agMOOCs

Recommended dietary allowances

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Welcome back. So, all this time we have seen the role of nutrients in the body and the digestion absorption of nutrients. So we have been talking about the balance diet. For that we have to know what is the recommended dietary elements, how much you have to eat? So let us see what is the recommended dietary allowance.

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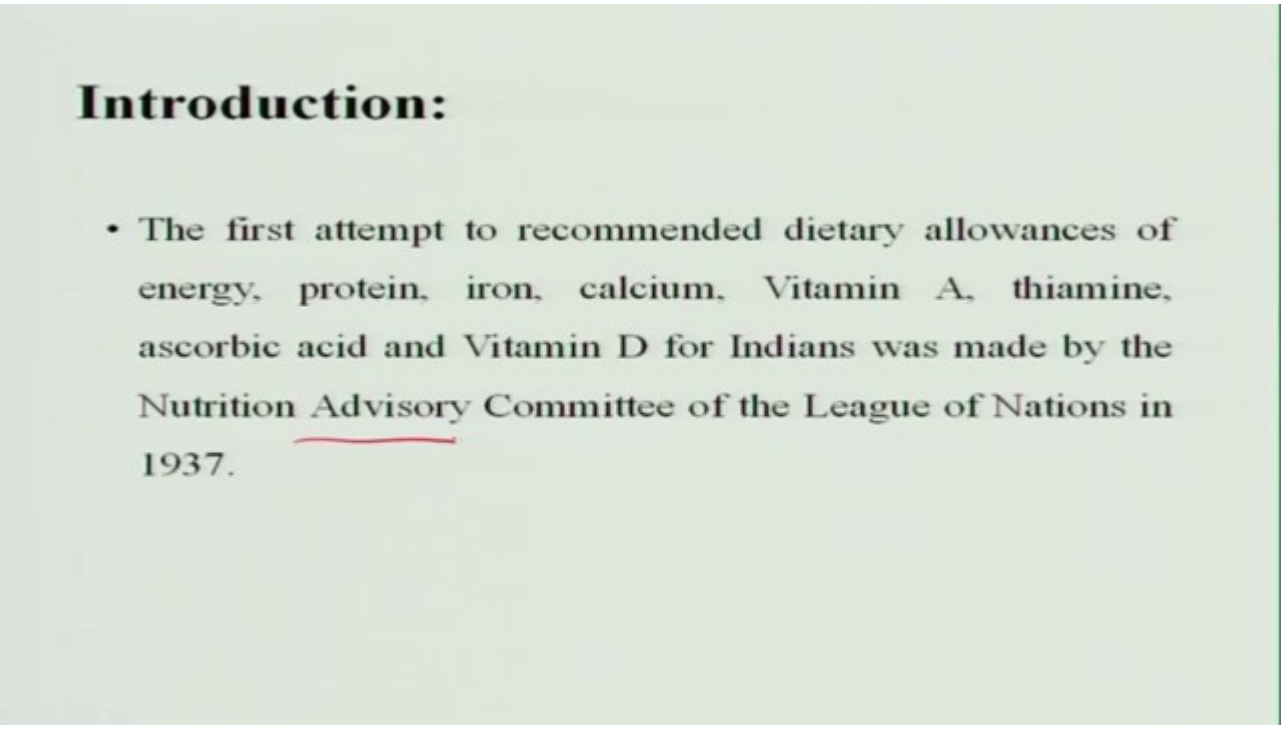

This recommended dietary allowances was first made by a Nutrition Advisory Committee of the League of Nations in 1937. So they have tried to recommend allowances for energy, protein, iron, calcium, vitamin E, thiamine, ascorbic acid and vitamin D and so on for Indians.

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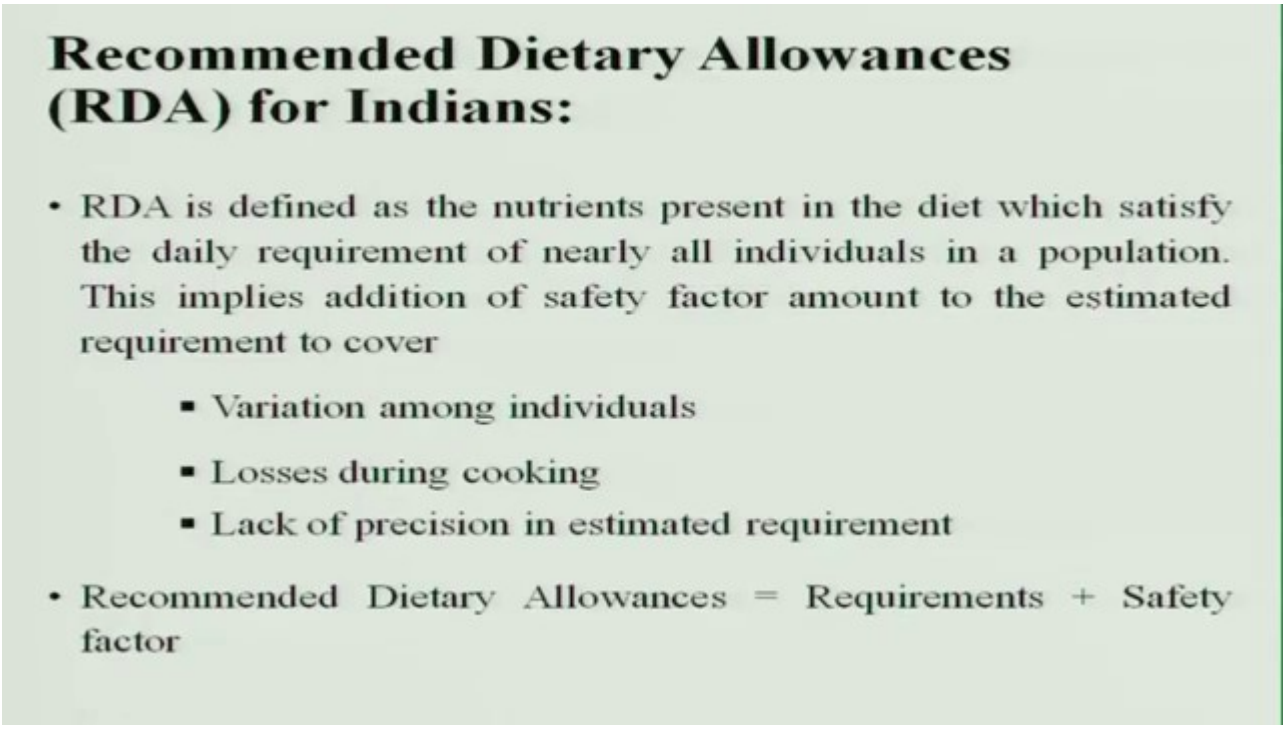

