the arteries. Some studies have suggested that vitamin E may protect against ischemic stroke (caused by blocked arteries) and an animal study reported that high levels of vitamin E in the diet reduced the amount of brain tissue injured by a stroke. The evidence for heart protection from vitamin C is weaker. In two major studies that demonstrated some benefit from vitamin E, vitamin C was not protective. Vitamin C may help maintain blood vessel flexibility and so have benefits on blood pressure. One study found some benefits against stroke but not heart disease.

Of concern, however, are studies reporting that antioxidant supplements may actually be harmful in people with existing diseases, particularly cancer, since the same properties that protect healthy cells also may protect cancerous ones. In fact, there is some evidence that in high doses, vitamin C, vitamin E, and beta carotene have pro-oxidant effects that can be harmful. Beta carotene and vitamin A supplements in particular have no benefits for heart disease, and, in fact, a

number of studies are reporting a higher incidence in lung cancer in smokers in those who take them in supplement form.

Everyone should eat plenty of dark colored fresh fruits and vegetables, which contain teams of these and other antioxidant vitamins and nutrients.

**B Vitamins.** Niacin (Vitamin B3) is currently prescribed for lowering both LDL-cholesterol and triglyceride levels and for raising HDL levels. Although niacin is available over the counter, a physician should prescribe it in order to ensure its safety and effectiveness. Vitamins B6, B12, and folic acid are important in protecting against elevated blood levels of homocysteine, an amino acid that is a possible factor in coronary artery disease. However, it is not clear yet whether homocysteine is a cause or simply a marker of heart disease and it is not known if vitamin B supplements will actually reduce the risk of cardiovascular disease.

**Other Supplements.** One study indicated that calcium may protect against heart attack if it is obtained in products that do not contain fat (such as skim milk). Chromium, found in brewer's yeast, peanuts, whole grains, and dried beans, may boost HDL levels. Although supplements are not recommended at this time, the foods that contain chromium are. Supplements with L-arginine may help prevent atherosclerosis in people with high cholesterol, but more research is needed. Magnesium may possibly benefit both cholesterol levels and blood pressure and adequate amounts are critical for preventing excess calcium in the arteries, which can cause hardening of the endothelium (blood vessel lining).

### **Alcohol, Caffeine, and Chocolate**

**Alcohol:** Many studies have reported that alcohol increases HDL levels and may protect against heart disease and possibly stroke. Anyone on medication should ask their physician about potential interactions with alcohol. Women who are pregnant or have a risk for breast cancer should avoid alcohol to avoid the many hazards of excessive alcohol intake. Anyone at risk for alcohol abuse or alcoholism (this includes a family history of alcoholism) should absolutely never even consider using alcoholic beverages to help prevent heart disease! The average alcohol intake should be no more than two drinks a day for men and one drink a day for women (5 oz. of wine, 12 oz. of beer, or 1 1/2 oz. of spirits equals one drink).

**Caffeine:** Tea and Coffee. Tea may have a very positive effect on the heart. Although it contains caffeine, it also is rich in flavonoids and other substances that offer protection against damaging forms of LDL. Green tea is often cited for its health benefits but black tea may also be beneficial. In one study, higher intake of black tea, particularly by women, was associated with a reduced risk for severe coronary artery disease. Tea also contains folic acid, which reduces homocysteine levels, a possible factor in coronary artery disease.

Coffee did not appear to have any affect one way or the other, although drinking coffee increases excretion of calcium, which is important for bones and possibly for heart-health. Studies are finding that unfiltered coffee (Turkish coffee, Scandinavian boiled or French pressed coffee, and espresso) contains an alcohol called cafestol, which can raise cholesterol levels. Filtered coffee does not contain this residue. Of some concern is a study that reports high levels of homocysteine in people who drink many cups of coffee per day (decaf does not raise these levels). Homocysteine is a possible factor in coronary artery disease. On the other hand, coffee, like red wine, contains phenol, which helps prevent oxidation of LDL cholesterol. There is no evidence that drinking coffee increases the risk for heart disease, although tea is the better caffeine choice.

Chocolate. Chocolate contains stearic acid, which may lower LDL. Food containing chocolate, however, also contains sugar and fat, so it is not recommended for prevention.

