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# Cholesterol and fats

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## Quick Facts

Fats and cholesterol can help keep our bodies healthy or promote disease. The amounts, types and one's family history are the key.

There are three types of fat: saturated, monounsaturated and polyunsaturated.

Fats and cholesterol can affect blood cholesterol levels.

An elevated blood cholesterol level is a risk factor for heart disease.

Cholesterol and fats in food are sometimes easy to see and sometimes less visible.

Most Americans eat too much fat.

To reduce dietary fat and cholesterol change eating habits, shop carefully, read labels, modify recipes, and reduce portion sizes. These changes usually are easier and more permanent if made slowly.

## Cholesterol

**What is cholesterol?** Cholesterol is a waxy fat-like substance found in all animals including people. It is an essential part of cells in the body and used to make certain hormones and digest fats.

**Is it harmful?** Cholesterol is necessary for a healthy body and by itself is not harmful. A high level of cholesterol in one's blood is a definite risk factor of heart disease. The higher the level, the greater the risk. According to the *1987 Report of the National Cholesterol Education Program Adult Treatment Panel*, total blood cholesterol of:

< 200 mg/dl is desirable blood cholesterol;
200-239 mg/dl is borderline-high blood cholesterol;
≥ 240 mg/dl is considered to be high blood cholesterol.

Other risk factors such as age, sex, family history, smoking, hypertension, diabetes, severe obesity, and low HDL-cholesterol concentration (see below) should be considered when determining your total risk.

**Is all blood cholesterol the same?** The chemical substance is the same, however, it is transported in the blood by different types of carrier particles. The relative amounts of cholesterol transported by each of these carriers can affect the risk of heart disease. The two major types of blood cholesterol carrier are LDL and HDL.

| | LDL | HDL |
|---|---|---|
| Full Name: | Low Density Lipoprotein | High Density Lipoprotein |
| What it does: | takes cholesterol from the liver to the rest of the body | primarily takes cholesterol from body tissue back to liver |
| Effect on risk of heart disease: | excess amounts *increases* risk | high amounts *reduces* risk |
| Nickname: | "bad" cholesterol | "good" cholesterol |

**Where do we get cholesterol?** Our bodies can make all of our cholesterol, but most people also get it from foods. Different foods vary in the amount of cholesterol they contain. Only animal products have cholesterol, plants do not. See the following tables.

## Fats

**Is eating fat unhealthy?** *Eating some fat* is necessary. It is an important source of concentrated energy with more than twice the calories per ounce than sugar, starch or protein. Fats aid in carrying fat soluble vitamins A, D, E and K. In addition, a specific type of fat found in plants is essential for proper functioning of our bodies. Fats also can make food taste better, aid in cooking, and help keep the hunger pangs away.

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*Eating too much fat* may lead to obesity, which is unhealthy. It also may increase the risk of heart disease and some forms of cancer.

**Are all fats the same?** Most fats found in nature are a combination of three basic types of fat with different chemistry: saturated, monounsaturated and polyunsaturated. "Saturated" means the fat has as many hydrogen atoms as possible. This usually makes saturated fats firm or solid at room temperature. Saturated fats primarily come from animal products but also are found in tropical plants such as coconut and palm. Monounsaturated fats are missing a few possible hydrogen atoms and are oils (liquid at room temperature). These primarily come from plants, most commonly from peanuts or olives. Lard also contains a lot of monounsaturates as well. Polyunsaturated fats, or oils, are missing several or many hydrogen atoms. Many common vegetable oils, such as corn, soy bean, canola, safflower and sunflower oil are high in polyunsaturated fats. Hydrogen atoms can be added to oils to make them more solid. This process, called hydrogenation, allows vegetable oils to be made into margarine and shortening.

