agMOOCs

Energy-1

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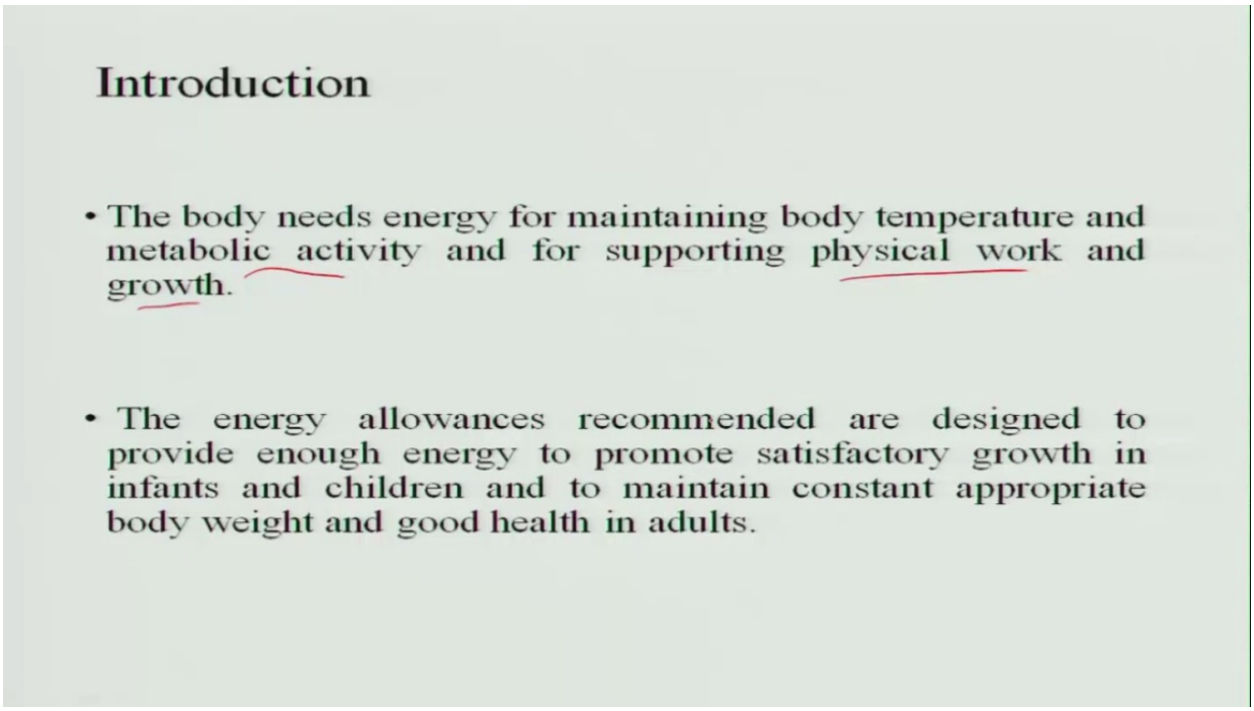
Welcome back. Last few classes we have been talking about the major nutrients and saying that they are good sources of energy. And so what is the role of energy in our body? Let us today see what is the role of energy in our body.



So the body needs energy for maintaining the body temperature, the metabolic activity and supporting all the physical work and growth. So let us imagine without energy we cannot do any work. So the energy allowances recommended are designed to provide enough energy to promote satisfactory growth in infants and children, and to maintain the constant appropriate body weight and good health status in the adults.

Now factors that influence the energy needs. They are the age, body size, our energy requirements depend upon the body size, the physical activity we carry out, the climate, and altered physiological status like pregnancy and lactation.

Factors influencing energy needs

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Now role of macronutrients in providing energy. So the nutrients are the environmental substances that are used for energy, growth and bodily functions of the organisms. So depending upon the nutrient these substances are needed in small amount or larger amount depending upon what type of functions they carry out.