## **Tables Of Recommended Foods**

### **FAT, OILS, AND DAIRY PRODUCTS**

#### **FATS AND OILS:**

**Choose:** Monounsaturated fats: canola, olive oils. Polyunsaturated fats: sunflower, soybean, corn, safflower, sesame oils.

**Commercial products:** trans-fatty-acid-free margarine, low-fat or fat-free salad dressing and mayonnaise, low- or no-fat sour cream, non-dairy creamers.

**Decrease or Eliminate:** Saturated fats: butter, cream, lard, bacon fat, shortening, animal fat drippings, stick margarine, and dressings and mayonnaise made with egg yolks and cream.

#### **MILK AND MILK PRODUCTS:**

**Choose:** Milk or yogurt products labeled skim, fat-free, no-fat, nonfat, zero-fat, low-fat or 1% fat milk. (2% fat milk products are not low fat; they have 25% less fat than whole milk and are considered reduced- or less-fat.)

**Decrease or Eliminate:** Whole dried, condensed, and evaporated milk, chocolate milk, cream, half-and-half, real or non-dairy whipped topping, custard style or whole milk yogurt, ice cream.

#### **CHEESE:**

**Choose:** Low-, or non-fat, hard cheese (3 to 5 grams of fat or less, and reduced sodium), low-fat cottage, pot, or farmer's cheese (1% or 2% milk fat), part-skim ricotta or mozzarella, light cream cheese, parmesan, or romano (2 Tbsp. limit).

**Note:** Except for low-fat cottage-type cheeses, most natural and processed hard cheeses, even many made from part-skim milk, are higher in saturated fats than lean meats.

**Decrease or Eliminate:** All whole milk cheeses (eg, brie, blue, Swiss, American, feta, mozzarella, cheddar, muenster, gouda, edam, havarti, camembert, Jarlsberg, roquefort, provolone), Welsh rarebit, processed cheeses (eg, cheese food and spreads) fondue, creamed cottage cheese.

**EGGS** [For information on eggs, see Dietary Cholesterol, above.]

## **COMPLEX CARBOHYDRATES**

### **BREADS:**

**Choose:** Any whole-grain sandwich bread, muffins, rolls, pita, tortillas (not fried) or crackers (low-fat and unsalted), especially rye or oat. Fiber content: 1 slice whole-wheat bread = 0.4 g soluble, 2.1 g insoluble fiber.

**Decrease or Eliminate:** White flour products, including bread, egg bagels and breads, croissants, sweet or buttered rolls, popovers, refrigerated dough, commercially prepared stuffing, muffins, doughnuts, sweet breads (eg, zucchini, banana, pumpkin), crackers with butter or cheese, cinnamon or chocolate graham crackers, taco shells, crackers made with coconut or palm oil or with more than 5 gm of fat per serving.

### **CEREALS AND WHOLE GRAINS:**

**Choose:** whole-grain side dishes, cereal, and flour products (eg, grits, oats, barley, cornmeal, millet, couscous, bulgar wheat, buckwheat groats, quinoa, flaxseed, meal), commercial dried cereals that are vitamin fortified, low-fat, low-sugar, low-sodium, and high in fiber; Fiber content: 1/3 cup uncooked oatmeal = 1.3 g soluble, 2.8 g insoluble fiber. 1 ounce corn flakes = 0.1 g soluble, 0.3 g insoluble fiber.

**Decrease or Eliminate:** Granola or any cereals with palm or coconut oils; instant cereals with more than 240 mg of sodium per serving.

### **PASTA:**

**Choose:** All types, preferably whole-grain and prepared with low-fat sauces; noodles made without egg yolks.

**Decrease or Eliminate:** Egg noodles; pasta prepared with butter, cream, high-fat cheese sauce or dried, commercial pasta sauce.

### **RICE AND DRIED BEANS:**

**Choose:** All types rice (preferably converted or brown), dried beans and peas, canned and cooked beans, tofu, refried beans, textured vegetable protein (TVP), hummus. Fiber content: 1/2 cup cooked kidney or pinto beans = 2 g soluble, 6.7 g insoluble fiber.