## Fats and Cholesterol

**How are fats related to blood cholesterol?** Scientific evidence indicates that the amount and type of dietary fat can affect blood cholesterol. Eating less fat, especially saturated fats, has been found to lower blood cholesterol levels. Replacing some saturated fats with polyunsaturated and monounsaturated (especially olive oil) also can be helpful in lowering blood cholesterol levels. Dietary cholesterol also can raise blood cholesterol but generally is not as important as saturated fat and total fat in the diet. Remember, high blood cholesterol levels increase risk of heart disease while lower blood cholesterol reduces risk.

**How much fat and cholesterol is too much?** Frequently, recommendations for fat are given in percentage of calories from fat or fat calories. Currently, the average American gets about 40 percent of total calories from fat. Most medical experts think this is too much. The *U.S. Dietary Guidelines* advise a general reduction in fat (especially saturated fat) and cholesterol. The American Heart Association recommends for the general public:

**Total fat:** no more than 30 percent of calories from fat; **saturated fat:** no more than 10 percent of calories; **monounsaturated:** no more than 10 percent of calories; **polyunsaturated:** no more than 10 percent of calories; **cholesterol:** no more than 300 mg per day.

These recommendations are the same as in Step 1 of dietary treatment for reducing blood cholesterol made by the National Cholesterol Education Program Adult Treatment Panel. Step 2 calls for further restriction:

**Saturated fat:** no more than 7 percent of calories; **Cholesterol:** no more than 200 mg per day.

Diet therapy may not be enough for some people with high risk. For most people, however, diet therapy should be continued at least six months before deciding whether to add drug treatment.

According to the American Academy of Pediatrics, optimal fat intake for children is unknown, however, 30 to 40 percent of calories from fat seems sensible for adequate growth and development in children.

**How much fat is that really?** A teaspoon of fat contains about 45 calories and 5 grams. The number of teaspoons of fat that are prudent depends on how many calories you eat.

**In what foods are fats and cholesterol found?** In some foods fats are obvious such as in noticeably greasy, fried or oily foods. In other foods, they are more invisible. Cholesterol in foods comes from animal products, but has no tell-tale signs. It is not found in food products made from plants. A food can be high in fat and cholesterol (fried egg), high in fat but low in cholesterol (peanut butter), low in fat and high in cholesterol (shrimp) or low in both (fruit).

**What about fish and fish oil supplements?** Diets containing lots of fish have been linked with reduced risk of heart disease. The effectiveness and safety of fish oils has yet to be proven. Therefore, eating fish is encouraged, but the use of fish oil supplements is not currently recommended by the American Heart Association.

## Reducing Fat and Cholesterol

There are several things you can do to reduce the amount of fat and cholesterol you eat.

**1. Change your eating habits.**

| Eat more: | Eat less: |
|---|---|
| Vegetables | Fried foods |
| Lean meats, fish, poultry | Fatty & processed meats: |
| Vegetable protein sources | lunch meats |
| such as: | bacon |
| peas | hot dogs |
| lentils | sausage |
| beans | Desserts high in fat such as: |
| grains | ice cream |
| Breads & cereals | pastries |
| Fruit for dessert and | pies |
| snacks | cheesecake |

**2. Read labels and shop carefully.** Labels can provide helpful information and often not only give calories/serving but also grams of fat. Grams of fat can be used in comparing items and making good choices.

Hints for evaluating grams of fat on labels:

| For entrees | For snacks, desserts or side dishes | Fat content |
|---|---|---|
| 0-9 gms of fat | 0-4 gms of fat | low |
| 10-15 gms of fat | 5-6 gms of fat | medium |
| > 15 gms of fat | > 6 gms of fat | high |

It is also possible to convert grams of fat into percentage of calories from fat by the following formula:

$$\frac{\text{grams of fat on label} \times \text{9 calories/gram of fat}}{\text{total calories}} \times 100\% = \text{percent calories from fat}$$

Beware, a % sign on labels may be misleading; 2% milk does NOT mean that only 2 percent of the calories from the milk comes from fat. The given percentage is based on weight rather than

on calories. Much of the weight of milk is water that contains no calories. Therefore, the percent based on weight will be lower than the percent based on calories.

