



FOODS THAT LOWER BLOOD CHOLESTEROL LEVELS

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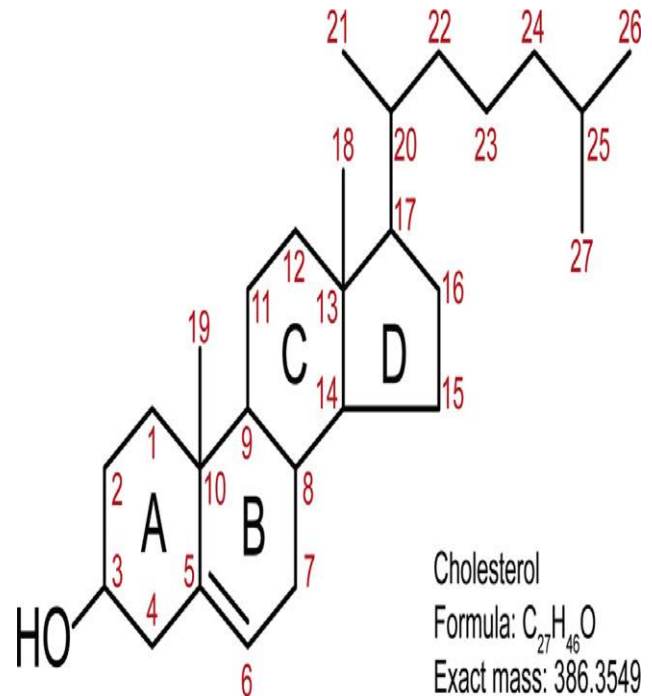
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CHOLESTEROL

Cholesterol is an important lipid molecule in cell membranes and lipoproteins. Cholesterol is also a precursor of steroid hormones, bile acids, and vitamin D. Abnormal levels of cholesterol or its precursors have been observed in various human diseases, such as heart diseases, stroke, type II diabetes, brain diseases and many others



CHOLESTEROL IN FOOD SCIENCES

- Public interests in dietary cholesterol had increased considerably due to the association of plasma cholesterol levels with the risk of heart diseases.
- As around 20e25% of cholesterol in our body comes from the food of animal origin, such as egg, meat, milk products, etc.,
- It is important to know the cholesterol concentration in our dietary intake

NORMAL CHOLESTEROL LEVELS

- ◉ Food nutritional information needs to be provided by laboratories to food producers for precise food labeling, as a nutrition food label has to inform customers about healthy eating and appropriate food
- ◉ Thus, evaluation of the exact cholesterol content in foods is crucial and drives the technological development for cholesterol quantification
- ◉ In adult **males and females**‘ cholesterol levels should be kept from 125 to 200 mg\dl

THERE ARE TWO MAIN FORMS OF CHOLESTEROL

- LDL, and HDL are lipoproteins.



GOOD AND BAD
CHOLESTEROL

TYPE OF CHOLESTEROL

- LDL
- low-density lipoprotein. It is sometimes called "bad" cholesterol because a high LDL level leads to the buildup of plaque in your arteries.
- HDL
- high-density lipoprotein. It is sometimes called "good" cholesterol because it carries cholesterol from other parts of your body back to your liver. Your liver then removes the cholesterol from your body

Bad vs. Good Cholesterol



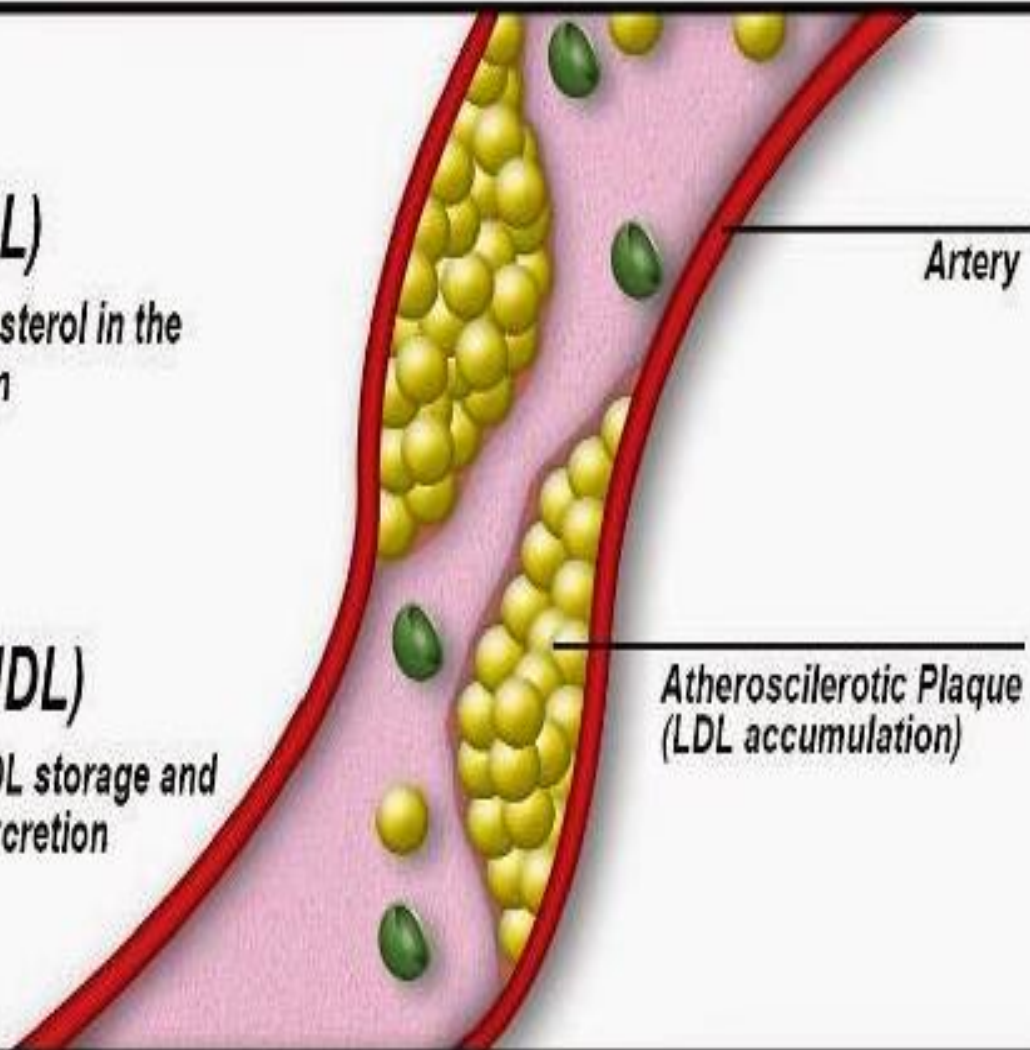
Bad (LDL)