**Decrease or Eliminate:** Rice or beans with commercial, packaged sauces, baked pork and beans, canned chili con carne.

### **FRUITS AND VEGETABLES**

**VEGETABLES:** Vegetables (three or more daily servings): One serving = 1/2 cup cooked or 1 cup raw.

**Note:** some examples of fiber content are given below for one serving.

**Choose:** All fresh, frozen, canned (low sodium) vegetables, particularly dark green, yellow, or cruciferous vegetables (eg, broccoli, cabbage, cauliflower, Brussels sprouts); rinsed, canned vegetables, salsa, low-sodium vegetable juice, tomato paste, canned, low-sodium homemade soups, sun-dried tomatoes without added sodium, boiled and baked potatoes. Fiber examples: 1/2 cup cooked spinach = 0.5g soluble, 2.1 g insoluble fiber.

**Note:** Some veggie-burgers and veggie hot dogs are excellent and have no or are low in fat. Others, however, are quite high in fat, usually from soy or other vegetable oils, although it is rarely saturated fat. Labels should be read carefully. Unlike veggie burgers, veggie hot dogs provide almost no fiber.

**Cooking note:** Season vegetables with herbs, spices, lemon juice, or vinegar instead of cream sauces, salt, or butter. Low-fat yogurt blended with 3 to 4 tsp. cornstarch can substitute for heavy or sour cream.

**Decrease or Eliminate:** Deep fat-fried vegetables; canned vegetable juices and soups with sodium; commercially prepared soups made with cream or chunky meats; pickled vegetables, including sauerkraut and dill pickles; fried or instant mashed potatoes; vegetables cooked with cream and butter.

### **FRUITS:**

**Choose:** All fresh and frozen fruits and juices with very low or no added sugar, canned fruit in water or its own juice, dried fruit, rhubarb, avocado (1/8 of a fruit). Fiber example: 1 medium-sized apple = 1.2 g soluble, 3.6 g insoluble fiber.

**Note:** Grapefruit is a good source of fiber and two servings a day may even reduce cholesterol. It can interact with many medications, however, including increasing concentration of some cholesterol-lowering drugs and other drugs used for heart disease.

**Decrease or Eliminate:** Coconut, fruits canned in syrup, maraschino cherries, dried fruits with sodium preservatives.

## **PROTEIN**

### **FISH:**

**Choose:** Fresh or frozen fish, canned fish in water with reduced sodium, clams, scallops, lobster.

**Decrease or Eliminate:** Fried, smoked, or salted fish, oil-packed canned fish, canned sardines, squid, caviar, roe, imitation seafood (surimi), anchovies, oysters, crab.

**Note on shellfish:** Clams, oysters, mussels, and scallops are very high in fat and dietary cholesterol. Shrimp, lobster, and crab are low in fat, but high in cholesterol. In one study, shrimp did not raise cholesterol levels, although it did increase both LDL and HDL levels. Some studies indicate that shellfish are as protective as other fish for the heart.

**Note on cooking:** Cooking fish on the stove appears to breakdown beneficial omega-3 fatty acids; microwaving does not.

### **POULTRY:**

**Choose:** Chicken, turkey, rock Cornish hen, pheasant. Select breast meat over dark meat. Remove skin and trim fat. Baste with juice or wine instead of fat, drippings, or butter. Reduced-fat and sodium turkey and chicken cold cuts and frankfurters.

**Decrease or Eliminate:** Goose, duck, squab, capon, giblets, organ meat, canned chicken.

**Note:** A burger made from ground, skinless, turkey breast meat has less than 1 gram of fat and virtually no saturated fat. However, some packaged ground chicken or turkey may contain more fat than ground beef. Check labels or have the butcher grind the meat.

### **MEAT (EXCEPT POULTRY):**

**Choose:** Lean and Extra Lean Beef: eye of round, top round

Pork: Lean and Extra Lean tenderloin, sirloin, top loin.

Veal: shoulder, ground veal, cutlets, sirloin

Lamb: leg shank.

**Decrease or Eliminate:** Decrease: all good and choice cuts of beef, pork, ground beef (85% to 90% fat free), veal, lamb, venison, and rabbit products (no more than 1 to 2 times/ wk).

