HEALTH

Cholesterol and Fats no. 9.319

by J. Anderson [1]

Quick Facts...

Fats and cholesterol can help keep our bodies healthy or they can promote disease. The amounts, types and 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.

Most Americans eat too much fat.

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 is used to make certain hormones and digest fats.

Is it harmful? Cholesterol is necessary for a healthy body. By itself, it is not harmful. However, a high level of cholesterol in blood is a definite risk factor for heart disease. The higher the level, the greater the risk. According to the *1993 Report of the National Cholesterol Education Program Adult Treatment Panel*, total blood cholesterol of:

- 200 mg/dl or less is a desirable blood cholesterol level.
- 200 to 239 mg/dl is borderline-high blood cholesterol.
- 240 mg/dl or more is considered to be high blood cholesterol.

When determining your total risk, consider other risk factors such as age, gender, family history, smoking, hypertension, diabetes, severe obesity and low HDL-cholesterol concentration (see below).

Is all blood cholesterol the same? The chemical substance is the same. However, it is transported in the blood by different carriers. The relative amounts of cholesterol transported by each carrier can affect the risk of heart disease. The two major blood cholesterol carriers are LDL and HDL (see Table 1).

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 Tables 2 and 4.

Table 1: Characteristics of HDL and LDL.

	LDL	HDL
Full Name:	**L**ow **D**ensity **L**ipoprotein.	**H**igh **D**ensity **L**ipoprotein.
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 **increase** risk.	High amounts **reduce** risk.
Nickname:	“Bad” cholesterol.	“Good” cholesterol.

Fats

Is eating fat unhealthy? Eating some fat is necessary. It is an important source of concentrated energy — it has more than twice as many calories per ounce as sugar, starch or protein. Fats help carry 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 can also make food taste better, aid in cooking, and help keep the hunger pangs away.

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Here is a sample nutrition label seen on foods:

Spinach Souffle
Nutrition Facts

Serving Size ½ cup
Servings Per Container 3

Amount Per Serving

Calories 150 Calories from Fat 90

	% Daily Value*
Total Fat 10g	**15**%
Saturated Fat 2g	**10**%
Cholesterol 120mg	**38**%
Sodium 480mg	**19**%
Total Carbohydrate 9g	3%
Dietary Fiber 0g	**12**%
Sugars 4g	
Protein 6g	

Vitamin A 35% • Vitamin C 2%

Calcium 10% • Iron 4%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrates			
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

This label tells you that this spinach souffle provides 10 g total fat in a half cup serving. This is 15% of the Daily Value for total fat, based on a 2,000-calorie diet: 10 grams fat / 65 g total fat in a 2,000-calorie diet = 15%. (See fact sheet 9.365, The New Food Label*).*

Evaluate your diet 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.

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 hydrogen atoms. They are oils (liquid at room temperature). These primarily come from plants. Oils high in monounsaturated fats include canola, peanut and olive. Lard also contains a lot of monounsaturates as well.

Polyunsaturated fats, also oils, are missing several or many hydrogen atoms. Many common vegetable oils, such as corn, soybean, 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 fats (especially olive and canola oil) also can help lower blood cholesterol. Dietary cholesterol 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 levels reduce 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 34 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 the following 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:** 10 to 15 percent of calories;
- **Polyunsaturated:** no more than 10 percent of calories; and
- **Cholesterol:** no more than 300 mg per day.

These recommendations are the same as Step 1 of the 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; and
- **Cholesterol:** no more than 200 mg per day.

Diet therapy may not be enough for some people with high risk. Most people, however, continue diet therapy 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 percent of calories from fat seems sensible for adequate growth and development in children, especially after the age of two.

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

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

Change your eating habits:

Eat more:

- *Vegetables*
- *Fruits*
- *Lean meats, fish, poultry*
- *Vegetable protein — peas, lentils, beans, grains*
- *Breads, cereals, pasta and white grains*
- *Fruit for dessert and snacks*

Eat less:

- *Fried foods*
- *Fatty and processed meats — lunch meats, bacon, hot dogs, sausage*
- *Desserts high in fat — ice cream, pastries, pies, cheesecake*

The following terms describe products that help reduce intake of fat:

Low fat:
3 grams or less per serving.

Low saturated fat:
1 gram or less per serving.

Low cholesterol:
Less than 20 mg cholesterol per serving.

Low calorie:
40 calories or less per serving. Synonyms for low include "little," "few" and "low source of."

Lean:
Less than 10 grams fat, less than 4 grams saturated fat, and less than 95 mg cholesterol per serving and per 100 grams.

Extra lean:
Less than 5 grams fat, less than 2 grams saturated fat, and less than 95 mg cholesterol per serving and per 100 grams.