Two percent milk has approximately 5 grams of fat or 1 teaspoon per cup.

Using the formula:

$$\frac{5 \text{ grams} \times 9 \text{ calories/gram}}{120 \text{ calories}} \times 100\% = 37.5\% \text{ fat calories}$$

The same is true when you buy meats.

73% ground beef (broiled, well) = 61% calories from fat.

80% ground beef (broiled, well) = 55% calories from fat.

85% ground beef (broiled, well) = 50% calories from fat.

95% lean ham (cooked) = 30% calories from fat.

(NOTE: The diet should be evaluated as a whole. The percent of calories from fat for the entire diet is more important than the percentage of fat from an individual food.)

When shopping buy foods:

| with less fat: | instead of those with more fat: |
|---|---|
| Hamburger with deep color or labeled "lean" | Hamburger with light pink color or labeled "reg." |
| Least fatty grades of meat | Heavily marbled beef |
| Non-fat, 1%, or 2% milk | Whole milk |
| Non fat dry milk | Non-dairy coffee creamer |
| Tuna packed in water | Tuna packed in oil |

**3. Learn the meaty facts.** It is true that fat and cholesterol often are found in meats, but meats can provide many important nutrients. Many people think chicken and fish are healthier than red meat, however, with careful selection and preparation red meats can be low in fat and included in a healthy-heart diet. Remember, chicken and fish, which often are low fat choices, also can be prepared so they are higher in fat than lean beef or pork. Dark meat poultry has more fat than white meat and keeping the skin on chicken and/or frying adds more fat. It is what you buy at the store and how you cook the food that makes the difference.

To reduce meat fats:

- Cut off all visible fat.
- Thoroughly drain fat off all cooked meats.
- Cook stew and other precooked meats a day ahead of time. Remove the hardened fat from the top before reheating, or making chili, stew or soups.
- Baste with wine, tomato juice or boullion instead of drippings.
- Broil rather than pan-fry meats, such as hamburger, chops and steak.
- Remove skin from chicken.
- Buy lean meats.

Examples of lean meat choices:

**Beef**—round steak, rump roast, top ground steak and roast, tip steak and roast, lean cubed steak, top loin steak, tenderloin steak, flank, sirloin, ground beef, lean or extra lean.

**Pork**—leg roast (fresh ham), leg steak, lean pork cutlets, center rib chop and roast, butterfly chop, sirloin roast, tenderloin, tenderloin roast, ground pork, lean or extra lean, lean shoulder cubes.

**Lamb**—leg, loin chops.

**4. Change recipes to reduce fats.** Many favorite recipes still can be used in the context of a diet reduced in fat.

- Try cutting oil or fat in half. You usually can't tell the difference.
- Use lean meats in recipes.
- In casseroles, use more vegetables and less meat and be careful with the sauces.
- Use low fat alternatives for sour cream, mayonnaise, and whipping cream such as non-fat yogurt or whipped topping made from skim milk.
- Use 2 egg whites instead of 1 yolk.

**5. Watch portion sizes.** Moderation is the key. For example, a lean 3-ounce meat portion, provides you with the nutrients you need. A piece of meat one-half inch thick that fits on the palm of a woman's hand is about a 3-ounce portion. Don't eliminate, cut down. Eat high-fat food less often and in small portions.

**6. Aim for slow steady progress.** Try one or two tips for reducing fat at a time. With slow steady progress, you will be successful.