**Eliminate:** prime cuts, ground beef (less than 80% fat-free), fried meats, organ meat (organ meats are very high in cholesterol; brains have 2000 mg of chol. per 3.5 oz. ), all processed meat, including beef cold cuts, most frankfurters, luncheon meats, sausages, canned meats, and corned beef.

**Note:** When cooking ground meat for sauces and stews, rinse the meat with warm or hot water after browning. This removes fat, but does not affect the taste.

**Note:** Lean = less than 10 grams of fat and 4 grams of saturated fat per 3-oz serving. Extra lean = less than 5 grams of fat and 2 grams of saturated fat per 3-oz serving. Extra lean pork, for example, has a fat content equivalent to that of chicken.

**Note:** Reduced-fat beef hot dogs are now available, some with no measurable fat. Check labels carefully, however. Some are actually still quite high in fat.

## MISCELLANEOUS

### BEVERAGES (OTHER THAN FRUIT JUICE):

**Choose:** Fresh filtered tap water, soda water, club soda, flavored seltzers, sugar-free instant cocoa, mineral water, tea, or filtered coffee. [For information on alcohol, coffee, tea, and chocolate, see Alcohol, Caffeine, and Chocolate, above.]

Note: Diet sodas often contain high levels of sodium or other harmful substances and should be used in moderation and with careful monitoring of their sodium content.

**Decrease or Eliminate:** Eggnog, flavored or unfiltered coffee, baking cocoa.

### SEASONINGS AND SAUCES:

**Choose:** Herbs, peppers, garlic, vinegar, salt substitutes made from natural ingredients (unless on a potassium-restricted diet), mustard, chili powder and

chilies, reduced-sodium and fat barbecue sauce, cocktail sauce, Tabasco sauce, salsa, tomato paste or puree, and ketchup (limit 2 Tbsp.).

**Note on garlic:** Studies conflict on the benefits of garlic, but it contains allicin, which may affect cholesterol production, and lower blood pressure. Please use only fresh garlic to get these benefits

**Decrease or Eliminate:** Seasonings containing salt and MSG, including garlic and onion salts, soy sauce (reduced sodium and regular), Worcestershire sauce, canned cranberry sauce, curry sauce, dill sauce, gravy, hollandaise sauce, honey butter, creamy horseradish sauce, white and cream sauces, tartar sauce, peanut butter, guacamole, bacon bits, sweet pickle relish.

### **SNACKS:**

**Choose:** Air-popped popcorn without salt or fat, unsalted pretzels, baked tortilla chips.

**Note on nuts and seeds:** Unsalted nuts and seeds are proven to be very beneficial for cholesterol levels and heart health in general. Be Cautious - Nuts are very high in calories, however. Healthy nuts include chestnuts (the lowest), walnuts, peanuts, filberts, almonds, pecans, sunflower seeds, and pistachios.

**Decrease or Eliminate:** All products that list "hydrogenated" or "partially hydrogenated" oils on their labels. All fried chips, oil-popped or buttered popcorn, packaged chip dips, olives, salted nuts and seeds.

### **SWEETS:**

**Choose:** Jellies, jams, marmalade, syrup, molasses, honey, hard candies, angel food cake, frozen fruit bars, low-fat frozen desserts [e.g. yogurt], low- or non-fat muffins, cookies, and cakes (2 gm fat per serving or less).

**Note:** Sugar itself does not raise cholesterol, but sweets should be limited because they can lead to weight gain, another heart disease risk.

**Decrease or Eliminate:** Ice cream, commercially prepared cookies, mixes, pies, fruit crisps and cobblers; all deserts containing cheese, coconut, cream, or tropical oils; frappes, milkshakes, floats, eggnog, caramels, candy bars and chocolate candy.

### **EATING OUT:**

**Choose:** Asian and Indian restaurants usually have food available that is broiled or stir-fried and low in saturated fat. Be sure to ask. Many Asian restaurants will also prepare food without monosodium glutamate upon request. In Italian

restaurants, choose pastas with marinara sauce or those made from fresh vegetables.

**Decrease or Eliminate:** Avoid fast food burgers, tacos, and fried sandwiches (many fast food restaurants now offer salads and grilled chicken sandwiches); in all restaurants avoid egg dishes and menu items with the words buttery, deep-fried, breaded, with cream sauce, hollandaise, with gravy, au gratin, scalloped, béarnaise, or cheese sauce in them. Avoid frozen dinners of all kinds.

