agMOOCs

Fat

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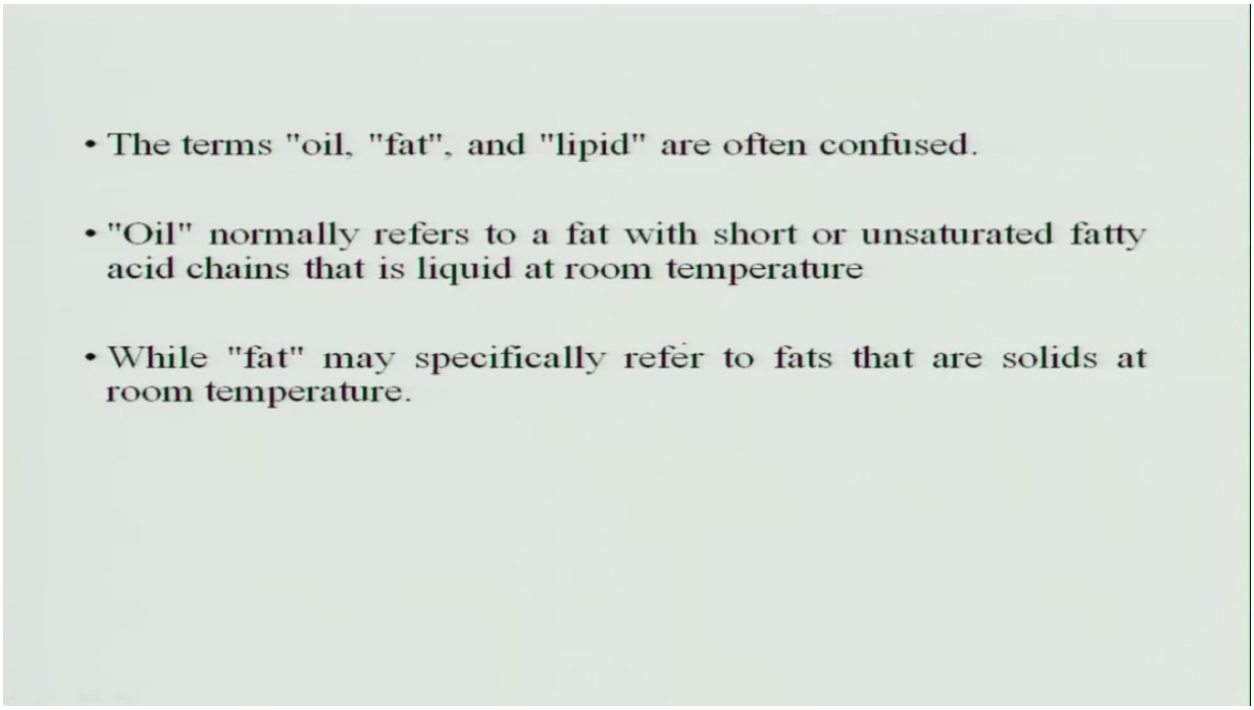
Welcome back. Last two classes we have seen about the major nutrients that is carbohydrates and proteins, how they function, what are the sources, and what happens if they are in excess or low quantity. So today let us see the other third major nutrient that is fat and what is the importance of fat in that.

Can you see the deep fried food soaked in fat? This is how we eat the deep fried food along with lot of fat in our food.

Fats

- Fat is one of the three main macronutrients
- Fats are also known as triglyceride, are esters of three fatty acid chains and the alcohol glycerol.
- 1gram of fat provides 9 kilo calories of energy

So fat is one of the three major macronutrients and it's also known as a triglyceride and these are the esters of three fatty acid chains which are linked to a alcohol glycerol. So that is why it is called a triglyceride. In one gram of fat provides 9 kilocalories of energy.



So we are often confused with the terms oil fat and lipid. What are they? Oil normally refers to the fat with short or unsaturated fatty acid chains that is liquid at room temperature. So whatever oil is the fat that is liquid at room temperature and it contains mostly unsaturated fatty acids. While fat may be specifically referred to as the solids at room temperature. Like our vanaspati.

- "Lipid" is the general term, as a lipid is not necessarily a triglyceride.
- Fats, like other lipids, are generally hydrophobic and are soluble in organic solvents and insoluble in water.

The lipid is the general term as lipid is not necessarily a triglyceride. So fats like other lipids are generally hydrophobic. They do not dissolve in water but they are soluble in organic solvents and insoluble in water.