Role of macronutrients in providing energy

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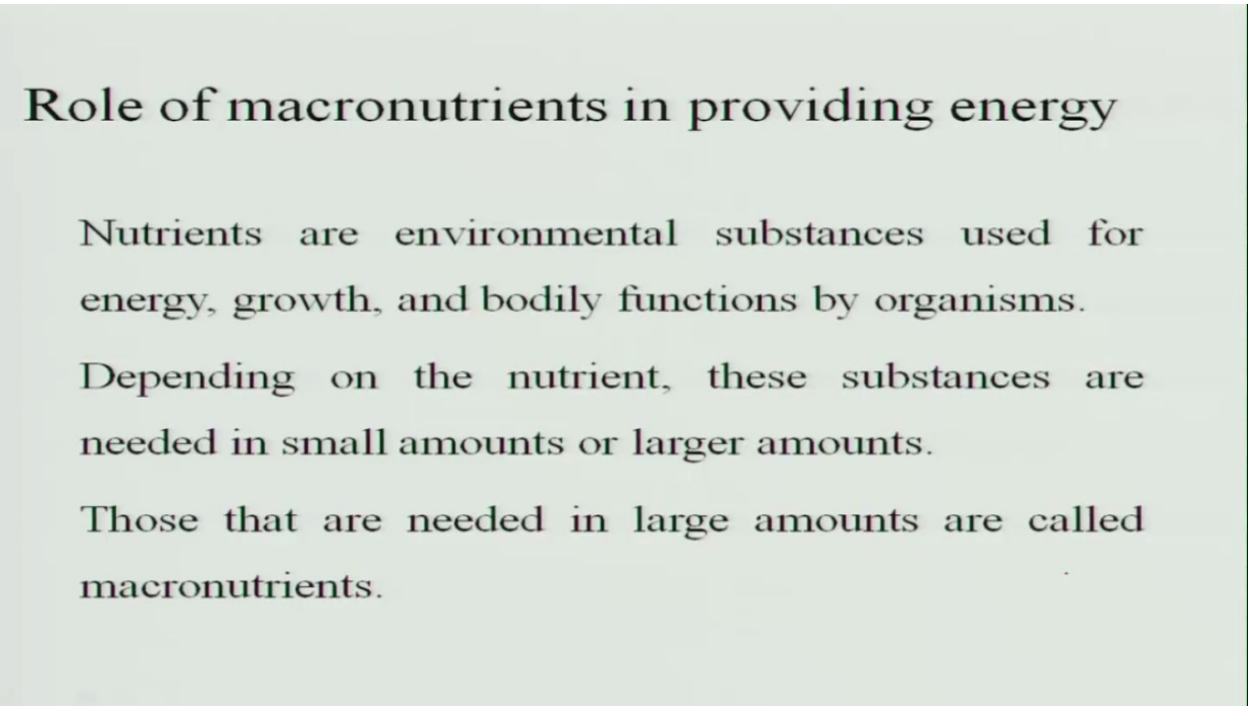
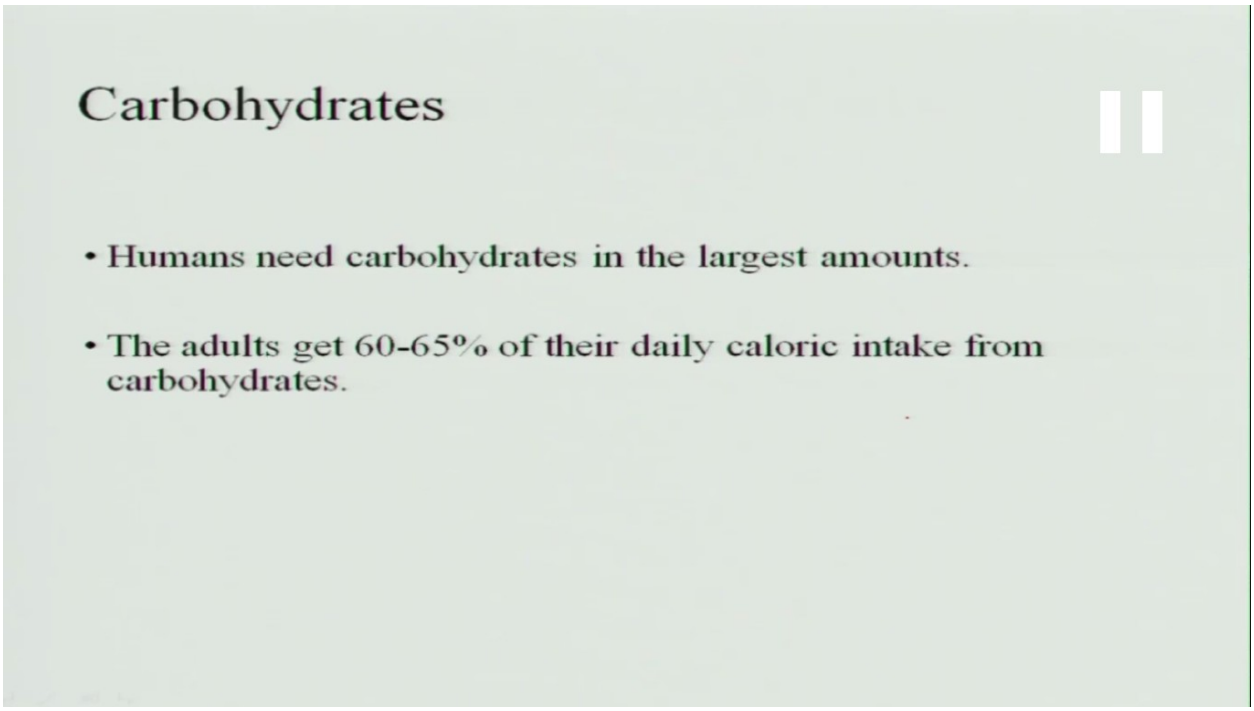
Those that are needed in large amounts are called macronutrients.