### **What Are Some Specific Dietary Approaches For Achieving A Healthy Heart?**

Currently, there is much controversy over the best balance of carbohydrates, fats, and protein. The three major cholesterol reduction diets are the following: the Step 1 and Step 2 diets recommended by the American Heart Association (AHA), the Mediterranean Diet, and very low-fat diets, such as the Ornish Program. Some experts believe that either the Step 1 or the Mediterranean diet is probably adequate for people with no coronary artery disease and normal LDL levels (no higher than 160 mg/dl) and for those with low LDL levels (130 mg/dl and below) with only one or two risk factors for heart disease, such as low HDL levels and smoking. For those with higher cholesterol levels, either the Step 2, Ornish, or Mediterranean diets may be effective depending on individual conditions. The high fat low carbohydrate Adkin's diet is another alternative. People who strictly adhere to it not only lose weight, but their cholesterol levels go down as they lose weight. Regular exercise is, of course, the most important component of any of these diets!

**The major questions concern fats:** how much and what kind. In general, most patients find it difficult to comply even with fat restrictions recommended under the Step 2 diet, which calls for fat intake being 20% of daily calories. The Ornish program is far stricter. Of some comfort was a study reporting that restricting fat intake only to 26% of calories reduced LDL levels as effectively as restricting fat intake to 18%. Indeed, experts are increasingly saying **that the type of fat is more important than the amount.** Low-fat diets, in fact, have been associated with a higher risk for stroke. The Mediterranean diet has great appeal, then, because of the foods allowed, including olive oil (rich in monounsaturated oil) and wine. However, **of great concern with any diet high in fats, even healthy ones, is the risk for weight gain**, and it is recommended only for people who are reasonably lean. A fourth heart-healthy diet is called the Dietary Approaches to Stop Hypertension (DASH) diet, which has been designed specifically to help people reduce blood pressure. Still another popular diet, the Atkins diet, severely restricts carbohydrates and substitutes protein.

Although all these dietary approaches differ in important aspects, they have some recommendations in common: all stress the value of fiber-rich whole grains, legumes, and fresh fruits and vegetables, and when fats are

recommended, they are monounsaturated and polyunsaturated. In choosing proteins, soy protein and fish should be emphasized over meat. Weight control and exercise are essential companions of any diet program. After embarking on a healthy diet, it generally takes an average of three to six months before a noticeable reduction in cholesterol occurs, although some people have reported better levels in as few as four weeks.

### **American Heart Association Diet Recommendations**

**The Step 1 diet** requires that daily fat intake represent less than 30% of calories, saturated fats less than 10%, and cholesterol intake less than 300 mg. (Simply switching to low-fat or skimmed milk may help people achieve the recommended dietary goal of 30% or fewer calories from fat and also help provide calcium.) Additionally, the daily diet of most people should consist of 50% to 65% complex carbohydrates, although this might be too high for some. A low-fat high fiber diet also appears to be safe and healthy for older children and adolescents as well.

**The Step 2 diet** is recommended for people with existing heart disease or unhealthy cholesterol levels. This diet requires that fat intake represent 20% of calories, saturated fats less than 7%, and a dietary cholesterol intake less than 200 mg. In general, the Step 2 diet provides modest benefits; in a review of a number of studies, the diet lowered cholesterol by only 6% after a year, probably because people failed to comply faithfully with it. Another study of people on the Step 2 diet, who were more closely monitored, reported a drop of 11% in LDL. Unfortunately, HDL levels also declined and lipoprotein(a) increased; both events are considered to have negative effects on the heart, although it is not clear what the implications are in such cases. Still another found no benefits in people at risk for coronary artery disease who used the Step 2 diet and also did not exercise. The Step 2 diet, in any case, has not been shown to reverse coronary artery disease. Some experts believe that it is too high in omega-6 fatty acids (found in many polyunsaturated oils) and too low in omega-3 (found in fish oils).