Types of fats

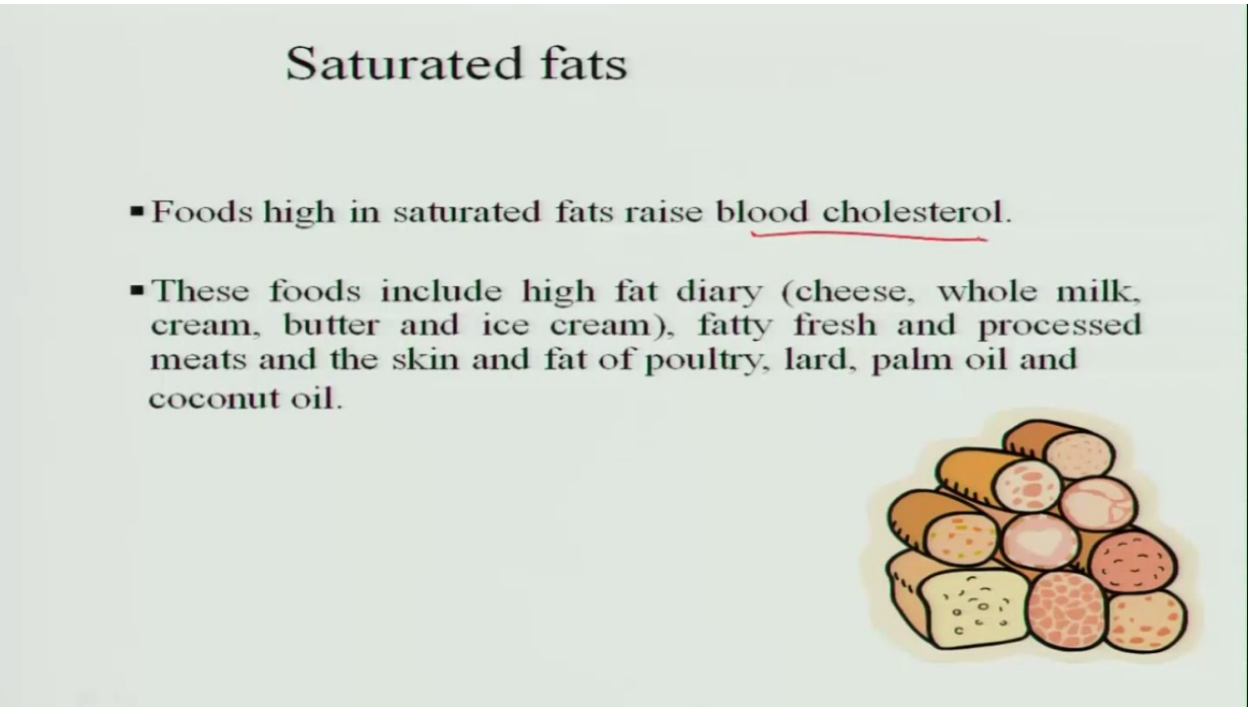
- Saturated fats

I. Trans fatty acids

- Unsaturated fats

I. monounsaturated fats
II. polyunsaturated fats

We have different types of fats. One is saturated fats which is an example is trans-fatty acids and unsaturated fats we have mono unsaturated and polyunsaturated fats.