So recommended dietary allowances are different for different nations, recommended dietary allowances for Indians are made usually by the Indian Council of Medical Research. And this recommended dietary allowance is defined as the nutrients that are present in the diet which satisfy the daily requirement for nearly all the individuals in a population, because these recommended dietary allowances are made generally, they are not taken into consideration for an individual. So this implies addition of safety factor amount for the estimated requirement to cover the variation among individuals because they may be individuals with different height, weight and physiological status then losses during cooking, because the way we process the food also involves so many losses of nutrients and lack of precision of estimated requirement. We cannot precisely estimate what is the requirement. For that we have the safety factor. So recommended dietary allowances include requirements plus safety factor

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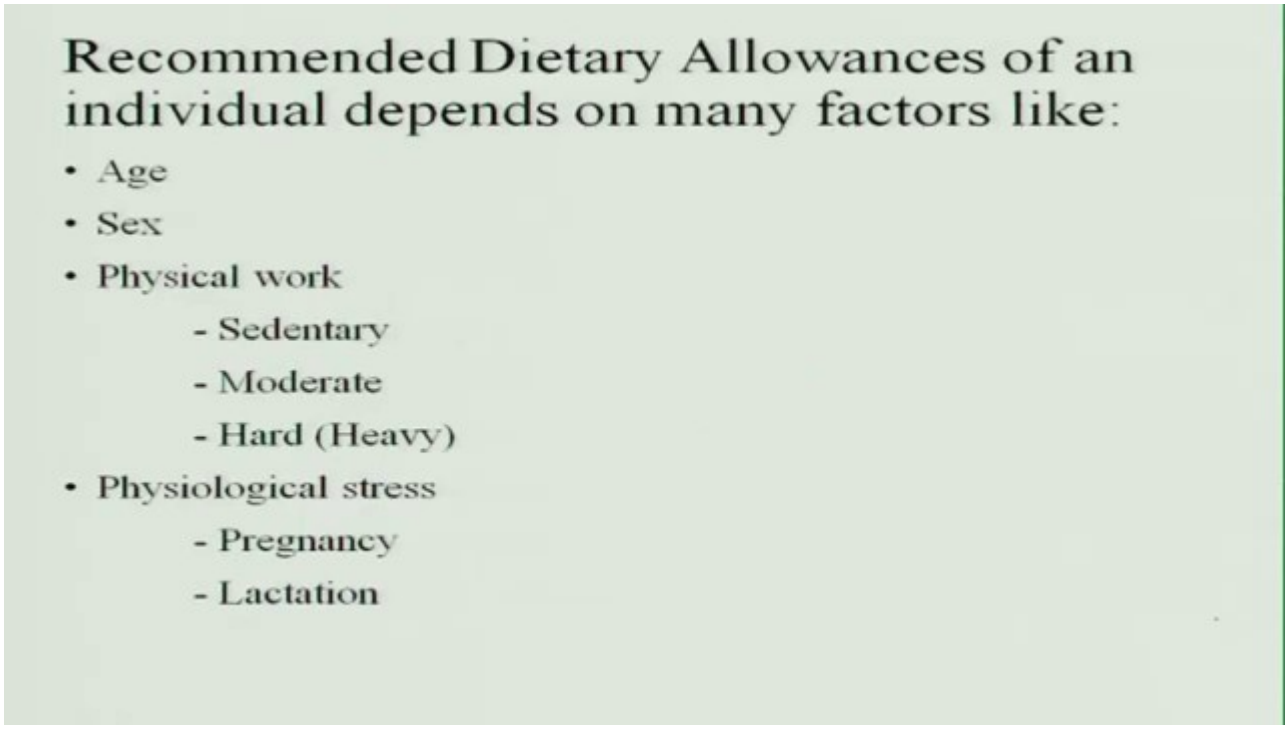

And they also depend upon various factors like the age of the individual. We have different age groups. We cannot recommend the same amount for an infant compared to an adult man or for a pregnant woman. Then sex, so differ, the weight and height of individuals are different and the different metabolism also is slightly different in with the gender therefore we take sex into consideration. Then physical work, depending upon on what type of work they are doing, whether they are sedentary, moderate or heavy recommendations are made it, because if a sedentary person eats excess amount it will result in obesity. And physiological stress like pregnancy, lactation also is taken into consideration.

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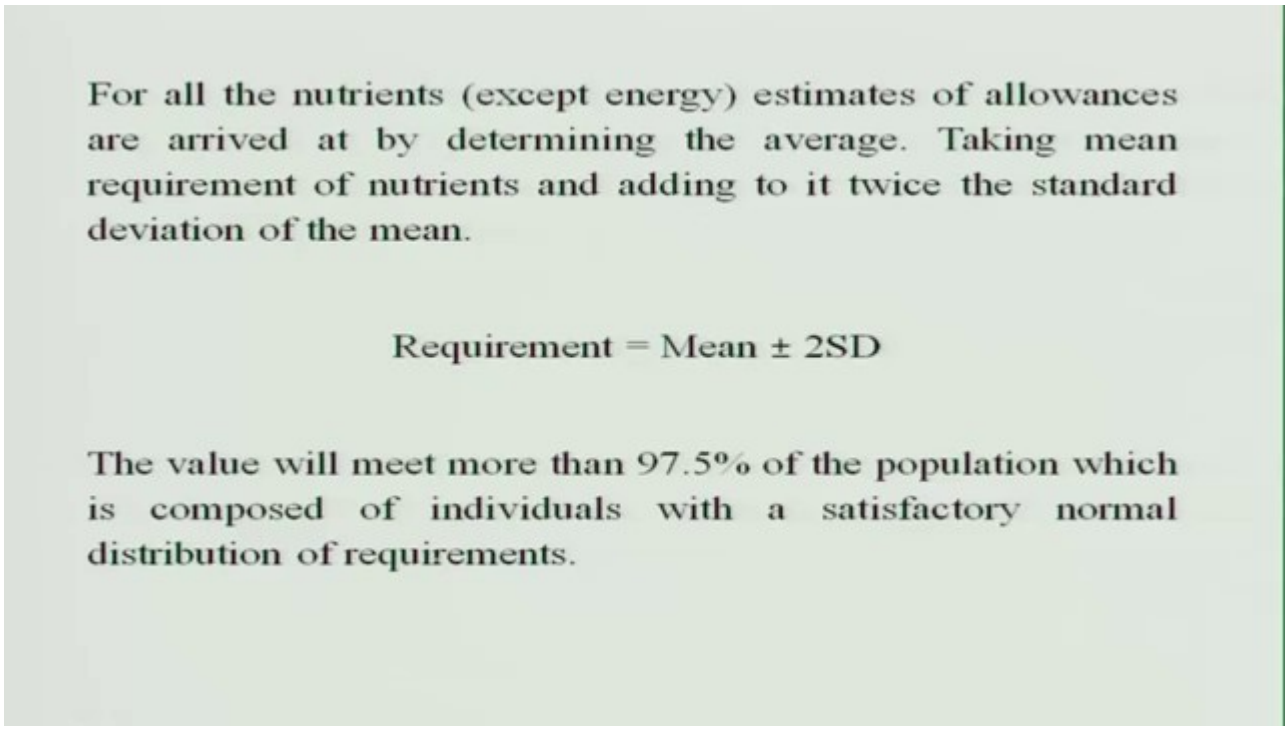