### **Mediterranean Diet**

The Mediterranean diet, with its emphasis on whole grains, fish, olive oil, garlic, and moderate, daily intake of wine, is rich in heart-healthy fiber and nutrients, including omega-3 fatty acids and antioxidants. Studies are increasingly reporting its health benefits. The diet calls for a relatively high fat intake (about 35% to 45% of daily calories), primarily composed of monounsaturated fats (MUFA). It recommends the same protein intake as the AHA, although fish is the primary source. Carbohydrate intake is reduced and emphasizes not only fresh fruits

and vegetables, but higher amounts of nuts, legumes, and beans than standard American recommendations. Nuts are proving to have particularly strong effects for improving cholesterol balances. In a study of heart attack patients, those on the Mediterranean diet had a 37% lower incidence of death, second heart

attacks, and symptoms of coronary artery disease than those who were on the Step 2 diet. A recent study reported that it significantly reduced the risk for a second heart attack after an average of four years compared to a conservative Western diet. Another reported that a MUFA-rich diet (using peanut oil) was better than the Step 2 American Heart Association diet in lowering total and LDL cholesterol and triglycerides and had no positive or negative effect on HDL levels. Triglyceride levels went up and HDL went down on the standard AHA diet. Other studies have reported lower stroke risks in diets high in monounsaturated fats. In one 2000 study, virgin olive oil, but not sunflower oil, was associated with lower blood pressure. (Olive oil itself may have beneficial components independent from its fatty acids.) Weight gain from the high intake of fats can be a problem with this diet, however, in anyone who has to watch calories. Other concerns with the Mediterranean diet are reduced iron levels and possible calcium loss resulting from consumption of fewer dairy products. People who use the diet should cook in iron pans and eat foods that contain iron or are rich in vitamin C, which aids in iron absorption. A calcium supplement may also be needed. Consuming wine may be a problem for some diabetics, for women who are pregnant or at risk for breast cancer, and for people prone to alcohol abuse.

### **The Ornish Program and Severely Fat-Restricted Diets**

For people with severe heart disease associated with cholesterol abnormalities who cannot or do not want to take cholesterol-lowering medications, the Ornish program may be the best option if they can maintain it. It is a very demanding regimen, however, that excludes all oils and animal products except nonfat yogurt, nonfat milk, and egg whites, limits saturated fats as much as possible, reduces total fat to 10%, and increases carbohydrates to 75% of calories. In addition to following strict dietary rules, people in the program exercise 90

minutes at least three times a week, use stress reduction techniques, do not smoke, and do not drink more than two ounces of alcohol per day. One study reported that after five years, people on the program experienced a 3.1% reduction in artery clogging, a 37.1% reduction in LDL, and less angina. In the same study, which compared the Step 2 diet with the low-fat Ornish program, those on the Step 2 diet were twice as likely to have an adverse heart event, including an attack, than those on the Ornish plan, even though 60% of Step 2 patients were on cholesterol-lowering medications and none of those on the Ornish plan were. The American Heart Association argues, however, that the Ornish program is so difficult to maintain that it will not benefit many people. The comparison study, in fact, was very small because few participants could sustain the efforts needed to fulfill the requirements of the Ornish program for five years. The AHA also argues that it is not clear what part or parts of the Ornish program were the effective components (diet, exercise, or stress reduction). In fact, a recent study reported that people on the Step 2 diet who also underwent a daily exercise program significantly reduced their LDL cholesterol levels while those who simply dieted or exercised did not. This indicates that perhaps any program

that includes both a healthy diet and exercise may be beneficial and that the diet does not have to be severe. Another study reported that for people with heart disease, no diet, even a very low fat one, reduced LDL levels to recommended levels without the addition of a cholesterol-lowering drug.

Some studies indicate that fat-restrictive diets may be harmful. Some have reported that high-carbohydrate and low-fat diets can reduce HDL levels and increase blood sugar and triglyceride levels. (In such cases, however, people may have chosen their carbohydrates primarily as simple sugars, not the complex carbohydrates found in whole grains and fresh fruits and vegetables.) Very low-fat diets may also increase the risk for stroke. Many people who reduce their fat intake may also not consume enough of the basic nutrients, including vitamins A and E, folic acid, calcium, iron, and zinc. People on low fat diets should consume a wide variety of foods and take a multivitamin if appropriate. Still, low-fat diets that are high in fiber, whole grains, legumes, and fresh produce offer health advantages in addition to their effects on cholesterol. They are effective in keeping weight off and they protect against high blood pressure and possibly against certain cancers.

