

# CHOLESTEROL CLUES



**SOLVING THE PUZZLE OF  
CHOLESTEROL AND HEALTHY EATING**



CANADIAN EGG  
MARKETING AGENCY

Your body needs cholesterol.

The amount and type of cholesterol in your blood can affect your risk of heart disease. You can help control the cholesterol in your blood with healthy eating.



## WHAT IS CHOLESTEROL?

Cholesterol is a natural substance found in animals, including humans. Your body needs cholesterol to make hormones, vitamin D and bile. Cholesterol is part of the membranes around your cells.

Cholesterol is found in foods from animals, such as meat, fish, poultry, egg yolks and milk products. Plant foods, such as vegetables, nuts, fruits and grains do not contain cholesterol.

You get only a small amount of cholesterol from the food you eat. Your liver makes more to meet your body's needs.



*Bile is made by the liver and helps your body digest and absorb fats.*

## WHAT IS “GOOD” CHOLESTEROL AND “BAD” CHOLESTEROL?

“Good” and “bad” refer to types of cholesterol found in your blood. Your blood carries cholesterol to reach your cells where it is needed. Cholesterol is carried in packages called lipoproteins.

**High-density lipoprotein (HDL)** takes excess cholesterol away from your body’s cells to the liver for disposal. **HDL cholesterol** is called “good” cholesterol because **high** levels in your blood can **decrease** your risk of heart disease.

**Low-density lipoprotein (LDL)** takes the cholesterol to your body’s cells. **LDL cholesterol** is called “bad” cholesterol because **high** levels in your blood can **increase** your risk of heart disease.

## HOW DOES BLOOD CHOLESTEROL AFFECT HEART DISEASE?

Some cholesterol from LDL attaches to the inner walls of arteries, forming mounds called plaques. As plaques get larger, they gradually make the passageway in the arteries narrower. Small clots often form in the blood. These clots may get larger and stick to the narrowed arteries, blocking the blood flow. A higher amount of LDL cholesterol in your blood may lead to more plaques in your arteries.

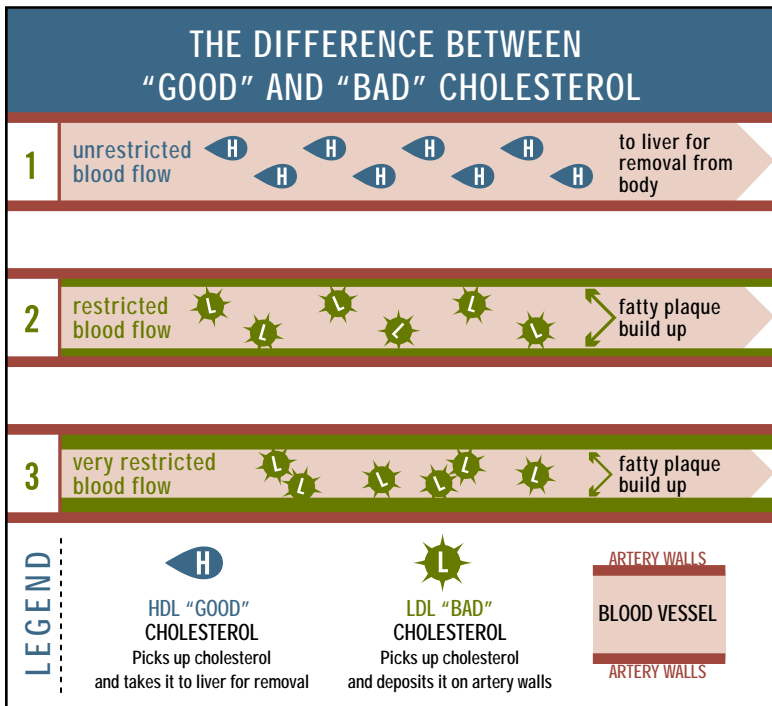


*Lipoproteins are clusters of fats, cholesterol and protein that travel through the blood.*



*Arteries are vessels that carry the blood that is pumped by your heart to other parts of the body, including the heart muscle itself.*





HDL picks up extra cholesterol and takes it to the liver to be removed from your body. This prevents cholesterol from adding to the plaques on the artery walls.