So those that are required in large amounts are called as macronutrients and there are three macronutrients which are required for the human beings. We have been talking about carbohydrates, lipids, and proteins. So each of these macronutrients provides energy in the form of calories. For example I've been repeating this; carbohydrates throw at 4 kilocalories per gram. Proteins provide 4 kilocalories per gram and lipids provide more than 2 times of the calories provided by carbohydrates and proteins that is 9 kilocalories per gram.

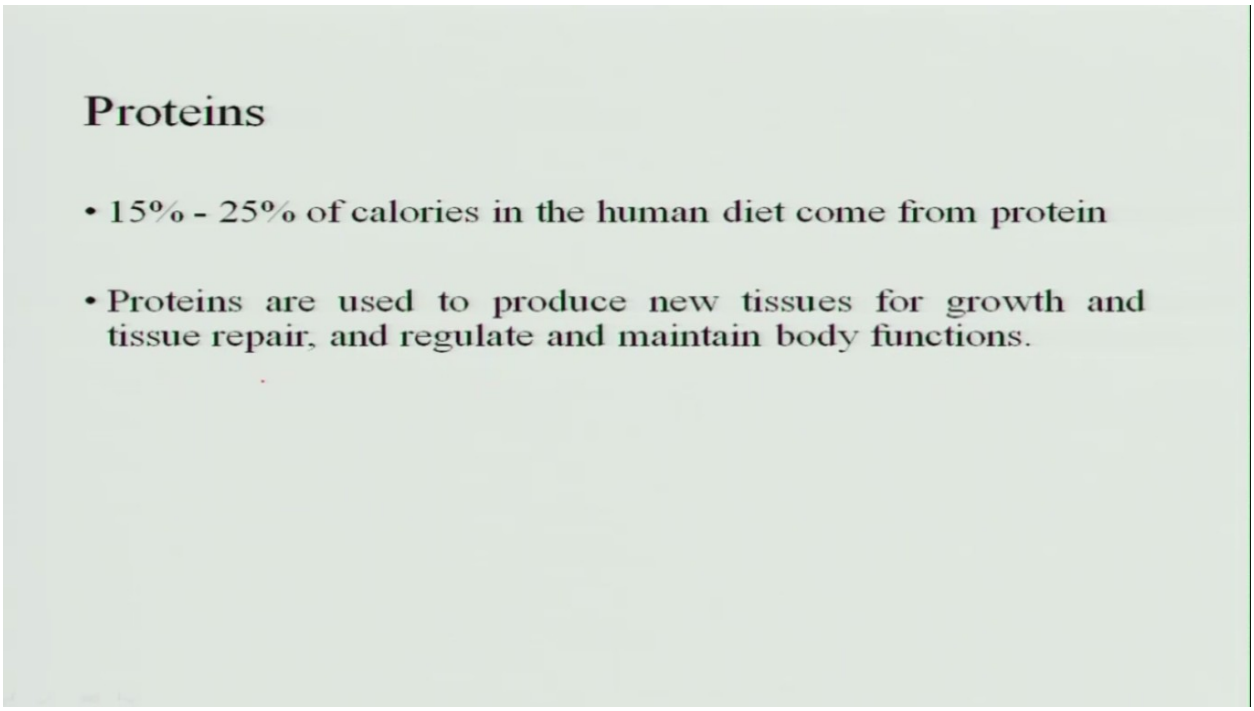


So this means that if we look at a food label when you are accustomed to reading the nutrient levels it lists ten grams of carbohydrates there is no protein and no fact. Then what is the amount of energy that food will provide? It is only 10 into 4 kilocalories. That is 40 kilo calories only. Whereas if the food contains 10 grams of carbohydrates, 5 grams of protein and 5 grams of fat you calculate it according to the amount of energy that is given by each food that is 10 into 4, then 5 into 4, and 5 into 9 it gives 105 kilocalories of energy.