And for all the nutrients except energy the estimate for relevances are arrived by determining the average, because energy if you take an average then it will increase in some people. So taking the mean of the requirement plus 2SD, two standard deviation of the mean we will be able to 97.5% of the population which is composed of individual with satisfactory normal distribution of requirements. So mean plus 2SD will cover almost the entire population up to except 2.5% of the population.

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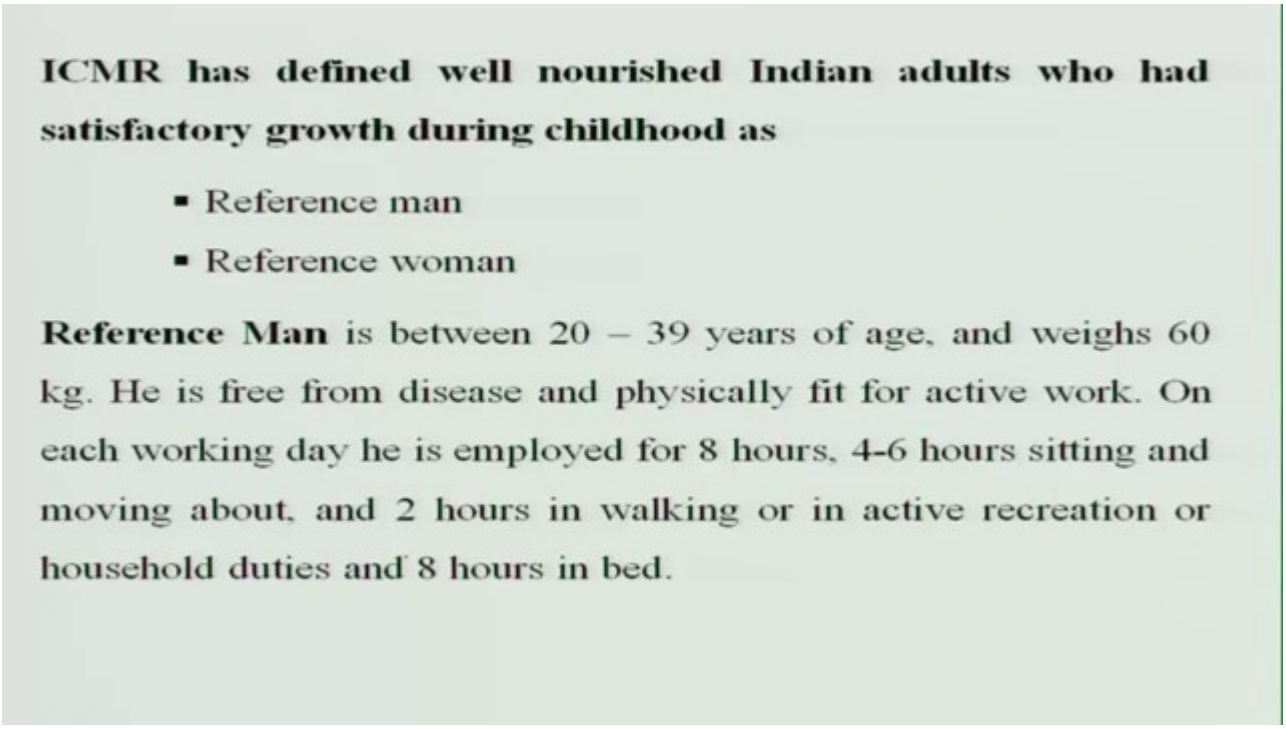

So ICMR has well-defined the Indian adults into who have a satisfactory growth from the childhood to and adulthood like as Reference Man and Reference Woman. Who is the reference man? A Reference Man is between the age of 20 to 39 years, weighs about 60 kgs of weight then he should be free from disease, physically fit for active work and on each day he should be employed for eight of us then four to six hours relaxing or sitting and moving about, then two hours he spends in active walking or recreation and household duties and eight hours in bed. So out of the 24 hours they are distributed like this. He is called a Reference Man.

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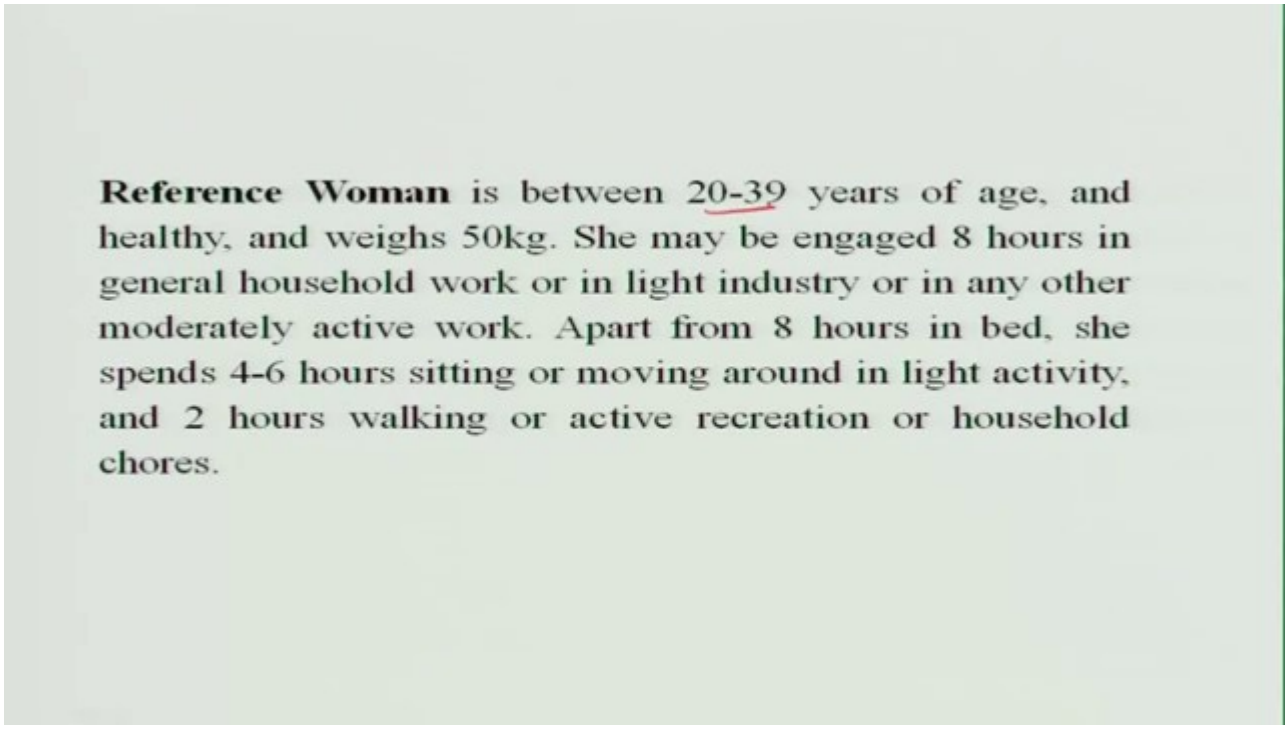