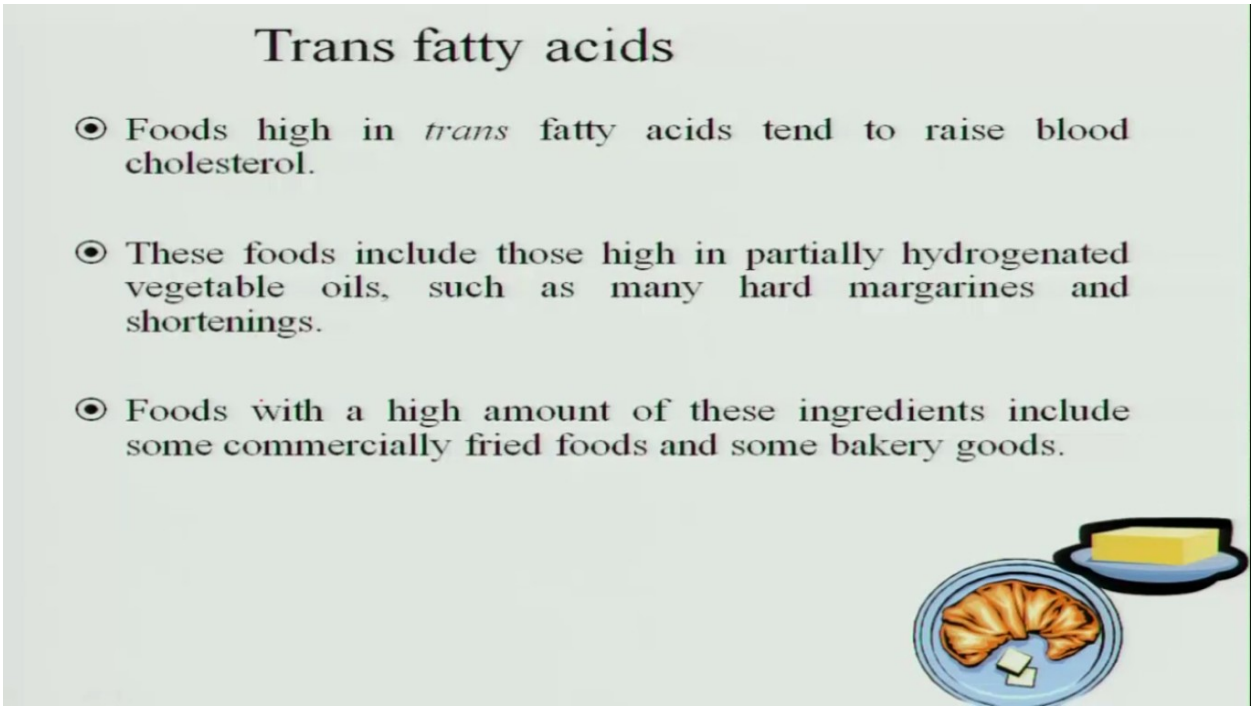


Now the saturated fats foods which are high in saturated fats they raise the blood cholesterol. So these foods include high-fat dairy like all the dairy products like whole milk, cheese, cream, butter, and ice cream. All these are very rich in saturated fats. Then fatty fresh and processed meats and the skin. So that is why everybody prefers meat without skin today because the fat lies just under the skin and the fat of poultry, lard then palm oil and coconut oil also are rich in saturated fats.

Then trans fatty acids; the foods that are rich in trans fatty acids they tend to again increase the blood cholesterol that is where they are not heart-friendly. They are very bad for heart. So these foods include those high and partially hydrogenated vegetable oils like vanaspati and dalda. And the hard margarines so we generally think we are having vegetable butter but hard margarines also has trans fatty acids and the shortenings whichever is used to make deep fried products very crispy such a lipid is also called as trans fatty acids. And foods with high amount of these ingredients they include commercially fried foods and some bakery goods.

Now unsaturated fats which are called as generally called as oils. They do not raise the blood cholesterol and they are present in all the vegetable oils; most of the nuts, olives, avocados, and fatty fish like salmon. This is the only one which has unsaturated fatty acids. So generally all the

nuts and oil seeds contain unsaturated fats. So they include both monounsaturated and polyunsaturated fats.



Examples are the olive, canola oil, sunflower oil, peanut oil these are some of the oils which have high amount of monounsaturated fat and vegetable oils like soybean oil, then corn oil, cottonseed oil, and many kinds of nuts are good sources of polyunsaturated fatty acids. So that is why today everybody says you eat a handful of mixed nuts so that your heart is healthy and use moderate amounts of food that are high in unsaturated fats taking care to avoid excess calories. When we say that one on saturated and polyunsaturated are good for heart it does not mean that we can take sufficient amount of fat or excess amount of fat as excess amount of fat produces more energy and it gets stored in the body as adipose tissue leading to obesity.

Unsaturated fats

- Unsaturated fats (oils) do not raise blood cholesterol. They occur in vegetable oils, most nuts, olives, avocados, and fatty fish like salmon.

- Unsaturated oils include both
  a) *monounsaturated fats* and
  b) *polyunsaturated fats.*

Now functions of fats. The main function of fat in the body is to provide energy. So by supplying energy fats they save the proteins from being used for energy and allow them to perform their important function of body building and repairing the tissues. So now these fat on oxidation they provide twice as much energy as the carbohydrates and proteins provide.