stores cholesterol in the
blood stream



Good (HDL)

regulates LDL storage and
promotes excretion

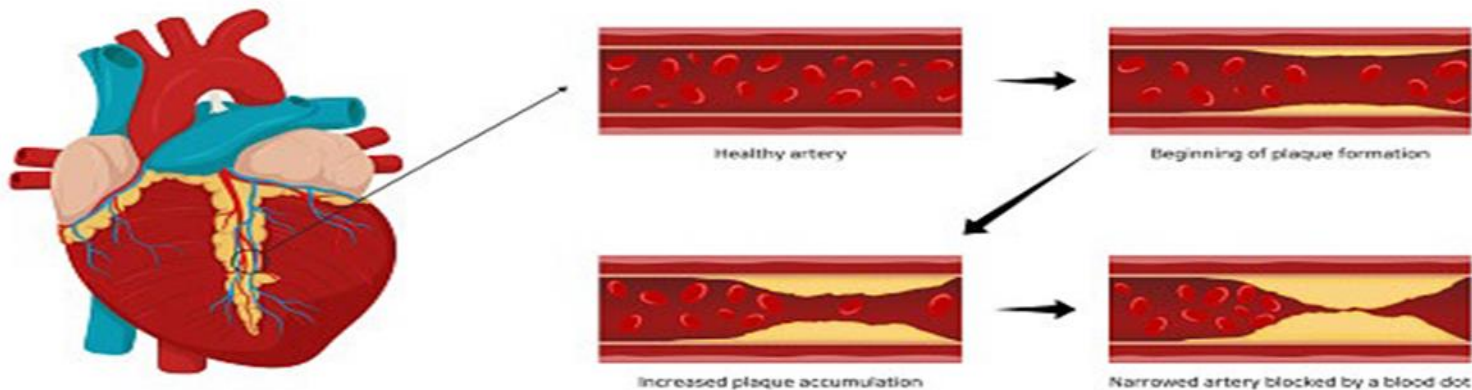


HIGH LDL?

- ⦿ The reason LDL is called bad cholesterol is because it **can build up in the walls of your arteries** and form plaque,
- ⦿ putting you at risk of a serious cardiovascular event, like a heart attack, stroke.

Atherosclerosis Stages

Plaque formation and growth.



Fiber-Based Cholesterol Lowering

- ◉ Dietary fiber is a good carbohydrate, also known as roughage, found in plant foods (not supplements)
- ◉ Because fiber is indigestible, it collects and removes of a variety of items as it passes through the digestive system.
- ◉ Bile may become entangled in the fiber mesh.
- ◉ Bile is taken out of the body together with fiber.
- ◉ The Body needs to make new bile and needs cholesterol to do so.
- ◉ Reducing heart disease risk and cholesterol

KINDS OF FIBER

- ◉ Soluble fiber

Becomes a thick gel in our intestines, which slows digestion (which keeps blood sugars from spiking) and traps fats so they can't all be absorbed (which lowers cholesterol levels).

- ◉ Insoluble fiber

Helps keep our stools soft and regular, always a good thing! Sources of insoluble fiber include whole grains, beans, lentils, and most vegetables.