Similarly a Reference Woman is between the age of 20 to 39 years weighing 50 kgs, free from disease or healthy and again she is engaged in eight hours of general household work or light industry or any moderately active work then apart from eight hours in bed she will again spends four to six hours in a relaxing mood or moving around in light activity, two hours in walking or active recreation or household chores.

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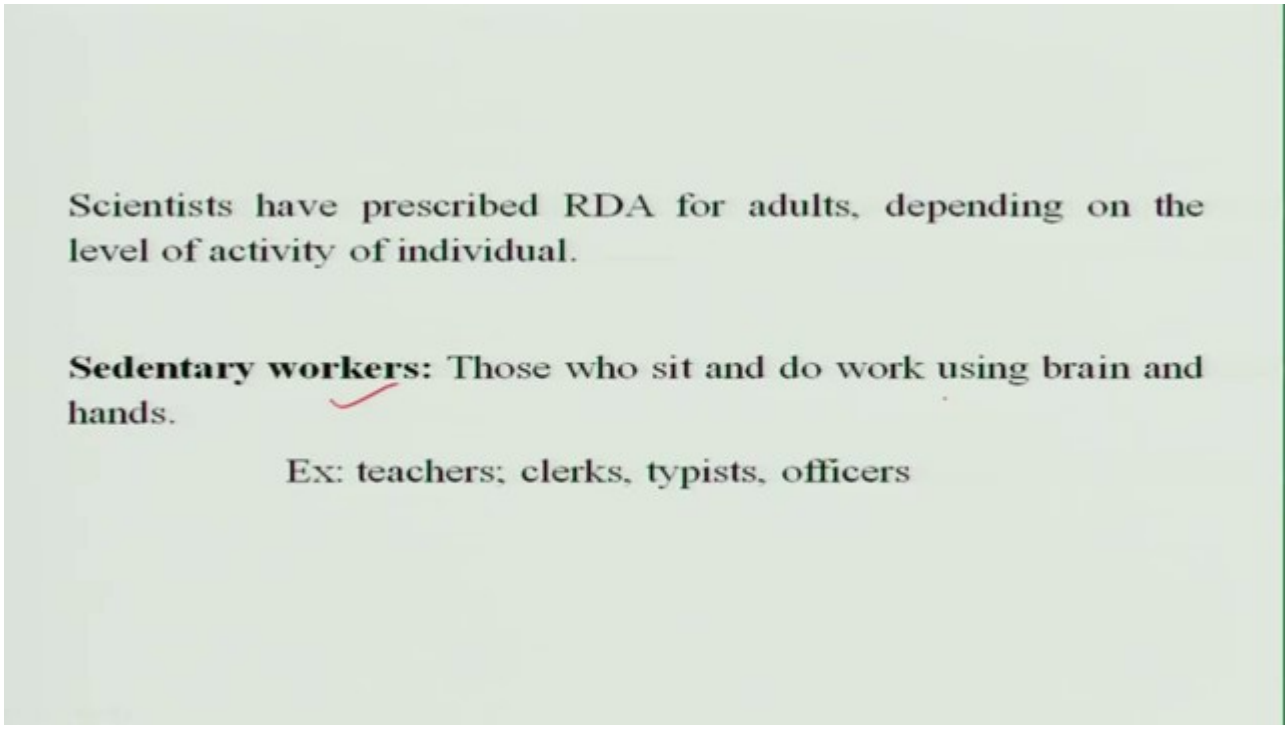

And again this is dependent on the type of activity. So I said sedentary worker, moderate worker and heavy worker. Who is a Sedentary Worker? Those who sit and do using brain and

hands, all the professionals who work on the table are sedentary workers. So teachers, clerks, typists and officers are classified under sedentary workers.
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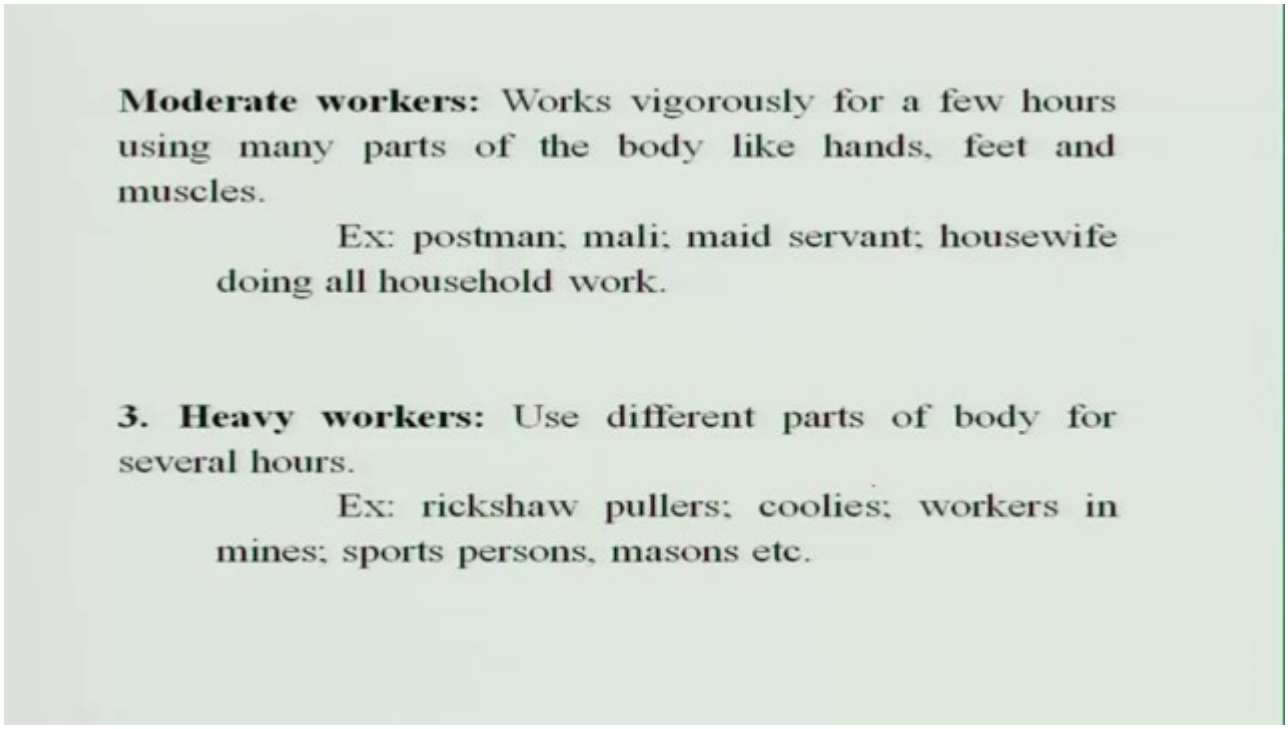