Now carbohydrates the human needs carbohydrates in larger amounts that is 60 to 65% of the total calories should be provided from the carbohydrates. So all stable foods that we eat are carbohydrate based and carbohydrates are easily metabolized which just means they are chemically broken and used for the body's main fuel source and all our body, tissues have the ability to use the simple carbohydrate glucose as energy. So it does not require any other. It is a direct to break down into glucose and utilization into the body.

These carbohydrates can be simple or complex which refer to their chemical structure. So simple carbohydrate they taste very sweet like the fruit sugar while complex carbohydrates they taste savory like starch in potatoes and fiber is the indigestible form of carbohydrate. so since human beings cannot digest or break down the fiber they pass through the digestive system and they are excreted as waste products and they take many other products which are not used by the body to eliminate them.



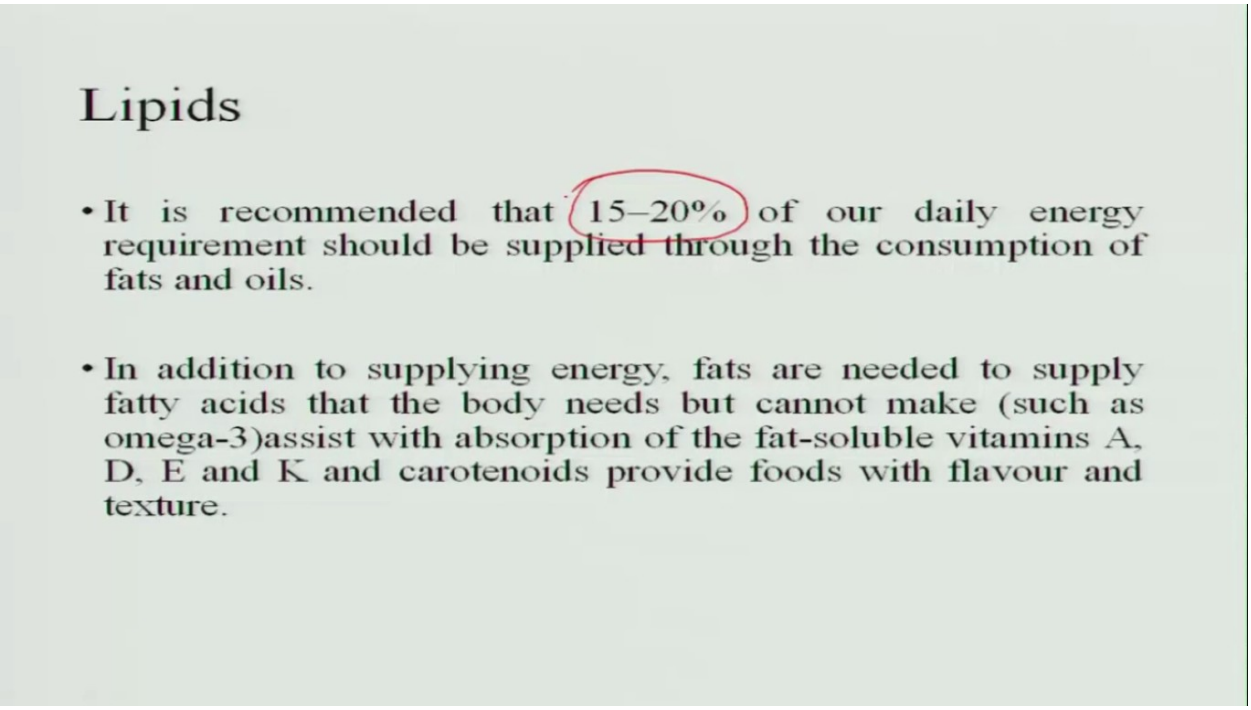
Now proteins we have to obtain 15 to 25% of the total calories in the human diet through proteins and they are used to produce new tissues for growth and repair and regulate the body functions. Enzymes are also proteins. So they are used for digestion, protection, and immunity. So the essential hormones which regulate the body are also from the proteins.