A heart attack results when blood flow in a major artery to the heart is blocked. A stroke results when blood can't reach a part of the brain. Your risk of a heart attack or stroke is lower if you keep your arteries clear.

Your risk of heart disease increases if:

- your LDL cholesterol is high and/or
- your HDL cholesterol is low.

## How can I find out my risk of heart disease from blood cholesterol?

Tests for blood cholesterol can determine the total amount of cholesterol carried in your blood, as well as the amount of the two types of lipoprotein packages (HDL and LDL). The Canadian Medical Association suggests that men over 40 years and women over 50 years be tested for total, LDL and HDL cholesterol<sup>1</sup>. Your doctor can assess the amount of HDL (good) cholesterol and LDL (bad) cholesterol as part of your overall health assessment.

Blood cholesterol is only one factor that can affect your risk of heart disease. Many factors affect the amount and type of cholesterol found in your blood. Researchers are still trying to find out how all the factors fit into the heart disease puzzle.

## WHAT FACTORS CAN AFFECT YOUR BLOOD CHOLESTEROL LEVEL?

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Factors that can affect your blood cholesterol level include:

- family history
- age and gender
- diabetes mellitus
- body weight and shape
- level of physical activity
- eating habits

### Family history

If one of your parents or grandparents had an early heart attack (before 55 years for men or before 65 years for women), you may be at higher risk of a heart attack or stroke due to your blood cholesterol level.

<sup>1</sup> Fodor JG et al. 2000. Recommendations for the management and treatment of dyslipidemia. Can Med Assoc J 162(10)1441-7.

Talk to your doctor about your blood cholesterol levels and other ways of lowering your risk of heart disease.

### Age and gender

LDL cholesterol tends to increase as you get older. Until age 45, men tend to have a higher LDL cholesterol level than women. At menopause, women's risk tends to increase as LDL cholesterol rises and HDL cholesterol declines.



*Diabetes Mellitus is a disorder in which insulin (a hormone that regulates blood sugar level) is lacking or not working well.*

### Diabetes Mellitus

Uncontrolled diabetes tends to raise LDL cholesterol and lower HDL cholesterol. Successful treatment of diabetes can improve cholesterol levels and slow damage to the arteries.

### Body weight and shape

People with excess body fat, especially around the waist and abdomen, often have higher LDL and lower HDL cholesterol. These values can improve with small amounts of weight loss.

### Level of physical activity

Physical activity raises HDL cholesterol. A healthy lifestyle of physical activity and proper eating habits can improve your blood cholesterol levels.

### Eating habits

Your eating habits affect your HDL and LDL cholesterol levels. No **single** food can cause or solve a blood cholesterol problem. Fats, dietary cholesterol and soluble fibre can affect your blood cholesterol levels in many different ways.

## FATS

Foods have a mixture of different types of fat, including saturated, monounsaturated, polyunsaturated, omega-3 and *trans* fats. Each type can affect blood cholesterol. For more information about fat in your diet, see *Bringing Fats into Focus*, a booklet developed by the Canadian Egg Marketing Agency, which is available from your provincial egg marketing board.

### Saturated fats

Eating saturated fats raises LDL cholesterol. Saturated fats are usually solid at room temperature.

#### *Saturated fats are found in:*

- many pre-packaged foods (cookies, crackers, potato chips)
- whipped toppings
- many baked goods (croissants, cakes, danishes)
- processed foods made with lard, palm oil or coconut oil

### Unsaturated fats

Monounsaturated and polyunsaturated fats are considered unsaturated fats. They are usually liquid at room temperature.

Eating **monounsaturated** and **polyunsaturated** fats helps to lower LDL cholesterol.

#### *Monounsaturated fats are found in:*

- peanuts and almonds
- olive, canola and peanut oils
- soft margarine made from these oils

#### *Polyunsaturated fats are found in:*

- nuts and seeds
- liquid oils such as corn, soybean, sunflower, safflower and sesame oils
- soft margarine made from these oils



Some polyunsaturated fats are called **essential fatty acids** because your body needs them for growth and development and to maintain health. A healthy, balanced dietary intake includes polyunsaturated fats.

**Omega-3 fats** are one type of polyunsaturated fats that may help to reduce your risk of heart disease by improving blood pressure and reducing blood clotting.