Then moderate workers. They work vigorously for a few hours using many parts of the body like hands feet and muscles. So, this example for these are postman, mali, maidservant who work vigorously for a few hours and housewife doing all the household chores. Heavy workers they use their different parts of the body for several hours. So they use all their parts of the body for several hours like rickshaw pullers, coolies, workers in the mine, sports, masons etcetera. So these will have different requirements for their nutrients.
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Energy: Only nutrient where extra allowances are not made. The energy requirements of an individual is the level of energy intake from food that will balance energy expenditure when the individual has a body size and composition and level of physical activity, consistent with long term good health that will allow for maintenance of economically necessary and socially desirable activity.

I was telling you that energy is the only nutrient where extra allowance is not given. So energy requirement for an individual is taken as the level of energy and take from the food which should balance the energy expenditure, intake and expenditure should be balanced. There should be no extra energy that is required. The person should not be in a positive energy balance. And when the individual has body size and composition, level of physical activity which is consistent with long term good health and allow for maintenance of economically necessary and socially desirable activity. That is the allowance for energy.

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The unit of energy is the Kilocalorie (kcal).

Recently, International Union of Sciences and International Union of Nutritional Sciences adopted "Joule" as unit of energy.

And the unit for energy is kilo calorie. But now recently the International Union of Sciences and International Union of Nutritional Sciences has adopted Joule as the unit of energy.
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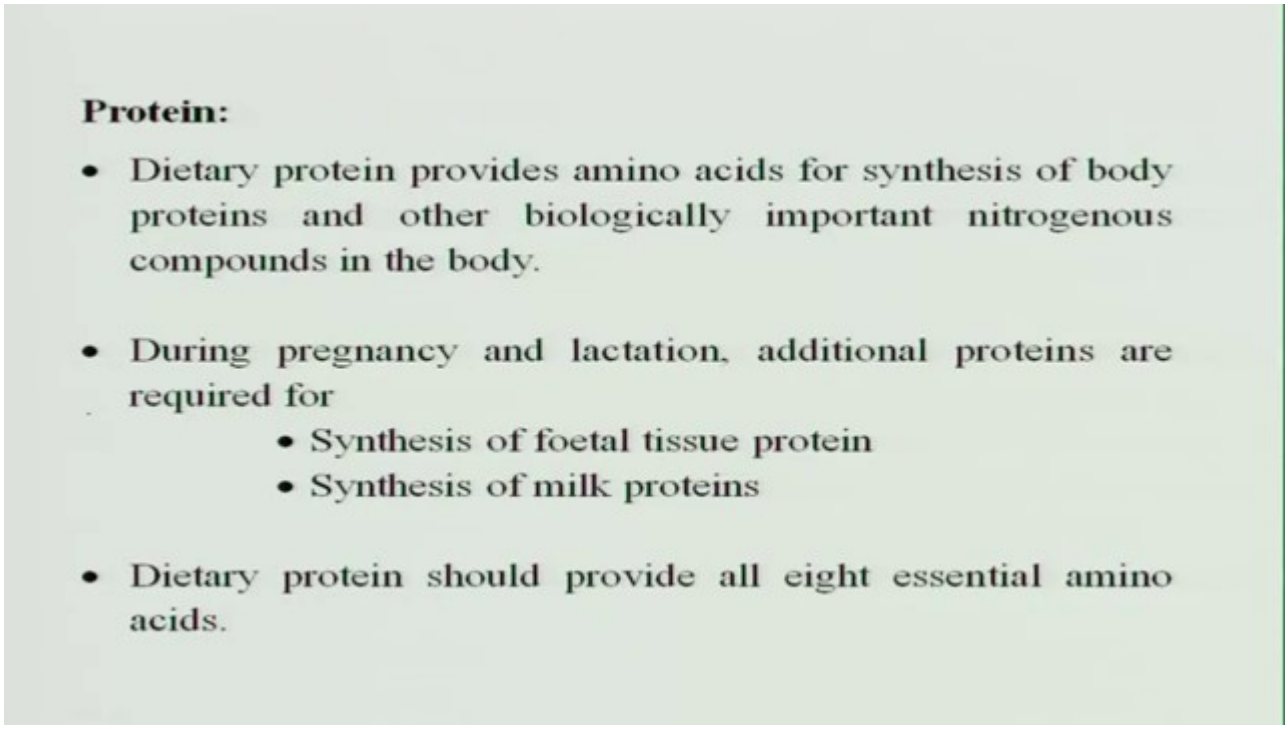