**Table 1: Polyunsaturated, monounsaturated and saturated fats.**

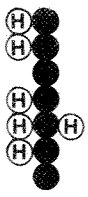
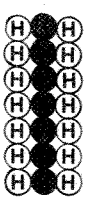
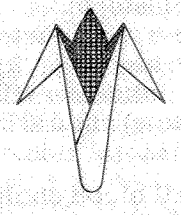
| | **Polyunsaturated** fats (oils) are missing many hydrogen atoms. | **Monounsaturated** fats (oils) are missing some hydrogen atoms. | **Saturated** fats are those that are filled up with hydrogen. |
|---|---|---|---|
| Different fats have different amounts of hydrogen: |  |  |  |
| How they affect our health: | In some people, polyunsaturates tend to **lower** blood cholesterol. | Some evidence suggests that monounsaturates lower blood cholesterol. | In some people, saturates tend to **raise** blood cholesterol. |
| | cholesterol  |  |  cholesterol |

**Table 1: Polyunsaturated, monounsaturated and saturated fats. Continued.**

| | Polyunsaturated | Monounsaturated | Saturated |
|---|---|---|---|
| At room temperature: | Polyunsaturated and monounsaturated fats are liquid (so we call them oils) | | Saturated fats are usually solid or firm |
| Where they come from: | *Mostly from plants* | *Mostly from plants* | *Mostly from animals* |
| Examples: | Safflower oil<br>Corn oil<br>Sunflower oil<br>Soybean oil<br>Cottonseed oil<br>Sesame oil | Olive oil<br>Peanut oil | Fat in meat<br>Butter<br>Lard<br>Cheese<br>Whole milk<br>Cream<br>*But also some from plants*<br>Coconut oil<br>Palm oil<br>Cocoa butter (in chocolate)<br>Hydrogenated vegetable oil |



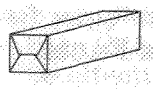


**Table 2: Eating 30 percent of calories from fat daily.**

| Who would usually eat | Total calories | Calories from fat | Grams of fat | Teaspoons of fat* |
|---|---|---|---|---|
| Male athlete | 3000-4000 | 900-1200 | 100-133 | 20-27 |
| Active adult male | 2500-3000 | 750-900 | 83-100 | 17-20 |
| Adult male or active female | 2000-2500 | 600-750 | 67-83 | 13-17 |
| Adult female or elderly male | 1500-2000 | 450-600 | 50-67 | 10-13 |
| "Dieting" adult or elderly female | 1000-1500 | 300-450 | 33-50 | 6-10 |

**Fats do not always come in teaspoons but all fat must be counted in what you eat each day. For example, the fat in a hot dog cannot be measured with a teaspoon, but may be a big source of fat contributing 3 teaspoons per 2 ounces hot dog.*

**Table 3: Spotting hard to see fats and cholesterol in foods.**

| Category, Food, Serving Size | Gm fat/ serving | Cholesterol (mg/dl) |
|---|---|---|
| **Dairy** | | |
| Ice cream, 1 c. | 14 | 59 |
| Egg, cooked | 6 | 274 |
| Cheddar cheese, 1 oz. | 9 | 30 |
| Swiss cheese, 1 oz. | 8 | 26 |
| Cream cheese, 1 Tbsp. | 6 | 31 |
| Sour cream, 1 Tbsp. | 2 | 5 |
| **Meat** | | |
| Regular ground beef, 1 patty, cooked | 16 | 92 |
| Luncheon meats, 1 slice | 7 | 13 |
| Hot dogs, 1 | 15 | 35 |
| Chicken leg w/skin | 15 | 105 |
| Tuna in oil, 1 can | 14 | 30 |
| **Nuts and seeds** | | |
| Peanut butter, 1 Tbsp. | 8 | 0 |
| Peanuts, 10 nuts | 5 | 0 |
| Sunflower seeds, 1 Tbsp. | 4 | 0 |
| Nuts (walnuts, almonds, etc.) 1/8 c. avg. | 10 | 0 |
| **Baked goods** | | |
| Doughnut, 1 glazed | 10 | 11 |
| Apple pie, 1 slice | 13 | 13 |
| Brownies, 1 square | 5 | 13 |
| Macaroon cookies, 2 | 2 | 42 |
| **Candy** | | |
| Chocolate, 1 oz. | 10 | 0 |
| **Other** | | |
| Mayonnaise, 1 Tbsp. | 11 | 8 |
| Olives, 5 giant size | 5 | 0 |

*Source: Composition of Foods, Agriculture Handbook 8, USDA*