*Omega-3 fats are found in:*

- fish, such as salmon, sardines, trout and tuna
- nuts and seeds, such as walnuts, flax seed and soybeans
- oils, such as canola and soybean
- omega-3 enriched eggs, from chickens fed a special diet high in flaxseed



*Trans fats are formed when hydrogen is added to polyunsaturated fatty acids. This process is called hydrogenation.*

**Trans fats**

Eating *trans* fats raises LDL cholesterol and tends to lower HDL cholesterol.

*Trans fats are found in:*

- baked goods
- packaged snack foods
- deep-fried foods
- margarine containing hydrogenated oil

Saturated and *trans* fats are the most important dietary factors that raise LDL cholesterol. Reducing these fats in your diet helps to prevent damage to artery walls.

**If you reduce total fat intake, you will reduce your intake of saturated and *trans* fats.**

## Dietary cholesterol

Eating cholesterol in food has little effect on blood cholesterol in most people. Studies show that eating up to one egg a day does not significantly raise LDL cholesterol levels for most healthy men and women<sup>2,3</sup>.

*Food sources of cholesterol are:*

- liver
- cheese
- butter
- egg yolks
- shrimp

However, some people are more affected by dietary cholesterol than others. If you have been diagnosed with high LDL cholesterol or diabetes mellitus, you should consult a dietitian for a personalized plan. See also *Lowering Your Blood Cholesterol*, a booklet developed by the Heart and Stroke Foundation and the Canadian Egg Marketing Agency, available from your provincial egg marketing board.

## Soluble fibre

Eating foods that are high in soluble fibre lowers LDL cholesterol without lowering HDL cholesterol.

**2** Hu et al. 1999. A prospective study of egg consumption and risk of cardiovascular disease in men and women. *J Am Med Assoc* 281(15):1387-1394.

**3** Schnohr et al. 1994. Egg consumption and high-density lipoprotein cholesterol. *J Int Med* 235:249-251.



*Dietary fibre is material found in plants which is not digested by the enzymes in your body. Soluble fibre is found in fruit, oats, barley and legumes. Insoluble fibre is found in vegetables and cereals, such as wheat bran, and does not affect your blood cholesterol level.*



## SOLVING THE CHOLESTEROL PUZZLE

Following *Canada's Guidelines for Healthy Eating* can help you solve your cholesterol puzzle. These guidelines address all the food factors that affect blood cholesterol levels and are the foundation for *Canada's Food Guide to Healthy Eating*.

### 1. Enjoy a variety of foods.

- Focus on positive food choices. If you choose a variety of foods according to the *Food Guide*, you can get the nutrients you need and reduce your risk of heart disease.
- Eat regularly, when you are hungry. Studies show that eating three or more small meals a day, rather than one or two large meals, can lead to healthier cholesterol levels.
- Try new foods to add excitement.
- Enjoy the many tastes, colours and textures of foods.



### 2. Emphasize cereals, breads, other grain products, vegetables and fruit.

- Choose whole grain and enriched products more often. Breakfast cereals with oats can help lower LDL cholesterol.
- Enjoy a variety of breads and bagels containing wheat, oats or rye, and starchy foods, such as brown rice and pasta.
- Eat crackers, cookies, croissants, doughnuts and other baked or deep-fried foods less often. They contain saturated fats and hydrogenated oils (*trans* fats) which raise LDL cholesterol.

- *Choose dark green vegetables and orange vegetables and fruit more often.* They contain vitamins A and C which help protect artery walls from damage.
- Enjoy your vegetables raw or cooked. Try a new fruit or vegetable every week.
- Choose whole fruit or vegetables more often. Most fruit and vegetables have more fibre per serving than their juices.

*3. Choose lower-fat milk products, leaner meats and food prepared with little or no fat.*

- Choose skim or 1% milk and lower-fat cheeses, yogurt or cottage cheese. The lower-fat products contain less saturated fat than the regular types.
- Read labels before buying non-dairy coffee whiteners or whipped topping. They may contain palm, coconut or hydrogenated oil.
- *Choose poultry, fish and leaner meats.* They have less saturated fats. Processed deli meats or sausage may be high in saturated fat. Deep-frying chicken and fish adds *trans* fats.
- *Choose dried peas, beans and lentils more often.* Try baked beans, chick peas, kidney beans, tofu and other soy products. They contain soluble fibre and other natural substances which may lower LDL cholesterol.
- Eggs are a nutrient-dense meat alternative. They are an excellent source of high quality protein and provide many vitamins and minerals.