Protein as we were talking that dietary protein provides amino acids for the synthesis of body proteins and other biologically important nitrogenous compound in the body. So during pregnancy and lactation the individual requires additional protein requirement for the synthesis of the foetal tissue protein and the milk proteins, so dietary protein should provide all the eight essential amino acids.
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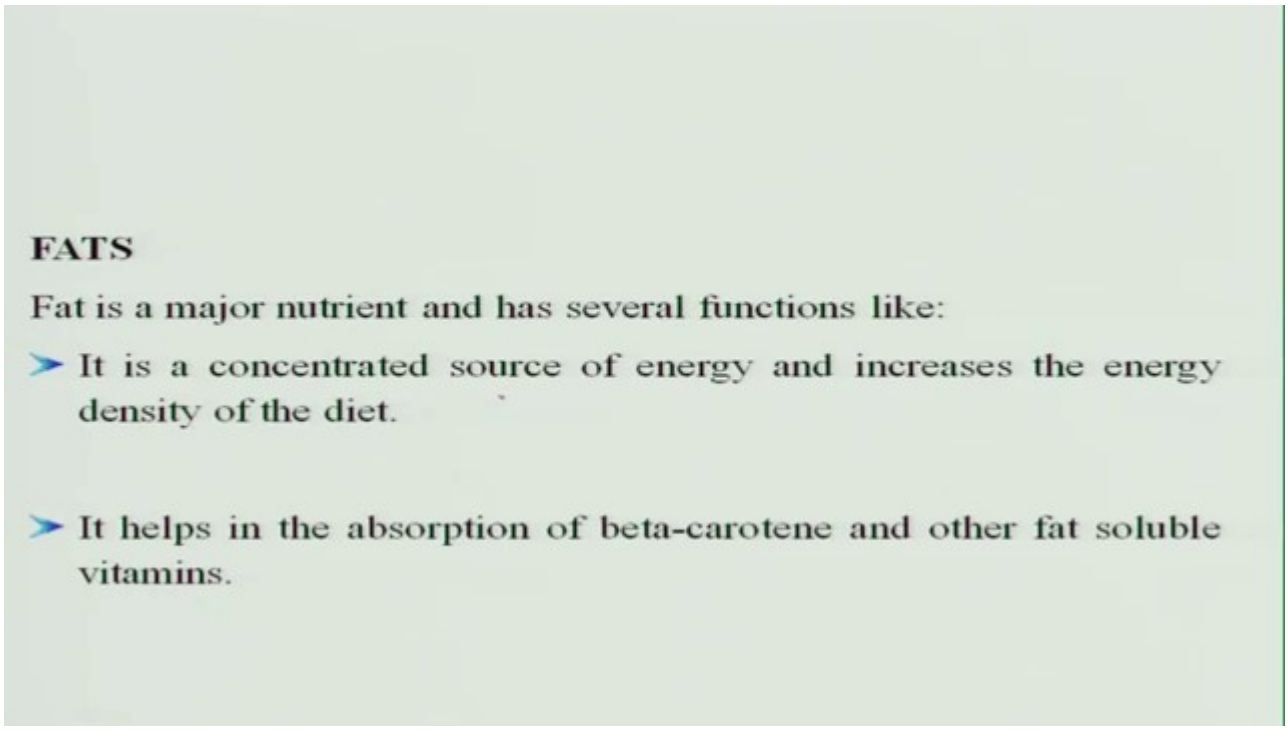

Fat, fat is the major nutrient and has several functions like it is a concentrated source of energy, increases the energy density of the diet. When you add the one or two spoons of fat I told you each gram provides 9 kilocalories of energy, so it will increase the energy density of the diet. And it helps in absorption of beta carotene and other fat soluble vitamins.
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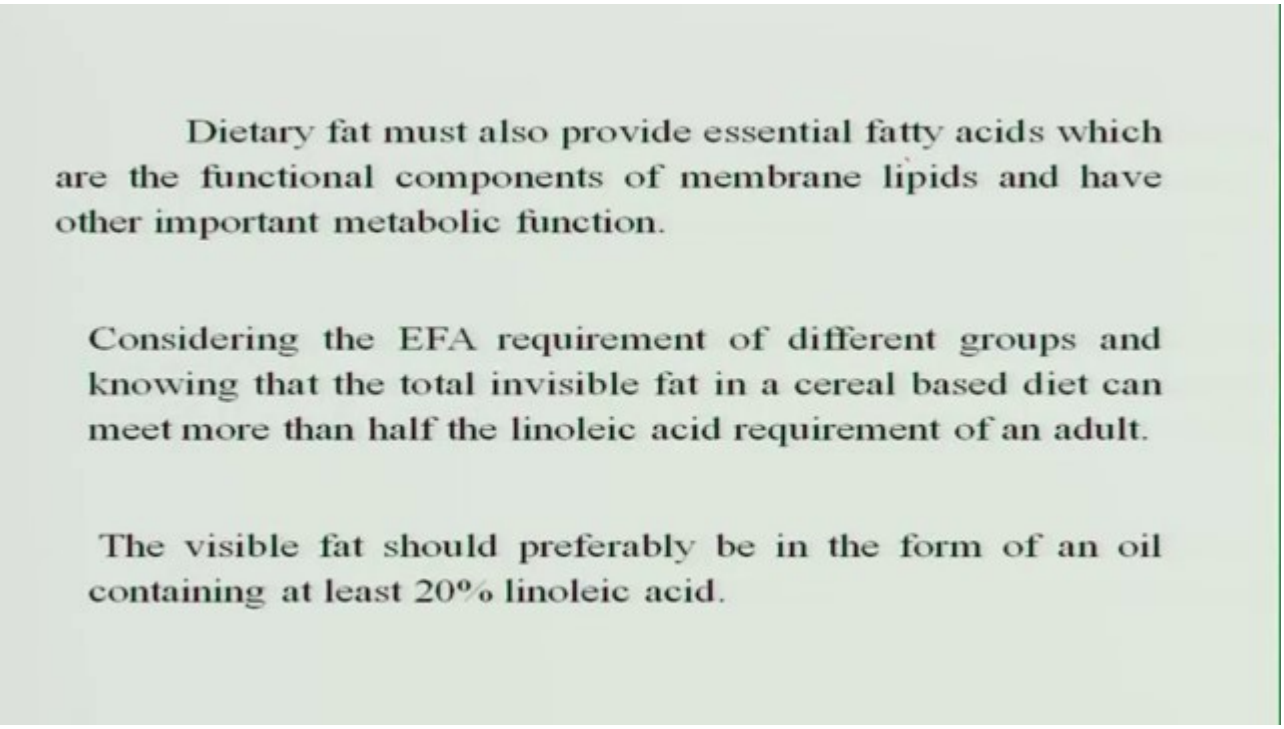