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more invisible. Cholesterol 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 high in fish have been linked to reduced risk of heart disease. The effectiveness and safety of fish oils has yet to be proven. While eating fish is encouraged, the use of fish oil supplements is not currently recommended by the American Heart Association.

Reducing Fat and Cholesterol

Read labels and shop carefully. The new food label provides the necessary information to help consumers meet the American Heart Association's and the USDA/Health and Human Services' Dietary Guidelines. Nutrition labels list the Daily Reference Values (DRV) for specific nutrients, including fat, saturated fat and cholesterol. The DRV for fat is 65 g, for saturated fat 20 g, and for cholesterol 300 mg.

Specific health claims can be made for food products that meet certain requirements. For example, "While many factors affect heart disease, diets low in saturated fat and cholesterol may reduce the risk of this disease." In order to make a health claim about heart disease and fats, the food must be low in fat, saturated fat and cholesterol. Terms "lean" and "extra lean" can be used to describe the fat content of meat, poultry, seafood and game meats if certain standards are met.

Products that have "percent fat free" claims must accurately reflect the amount of fat present in 100 grams of the food. "Percent fat free" products must meet the low fat or fat free product definitions. For example, if a product contains 2.5 grams of fat per 50 grams, the claim must be "95% fat free."

The one exception is liquid milk. Two percent (2%) milk has approximately 5 grams of fat or 1 teaspoon per cup. Converting grams of fat into percent of calories from fat, 2% milk has 37.5% fat calories [(5 g x 9 calories/g) / 120 calories] x 100% = 37.5%.

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, can be prepared so they are higher in fat than lean beef or pork. Dark meat poultry has more fat than white meat. Keeping the skin on chicken or frying it adds more fat. What you buy at the store and how you cook the food makes the difference.

To reduce meat fats:

- Cut off all visible fat.
- Thoroughly drain fat off all cooked meats.
- Cook stew and other 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 bouillon instead of drippings.
- Broil rather than pan-fry meats, such as hamburger, chops and steak.
- Remove skin from chicken.
- Buy lean or extra 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.

When shopping, buy foods:
with less fat:

- *Hamburger with deep color or labeled "lean"*
- *Least fatty grades of meat*
- *Nonfat, 1%, or 2% milk*
- *Nonfat dry milk*
- *Tuna packed in water*

instead of those with more fat:

- *Hamburger with light pink color or labeled "regular"*
- *Heavily marbled beef*
- *Whole milk*
- *Nondairy coffee creamer*
- *Tuna packed in oil*

Change recipes to reduce fats. Many favorite recipes can still be used in a reduced-fat diet.

- 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 nonfat yogurt or whipped topping made from skim milk.
- Use two egg whites instead of one yolk.

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 the size of a deck of cards is about a 3-ounce portion. Don't eliminate — just cut down. Eat high-fat food less often and in small portions.

Table 2: Polyunsaturated, monounsaturated and saturated fats.

	Polyunsaturated (fats, oils)	Monounsaturated (fats, oils)	Saturated (fats)
Amounts of hydrogen	Missing many hydrogen atoms.	Missing some hydrogen atoms.	Filled up with hydrogen.
How they affect our health	Can lower blood cholesterol, may lower HDL.	Lowers blood cholesterol but not HDL.	Can raise blood cholesterol.
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: safflower oil, corn oil, soybean oil, cottonseed oil, sesame oil	Mostly from plants: olive oil, peanut oil, canola oil	Mostly from animals: fat in meat, butter, lard, cheese, whole milk, cream. Some from plants: coconut oil, palm oil, cocoa butter (in chocolate), hydrogenated vegetable oil

Table 3: Eating 30 percent of calories from fat.

Who	Total calories	Calories from fat	Grams of fat	Tsp fat
Male athlete	3,000-4,000	900-1,200	100-133	20-27
Active adult male	2,500-3,000	750-900	83-100	17-20
Adult male or active female	2,000-2,500	600-750	67-83	13-17
Adult female or elderly male	1,500-2,000	450-600	50-67	10-13
Dieting adult or elderly female	1,000-1,500	300-450	33-50	6-10

Table 4: Spotting hard to see fats and cholesterol in foods.

Category, food	Serving size	Grams fat per serving	Cholesterol (mg/dl)
Dairy			
ice cream	1 cup	14	59
egg, cooked	1	6	213
cheddar cheese	1 oz.	9	30
Meat			
regular ground beef, cooked	1 patty	16	92
hot dogs	1	15	35
chicken leg w/skin	1	15	105
Nuts and seeds			
peanut butter	1 Tbsp.	8	0
Baked goods			
doughnut, glazed	1	10	11
brownies	1 square	5	13
Candy			
chocolate	1 oz.	10	11
Other			
olives, giant size	5	5	0

* 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 it may be a big source of fat, contributing 3 teaspoons per 2 ounces of hot dog.