

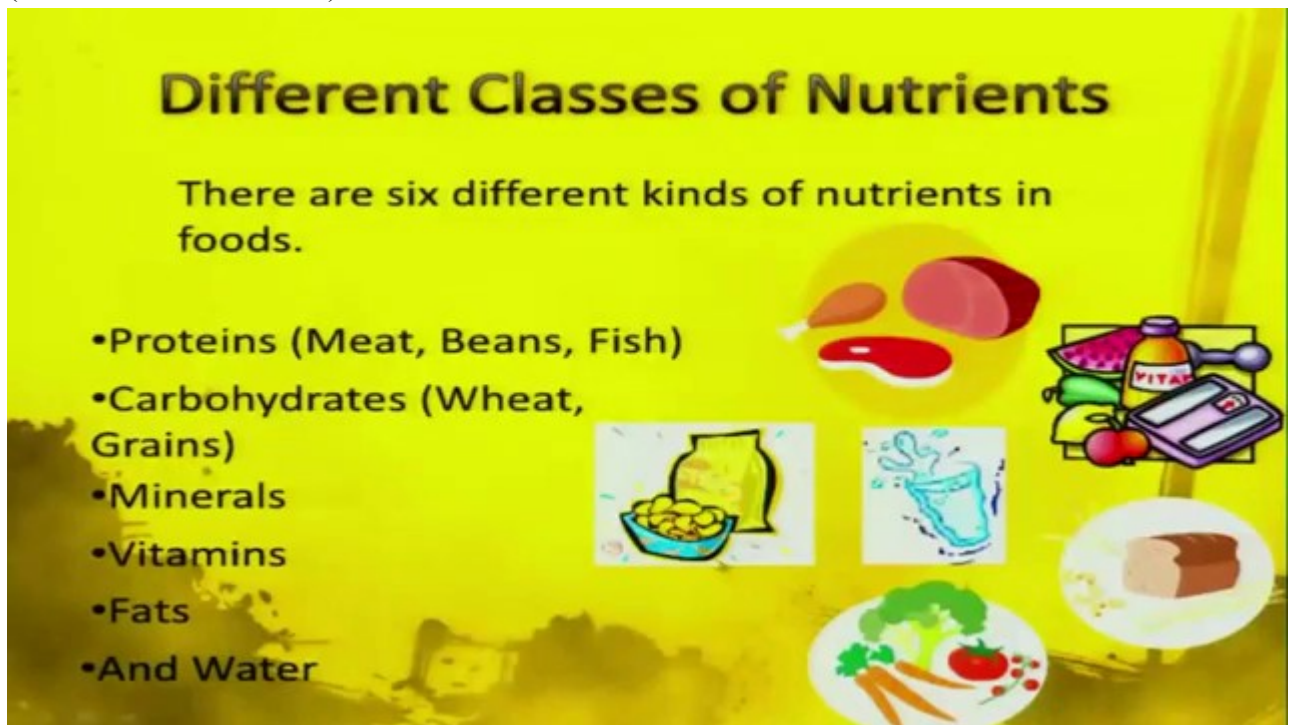
agMOOCs

Relationship between Food, Nutrition and Health-2

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Hello. Last class we have seen about the relationship between food nutrition and health and we will be continuing with the same class. Whereas last class we have seen what are the definitions and what are the functions of food. So this class we will see about the different classes of nutrients that are present in food. All the foods have these nutrients.

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So there are six different types of nutrients in our food. The protein which is present in meat, beans, fish and pulses et cetera then carbohydrates which is present in all the cereals and millets, roots and tubers then minerals, vitamins, fats and water, water also is a main nutrient. So let us see each of these nutrients in detail.

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Proteins

Used for replacement and repair of body cells and for growth.