Dietary fat also provides essential fatty acids which are very important functional compounds of the epithelial cells or the lining of the cells and also very important for the metabolic functions. So considering the requirement of the essential fatty acids for different age groups and knowing that invisible fat, totally invisible fat is the fat that is present in the foods. So this is the invisible fat. So it can meet if we consume this the recommended amount of cereals it can meet more than half of the linoleic acid requirement. Linoleic acid is an essential fatty acid. So visible fat; visible fat is the actual fat which we add to the diet should be preferably in the form of an oil because oils contain essential fatty acids and it should at least it should contain 20% of linoleic acid.
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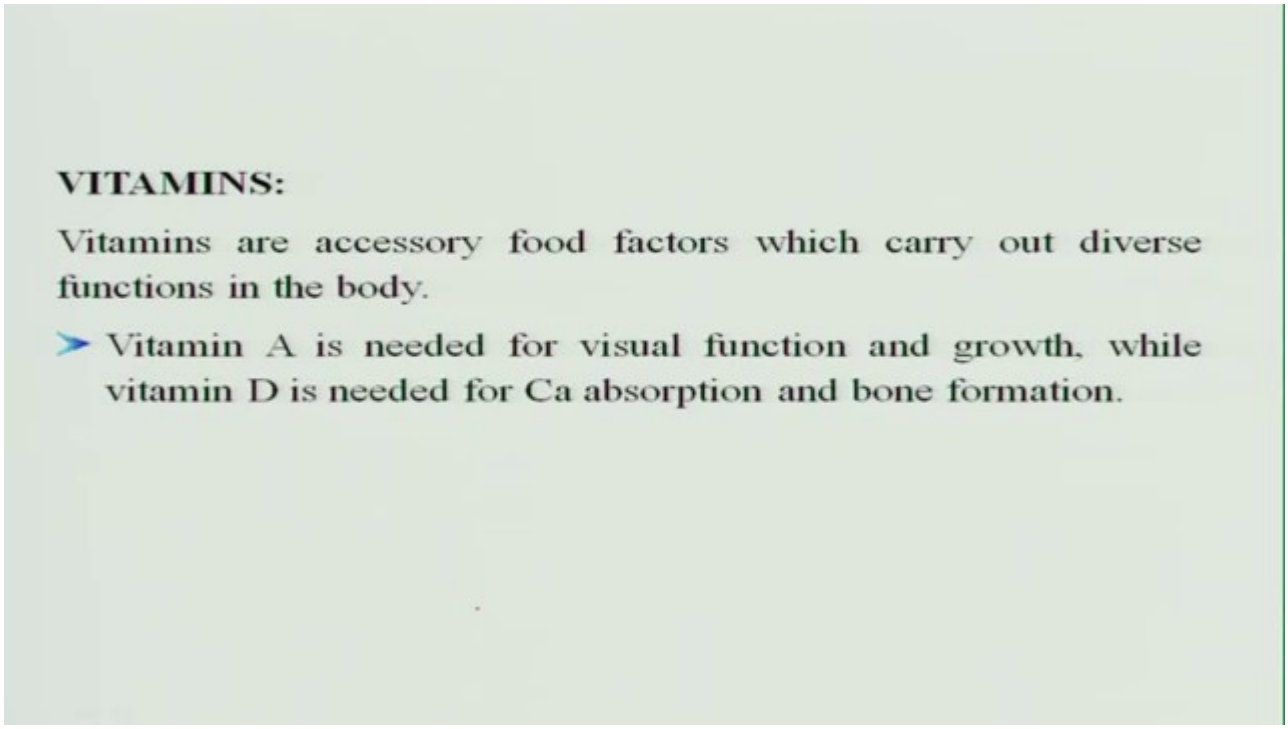

Now vitamins are accessory for factors. So the main nutrients are carbohydrates, proteins and fats and vitamins are accessory food factors which carry diverse functions in the body, so vitamin A is required for the visual function and growth, while vitamin D is required for calcium absorption and bone formation.

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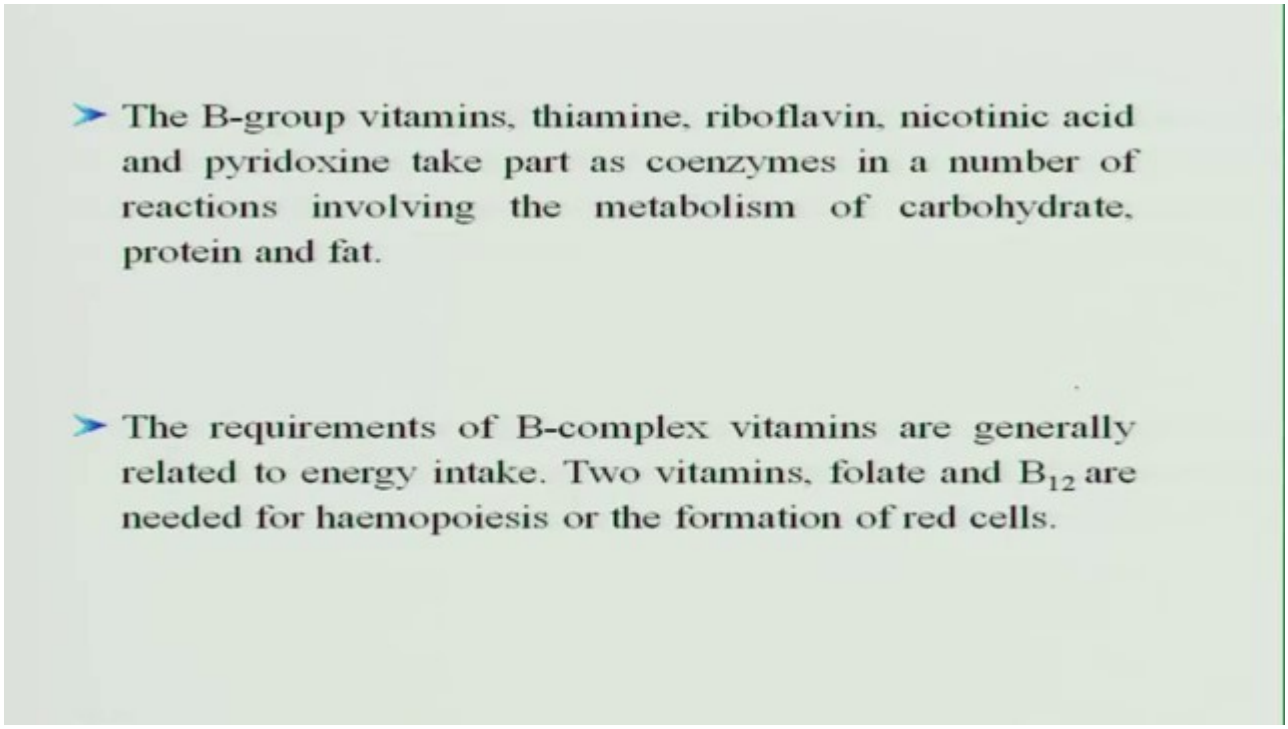