## Fats and food labels

Labels on packaged food can give you some clues about the amount or types of fat in the food. Use labels to compare products and learn more about the foods.

- On the **ingredient list**, look for words such as lard, cocoa butter, palm oil and coconut oil because they contain saturated fats. If hydrogenated oil is on the ingredient list, the product contains *trans* fat. Choose these products less often. Ingredients are listed in the order of the amount used in the product, with the first ingredient being present in the largest amount.
- If there is **nutrition information** on the label, look for the total amount of fat, as well as polyunsaturated, monounsaturated and saturated fat in the product.
- If you see cholesterol-free on a label for a food, such as chips or crackers, look carefully at the nutrition information. Remember, if they contain saturated or *trans* fats, “cholesterol-free” foods can still raise your LDL blood cholesterol.

<i>One large egg (50 g) contains:*</i>		<i>% Recommended Daily Intake</i>	
Calories	71 Cal/297 kJ	Vitamin A	8%
Protein	6 g	Vitamin D	8%
Fat	5 g	Vitamin E	9%
Polyunsaturates	0.8 g	Thiamin	3%
Monounsaturates	2.0 g	Riboflavin	14%
Saturates	1.5 g	Niacin	7%
Cholesterol	190 mg	Folate	15%
Carbohydrate	0.5 g	Vitamin B <sub>12</sub>	29%
		Iron	4%
		Zinc	5%

\* 1999 Nutrient Analysis indicates that cholesterol values have decreased from 215 mg and energy values from 75 kcal (310 kJ), as previously reported in the 1997 Canadian Nutrient Data File.

*4. Achieve and maintain a healthy body weight by enjoying regular physical activity and healthy eating.*

- Build physical activity into your daily life. Ask your local public health department for a copy of *Canada's Physical Activity Guide to Healthy Active Living* or activate Canada's Physical Activity Guide web site at [www.paguide.com](http://www.paguide.com).
- Set realistic weight goals based on your shape and family history. If you are concerned about excess body fat, consult your doctor to set a healthy weight goal.

*5. Limit salt, alcohol and caffeine.*

Excess amounts of salt and alcohol can increase risk of hypertension (high blood pressure), which is a risk factor for heart disease.



# CANADA'S FOOD GUIDE TO HEALTHY EATING RECOMMENDS:

## Grain Products

(5 to 12 servings daily)

1 serving =

*1 slice of bread*

*30 g cold cereal*

*175 mL or 3/4 cup hot cereal*

2 servings =

*1 bagel, pita or bun*

*250 mL or 1 cup pasta or rice*

## Milk Products

(2 to 4 servings daily)

1 serving =

*250 mL or 1 cup milk*

*50 g cheese*

*175 g or 3/4 cup yogurt*

## Vegetables & Fruit

(5 to 10 servings daily)

1 serving =

*1 medium size vegetable or fruit*

*125 mL or 1/2 cup fresh, frozen or canned  
vegetables or fruit*

*250 mL or 1 cup salad*

*125 mL or 1/2 cup juice*

## Meat & Alternatives

(2 to 3 servings daily)

1 serving =

*50-100 g meat, poultry or fish*

*1/3-2/3 can or 50-100 g canned fish*

*1-2 eggs*

*125-250 mL beans*

*100 g or 1/3 cup tofu*

*30 mL or 2 tbsp peanut butter*

For details about Canada's Guidelines for Healthy Eating, ask for a copy of *Using the Food Guide* from your local public health department or a dietitian in a hospital, community health centre or private practice, or check Health Canada's web site at [www.hc-sc.gc.ca/nutrition](http://www.hc-sc.gc.ca/nutrition).



## DO YOU NEED HELP IN SOLVING YOUR CHOLESTEROL PUZZLE?

If you have concerns about your blood cholesterol level, discuss them with your doctor. Talk to a dietitian to help you solve your individual health puzzle.

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