Made up of amino acids – building blocks of the body

Provide essential amino acids to the body

They provide structure to the body, cells and are part of hormones, enzymes etc

Found in eggs, milk, cheese and meat

Essential amino acids must be supplied by food

So starting with the proteins, proteins are the substances that are used for replacement and repair of the body cells for growth. These are made up of the amino acids that means the amino acids are the building blocks of proteins. So they provide essential amino acids to the body. When we call them essential amino acids they are not synthesized by the body. They have to be essentially be provided from the food. So they provide structure to the body cells and a part of hormones and enzymes. Then they are found mainly in eggs, milk, cheese, meat and pulses. So these essential amino acids they must be supplied from food.

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Carbohydrates (CHO)

- Main source of energy – 1 gm provides 4 kcal of energy
- Made up of carbon , hydrogen and oxygen,
- Sugars are simple CHO -
- Starch and fibre are complex CHO
- Sugars are found in fruits, honey and milk, sugar
- Starches are found in cereal grains, pulses, roots & tubers
- Fibre is found in whole grain cereals, seeds, beans and peas

Then the next nutrient is the carbohydrate, which is also a major nutrient in the food. So the main function of carbohydrates is to provide energy. So one gram of carbohydrate provides us four kilocalories of energy and this carbohydrate is made up of carbon, hydrogen and oxygen. So they are -- we have simple carbohydrates which are made of sugar and starch and fiber and complex carbohydrates, so carbohydrates are divided into simple and complex. So sugars are found in fruit, honey, milk and the sugar as it what we eat. Then starches are found in cereal grains, pulses, roots and tubers. And fiber is found in the whole grain cereals, seeds, beans and peas.

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Fats

Called as **lipids, oils**

Provide excess energy – 1gm provides 9 kcal of energy and help to absorb fat soluble vitamins

Fat is good storage form for energy

Source of essential fatty acids

Excess energy is converted to fat

Classified as saturated, or unsaturated based on their structure

Saturated fats are associated with high cholesterol

The fats also is the major nutrient which is the main source of energy. It only gives us energy to the body. So these are also called as lipids and oils. Then they provide excess energy that means, one gram of fat provides 9 kilocalories of energy. Whereas one gram of carbohydrate it provides four kilocalories of energy. So imagine it is more than two times of energy that is given by one gram. And the main function of fat is also to absorb fat soluble vitamins. Then this is a good storage form of energy. So when we have fat in the body it gives us I mean the nutrition when we are under starvation. So it is a form of stored energy.

Then it has form of social, it is a form of main source of essential fatty acids. These essential fatty acids are again very useful for the maintenance of the cell walls in the body. Therefore when again when we say essential fatty acids they are required for the body very important function and they are supposed to be supplied from the food. They are not present or synthesized in the body. And whenever we have excess amount of carbohydrates in the food these are converted into fat and stored in the body as adipose tissue. So they are classified into saturated, unsaturated based on this structure. Saturated fats are generally associated with high cholesterol. So if you take excess amount of saturated fats that means the cholesterol level in the body also may increase.

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Minerals

- Are organic nutrients
- Many chemical reactions in the body are regulated by minerals
- They act as co enzymes in many metabolic reactions
- They are very important for maintaining the acid base balance, water balance and the homeostasis of body fluids
- Though required in small amounts they are very important for maintaining normal body functions

Minerals are the minor nutrients but most essential in the body. So these are all organic nutrients and many chemical reactions in the body are regulated by minerals. So they act as coenzymes in many metabolic reactions. They are very important for maintaining the acid-base balance, water balance and mainly the homeostasis of all the body fluids. When all these are maintained properly then the individual is healthy. Though required in very small amounts they are very important for maintaining the body functions.

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Vitamins

- Needed for growth, regulating body functions, and preventing disease
- Generally, all the vitamins are provided to the body by a well balanced diet
- Both excess and deficiency of vitamins cause health problem
- There are 2 groups of vitamins

Fat Soluble

Water soluble

Next are the vitamins which again play a very important role in the body for the maintenance of the body and giving protection to the body, so they are needed for growth, regulating the body functions and preventing disease. So generally all the vitamins are provided to the body if we have a complete balanced diet. So we need not have to take some vitamin supplements when you take a balance diet. Both excess and deficiency of these vitamins they cause health problems. So now we have two groups of vitamins; one is the fat soluble vitamins which have the vitamin A, D, E and K and this fat soluble vitamins are stored in the body and whenever there is some deficiency these stored nutrients are utilized for the body functions. And this vitamin A is mainly required for the epithelial tissues health and for eyesight. Whenever we talk of a night blindness or any eye problem we talk about vitamin A. So vitamin A is very essential for the function of the eye.