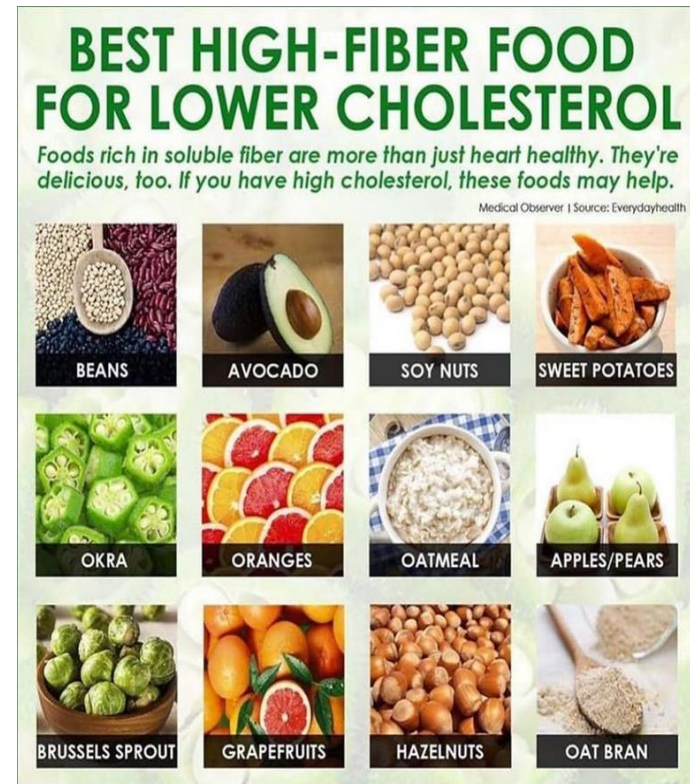
Both soluble and insoluble fiber make us feel full, which helps us to eat less.

HOW SOLUBLE FIBER LOWERS BLOOD CHOLESTEROL

- ◉ **Soluble fiber** dissolves into water and turns into a gel like substance within the digestive track.
- ◉ It mixes with the food and slows down the digestive process,
- ◉ traps fats so they can't all be absorbed (which lowers cholesterol levels).
- ◉ hence making one stay full for longer. Soluble fiber also lowers total and LDL cholesterol, which may reduce the risk of cardiovascular disease.

FOODS HIGH SOLUBLE FIBER

- ◉ Whole grains with- barley, oatmeal, oat bran, and quinoa.
- ◉ Vegetables- broccoli

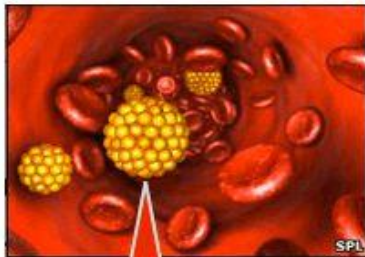


FOODS HIGH SOLUBLE FIBER

- ◉ **Apples:** One apple can contain 3-7 grams of dietary fiber, depending on its size. In addition, apples contain compounds called polyphenols, which may also have a positive impact on cholesterol levels.
- ◉ **Avocados** are rich in heart-healthy nutrients
- ◉ **Oats:** research confirms that the soluble fiber in oats lowers LDL cholesterol levels and can improve cardiovascular risk as part of a heart-healthy diet.
- ◉ **Nuts:** are a great source of unsaturated fats, which can help lower LDL cholesterol levels, especially when they replace saturated fats in the diet.

Key way to lower LDL cholesterol naturally

C. Because less cholesterol is recovered from digestion, cholesterol must be taken from your bloodstream in order to create more bile - yeah! You have successfully reduced your blood LDL naturally.



Cholesterol circulating in blood.



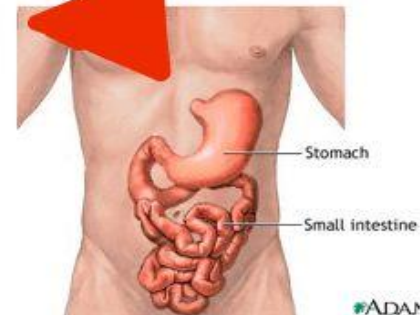
Normally 97% of the bile cholesterol is returned to the liver, so the net effect is very little cholesterol loss from your body. But this can be changed by B.

A. Liver pulls cholesterol from bloodstream to make bile which is stored in gallbladder (in green). Bile is squirted into intestine to digest fats.

B. You can stop the usual 97% of cholesterol that is returned to the liver for re-use. **Soluble Fibre** STOPS cholesterol from simply being reabsorbed back into your bloodstream. The fibre forms a gel like substance that traps cholesterol and forces it to be excreted instead.



prunes, barley, apples, pears, oranges, kidney beans, **Oatmeal**



EATING FOODS RICH IN SOLUBLE FIBER IS EASY

For example, to eat at least 10 grams of soluble fiber in a day, try:

- ⦿ Breakfast with 1 cup cooked oatmeal with berries and 2 tbsp ground flax (3 grams)
- ⦿ Lunch with 1 cup chili made with beans and a pear for dessert (4 grams) Snack with ½ cup raw carrots and ¼ cup hummus (2 grams)
- ⦿ Dinner that has 1 cup of steamed cabbage, broccoli, carrots and/or green beans (2 grams) Once you get started, you'll see that eating foods high in soluble fiber is a delicious way to lower your LDL-C.

THANK YOU