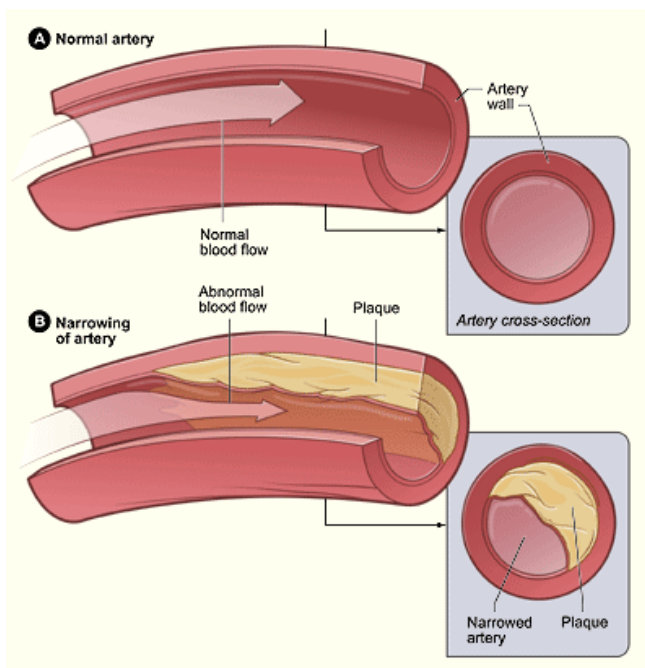
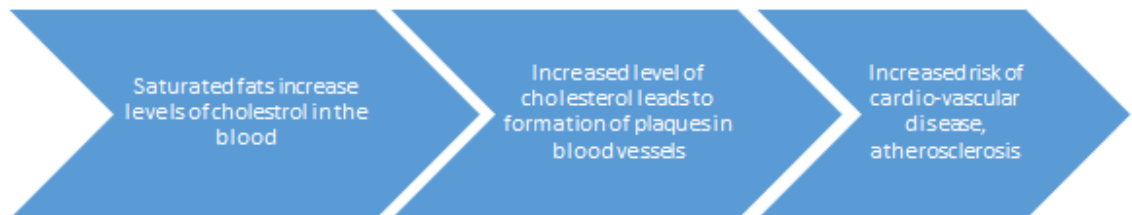


2. Lipids and their role in health and disease

Types of lipids

| Solid (mainly animal origin) Contain saturated fats | Liquid (mainly plant origin) Contain unsaturated fats |
|--|--|
| Butter | Vegetable oils (sunflower, rapeseed, etc) |
| Lard | Fish oil |
| Coconut oil | Algae oil |

What is the problem with saturated fats?



https://commons.wikimedia.org/wiki/File:Atherosclerosis_diagram.png

Source: http://www.nhlbi.nih.gov/health/dci/Diseases/Hbc/HBC_WhatIs.html

Cholesterol

Read the bullet point facts about cholesterol and answer the quick questions below

- **Cholesterol** is an organic compound, a naturally occurring lipid that can be found in animal cell membranes. It has several important biological roles.
- In humans, about 80% of cholesterol is produced by the body (by liver, intestine, kidneys and endocrine glands). The other 20% are obtained from the food.
- Cholesterol modulates membrane fluidity over a range of temperatures. It increases membrane rigidity by increasing the “packing” density of phospholipid molecules in the lipid bilayer.
- Cholesterol is an essential precursor for vitamin D biosynthesis. It is necessary for the production of various steroid hormones (such as cortisol, aldosterone) and sex hormones (oestrogen, progesterone, testosterone), as well as for the production of bile acids. It is also involved in nervous and immune system functions.
- Cholesterol is insoluble in water and thus cannot be delivered on its own to tissues via blood. Instead, in the blood cholesterol is found as soluble complexes with special transporter proteins. These proteins are called lipoproteins.
- There are several types of lipoproteins, differentiated by their molecular mass and the solubility of the lipoprotein-cholesterol complex, which is linked to the tendency of cholesterol crystals to precipitate and form atherosclerotic plaques.
- The main classes are high-density lipoproteins (HDL), low-density lipoproteins (LDL) as well as very low-density lipoproteins (VLDL). LDL transports fatty acids and cholesterol to peripheral tissues. HDL transports fatty acids and cholesterol to the liver, where they get broken down and removed from the body.

People talk about “good” and “bad” cholesterol in blood – what they actually mean are lipoproteins. Which lipoprotein (in terms of density) do you think is called “good” and which “bad”? Why?

In the “healthy foods” section of the supermarket you notice bottle of oil with a “no cholesterol!” sticker on it. It costs 50p more than others without such a sticker. Do you think it is worth paying more for the “no cholesterol” one? Explain your answer.