And vitamin D is associated with the bone growth. That means vitamin D is very essential for the calcium absorption. If vitamin D is not supplied then calcium absorption is hampered and the bones become weak. And vitamin E it is an antioxidant. It is a very important vitamin where it is required for reproduction and also the health of the cells. So it prevents the oxidation of cells thereby it prevents the excess growth of the cells which results in cancer. Then vitamin K is very important for blood clotting. So if vitamin K is not there it is very important for the conversion of prothrombin to thrombin where which is essential for the blood clotting. And if it is not supplied it may then -- if there is any injure, the blood bleeding may not stop. So that is very dangerous, so especially the pregnant woman before her delivery is given an injection of vitamin K to prevent over bleeding.

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Now water soluble vitamins are also very important. This is the meaning itself says when they are water soluble they are soluble in water. And these water soluble vitamins are not stored in the body. They are – whenever they are excess they are excreted out through the body. They are not stored in the body. That means we have to supply these vitamins, water soluble vitamins every day in our food to keep the body healthy, because there is no storage. And when you don't give water soluble vitamins for two or three days the deficiency symptoms start, so very essential to give this water soluble vitamins. You have the Thiamin, Riboflavin, Niacin et cetera and Pantothenic acid, all this the folic acid and vitamin B12, these two are the water-soluble important water soluble vitamins which indeficiency may cause anemia or folic acid deficiency causes neural tube defects in the children. So this folic acid and vitamin B12 are very important for the formation of blood. For the maturation of RBC they are very important. Therefore they cause anemia.

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Water

- Required for survival
- Important for maintaining the blood volume, as a medium for solvent for many substances
- Regulates body temperature, transports many substances to all cells, is a lubricant
- Cells in the body require water to carry out their functions
- Almost 60% of the body is composed of water
- Water is lost from the body in the form of perspiration, exhalation and excretion for removing the waste products.

Next important nutrient which is required by the body is water. We just think water is okay and many people avoid drinking water so that they can be happy, isn't it. So water is required for survival and our body almost 65% of the body is made up of water. And you have the important for maintaining the blood volume. It is a medium for solvent. It dissolves many substances in the water and carries it throughout the body and supplies to the cells. So it regulates the body temperature, transports many substances and it also acts as a lubricant. Imagine if you don't have water content in the body your hemoglobin level will go up, the blood pressure changes, so you cannot move your joints very easily as we are moving without any knowledge. So it acts as a very good lubricant. So as all the cells in the body require water to carry out their functions, as I said almost 60% to 65% of the body is composed of water. And if water is lost from the body in excess it leads to dehydration and when it is when a person is dehydrated it becomes very sick. So all the functions of the body are slowly stopped when there is a lot of dehydration. So water is such important component of body. And water is generally it is lost from the body in the form of perspiration, in the form of acceleration and excretion and this is the lost of water from the body is only to remove all the waste products from the body. So otherwise how will the waste products will go out of the body. Water again helps in excreting the waste products from the body. So such important is the water and any individual requires about six to eight glasses of water per day to keep himself hydrated and healthy.

Okay. So these are the functions of various nutrients that are present in the body. And for a healthy body we require all the six important nutrients that is the carbohydrates, proteins, fats which are majorly required for bodybuilding and energy and the minerals, vitamins and which are required for protection of the body and they give us resistance against the different illnesses and also they are required for carrying out the metabolic actions in the body and keeping the body healthy, and water is a very important nutrient which keeps our body

healthy and we are -- we look so fresh because of the water content in the body. So with this the relationship between food, nutrition, health is I think very well understood by all of you and we will see about the --we will continue with the next topics in the next class. Thank you and good bye.