Finally the proteins may be used as a source of energy when the carbohydrates are not available. So protein is found in meats, poultry, then fish, meat substitutes cheese, milk and nuts, and legumes and in very small quantity in starchy foods and vegetables. So that is why the vegetables and starchy foods are not the main source of proteins.

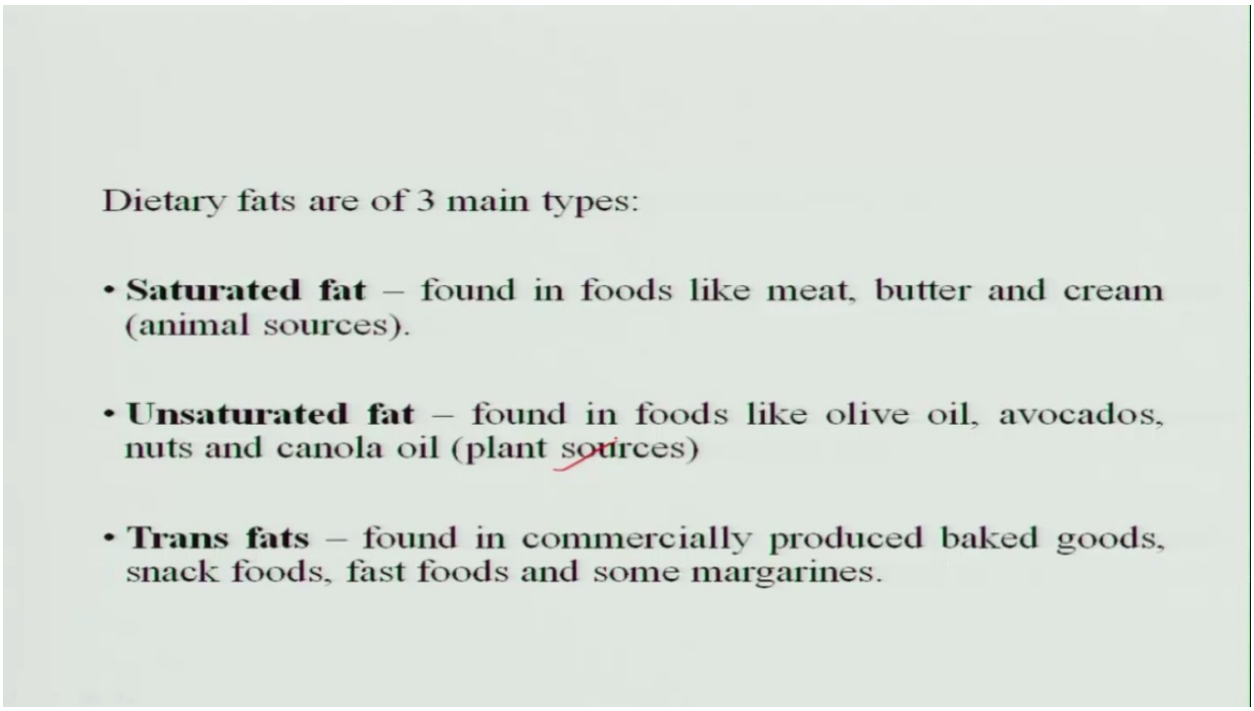
And the body breaks down proteins into its building blocks the amino acids. There are about 500 known amino acids 21 of which are very essential for the body and 9 are considered to be essential because they are not produced in the body and they have to be supplied through the food.

Then proteins that contain all the 9 essential amino acids are high quality proteins and these high quality proteins tend to come from animal sources. And proteins which do not contain nine essential amino acid are considered as low quality proteins. So these come from the plant sources.

The third source of energy is the lipids that we have to get 15 to 20% of the total kilocalories from the fat. So in addition to supplying energy fats are needed to supply the fatty acids which the body needs and which it cannot make like the Omega-3 or linoleic acid and assist in the absorption of fat soluble vitamins and provide the foods with flavor and texture. A food which is not having any fat in it is bland and I mean taste and texture. So fat provides texture to the foods.



And dietary fats are of three types; saturated fats found in animal sources, unsaturated found in plant sources, and trans-fatty acids now are found in the commercially produced baked goods and wherever the fat is continuously heated many times then trans fatty acids are produced.



Therefore the energy consumption is from the three sources of food that is carbohydrates, about 60-65% of the total calories. Proteins 20 to 25% and 15 to 20% from the fats.

Thank you.