### **The DASH Diet**

A diet known as Dietary Approaches to Stop Hypertension (DASH) is now recommended as an important step in managing blood pressure. It is low in saturated fat (although includes calcium-rich dairy products that are no- or low-fat) and rich in whole grains, fruits, and vegetables. (One recent study reported a reduced need for anti-hypertension medication in people with a high monounsaturated-fat diet.) The DASH diet includes a daily choice of nuts, seeds, or legumes and contains modest amounts of protein (preferably fish, poultry, or soy products). In one study, after eight weeks on the diet, subjects from a broad range of backgrounds experienced a significant reduction in blood pressure. This diet is not only rich in important nutrients and fiber but also includes foods that contain two and half times the amounts of electrolytes (potassium, calcium, and magnesium) as are found in the average American diet. Important foods include most fruits, many vegetables (especially, carrots, spinach, celery, alfalfa, mushrooms, lima beans, potatoes, avocados, broccoli), chicken, liver, and no-fat or low-fat milk. According to one study a low-calorie oat or wheat diet may significantly reduce blood pressure, however more work is needed to confirm these findings. Many of these foods are also high in fiber, which is protective against many diseases. It should be noted that grapefruit (but not other citrus fruits) boosts the effects of calcium channel blocking drugs used for hypertension. The long-term effect of the diet on the heart is unknown.

### **The Atkins Diet**

The Atkins diet is a program that severely restricts carbohydrates and substitutes protein. One study comparing low-protein versus high-protein diets, in which

protein substituted for carbohydrates, reported that the high-protein (22%) low-carbohydrate diet reduced total cholesterol, triglycerides, and LDL significantly compared to the low-protein (12%) high-carbohydrate diet. HDL remained the same. Fat content (35%) was the same in both diets. The long-term effects of high-protein diets are unknown, however, and for this reason **I support only short term, goal directed, use of the Adkins diet.** This is a diet that should only be undertaken with your physician's knowledge, and **the entire book should be read and understood before the diet is begun.** Because of the major metabolic changes your body will undergo, this is NOT a diet that you try, nor is it a diet you go on for a while and stop and then restart! It should be seen as a medical diet to reach a specific weight goal in a short specified period of time! It works great!

## **What Other Lifestyle Changes Should Accompany A Heart-Healthy**

### **Diet?**

### **Obesity and Weight Gain**

Obesity is associated with elevated total cholesterol and triglyceride levels and lower HDL levels. Even gradual increases in body fat may produce unhealthy cholesterol levels. One study found that an average increase of one pound of fat a year, as people aged, caused total cholesterol to rise and HDL levels to drop. The goals for a cholesterol-lowering diet then must also include attaining or maintaining a healthy weight.

### **Exercise**

A recent study reported that dietary changes improve cholesterol levels only when an aerobic exercise program is also included. In addition to having a beneficial effect on cholesterol, exercise is critical to maintaining a healthy heart; it helps keep weight off and lowers the heart rate and blood pressure. People who maintain an active lifestyle have a 45% lower risk of developing coronary heart disease than do sedentary people. Regular aerobic exercises, brisk walking, jogging, swimming, biking, aerobic dance, and racquet sports, are the best forms of exercise for lowering LDL and raising HDL levels. It may take up to a year of sustained exercise for HDL levels to show significant improvement. Experts recommend that people aim for a routine of 30-minute brisk walks most days of the week; an excellent goal is 20 to 25 miles a week, but in terms of raising HDL levels, more is better. Resistance (weight) training offers a complementary benefit by reducing LDL levels. After a high-fat meal, triglycerides can be lowered either with a single, prolonged (about 90 minutes) aerobic session or by several shorter sessions during the day. One study indicated, however, that short-bursts of exercise actually increase LDL oxidation, the process that makes LDL dangerous to the heart, so individuals should always aim for a consistent, regular program. Before engaging in any strenuous

exercise, it is advisable to consult a physician. Children should especially be encouraged to exercise every day.

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