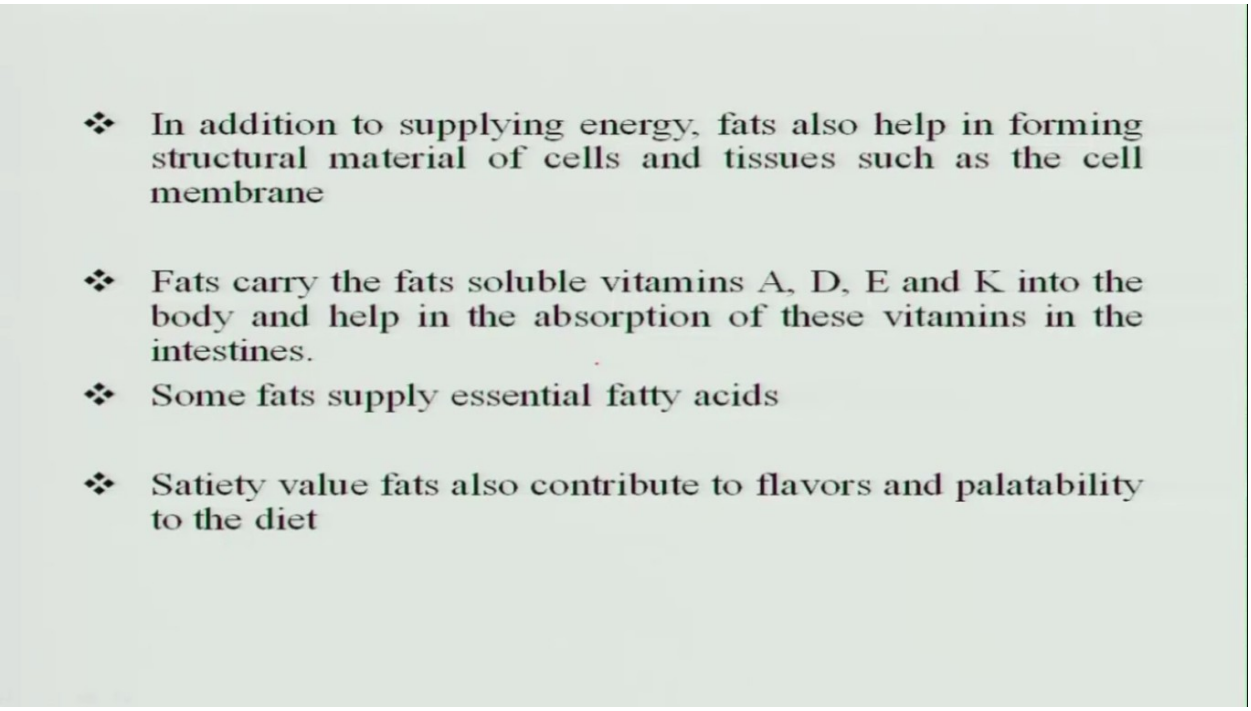
Functions of fats

The main function of fats in the body is to provide energy:

- By supplying energy, fats save proteins from being used for energy and allow them to perform their more important role of building and repairing tissues.

- Fats on oxidation provide almost twice as much energy as that given by carbohydrates.

And in addition to supplying energy they also help in forming the structural material for cells and tissues like the cell membrane has the fats. Then fats carry fat soluble vitamins A, D, E and K into the body and help them to be absorbed into the body from the intestines. Then some of the fats supply essential fatty acids also. Essential fatty acids are the linolenic and arachidonic acid. Now satiety value of fats contributes whenever we have a high fatty you have a feeling of fullness. So this satisfaction when you eat fats contribute to the flavors and palatability of the diet.



Now fats in the body they supply fuel to most of the tissues and they act as fuel reserve whatever extra kilocalories we will consume our store in the form of adipose tissue which are released when the person is under starvation or during illness. This illness should be a prolonged illness not one or day two to get energy from the fat. Then organ protection. The examples of organs that are protected by the fact are eyes and kidneys. See there is a layer of fat which protects them from against injuries.

Fats in the body

- Supply fuel to most tissues.
- Fuel reserve: excess kilocalories consumed are stored in the specialized cells called adipose cells.
- Organ protection: Examples of organs protected by fat are eyes and kidneys

Then they also help in lubricating the body tissues. Then the subcutaneous fat which is present under the skin helps us to insulate the body so it protects us from excessive heat and cold. Therefore fat also is an essential nutrient which has to be included in the diet without fail but you have to see what is the type of fat that has to be included and what is the quantity right type and right quantity of fat is very important to be included in the diet.

- Lubrication :

  fats also lubricates body tissues

- Insulation:

  The subcutaneous layer of fat beneath the skin helps to insulate the body by protecting it from excessive heat or cold

Thank you.