And the big group of vitamins that is thiamine, riboflavin, niacin, pyridoxine, biotin folic acid vitamin B12 et cetera they are take part as the coenzymes in a number of reactions involving in the metabolism of carbohydrate, protein and fat. So the requirement of B-complex vitamins are generally related to energy intake. So for example the niacin you require is for

every thousand kilocalories intake you require about 6.6 milligrams of niacin. Like that you these are related to thiamine, riboflavin, and niacin are related to the energy intake and pyridoxine is related to the protein intake. So two vitamins that is folate and B12 are needed for hemopoiesis, that is the production of RBCs in the blood.
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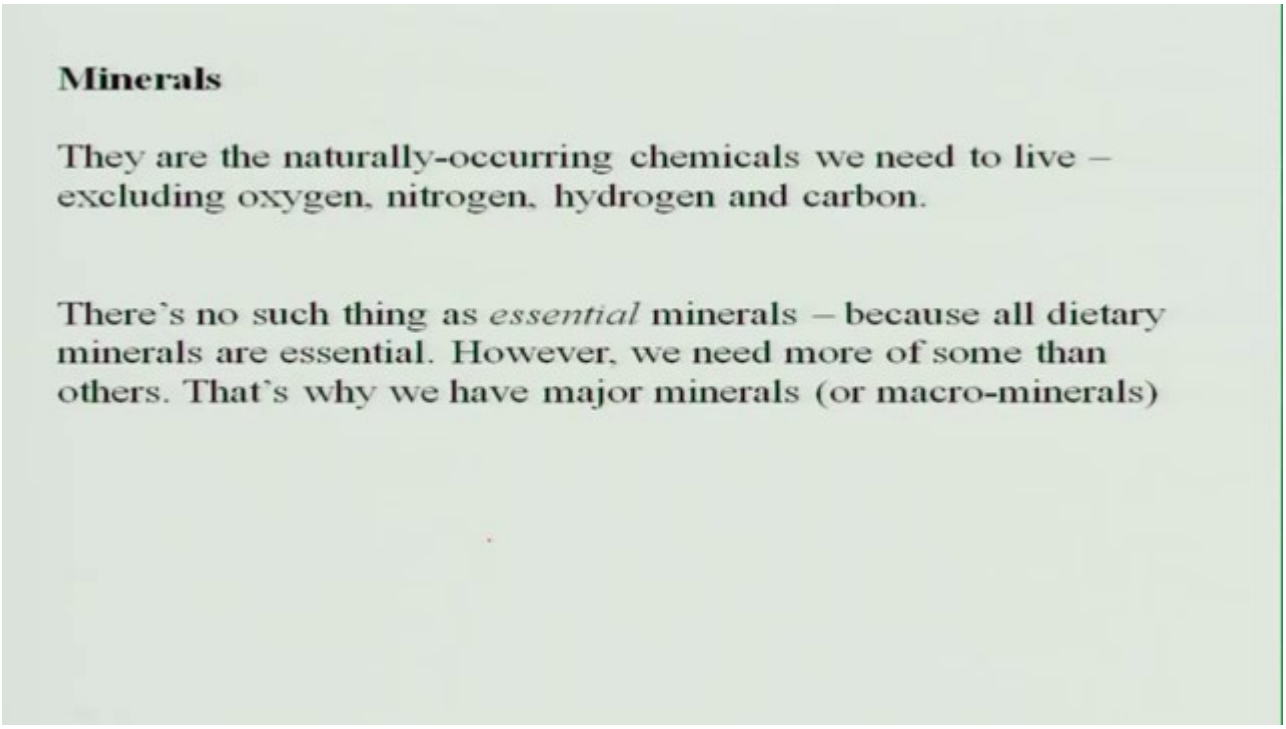

Then minerals; these are naturally occurring chemicals which we need to live and they are excluded of oxygen, nitrogen, hydrogen and carbon. So there is no such thing as essential nutrients because all the dietary minerals are essential. We don't have like essential fatty acids, essential amino acids we don't have essential minerals. Each and every mineral has a particular role in the body and they are very important. However we require some of them more than the others. The quantity that we require is different. That is why we can divide the minerals into major minerals and minor minerals.
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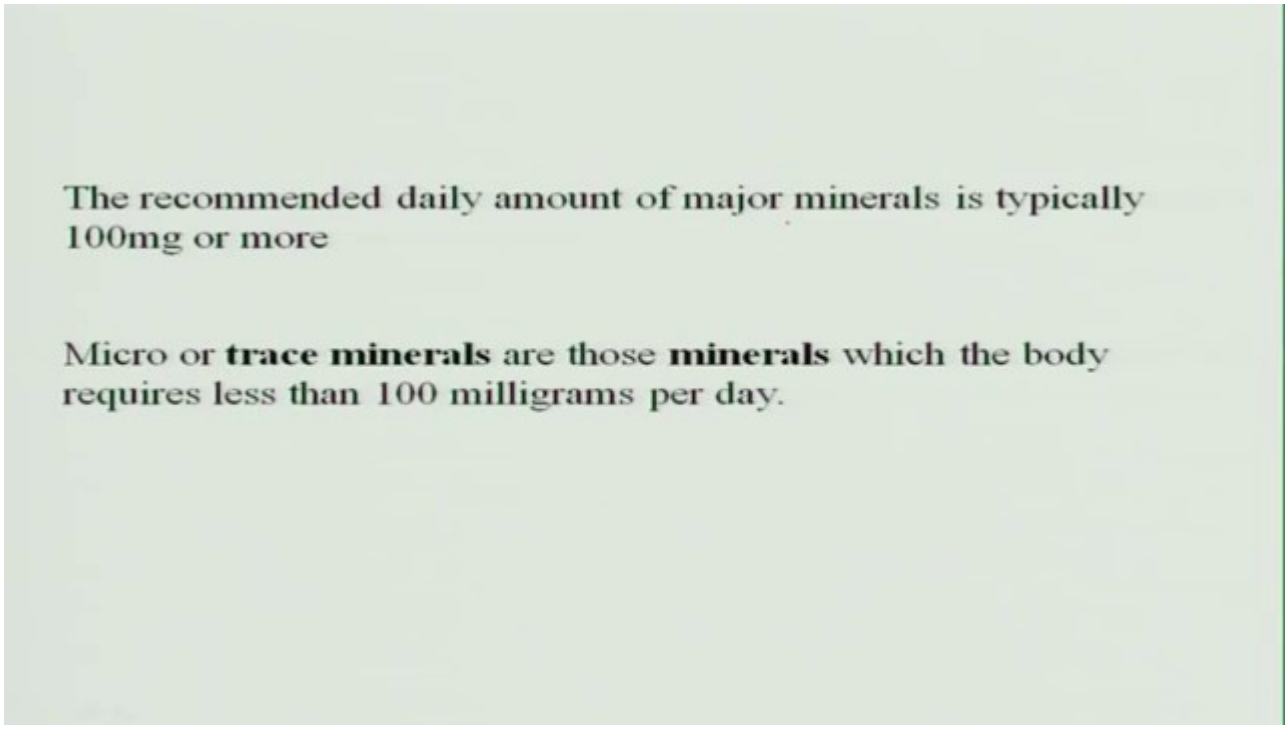

So the recommended amount of major minerals is more than 100 milligrams. Wherever we require minerals more than 100 milligrams like calcium that is called as the major mineral. Whereas micro or trace minerals are those minerals which we require in very small quantities that is less than 100 milligrams per day or sometimes even in micrograms which are called as trace minerals.

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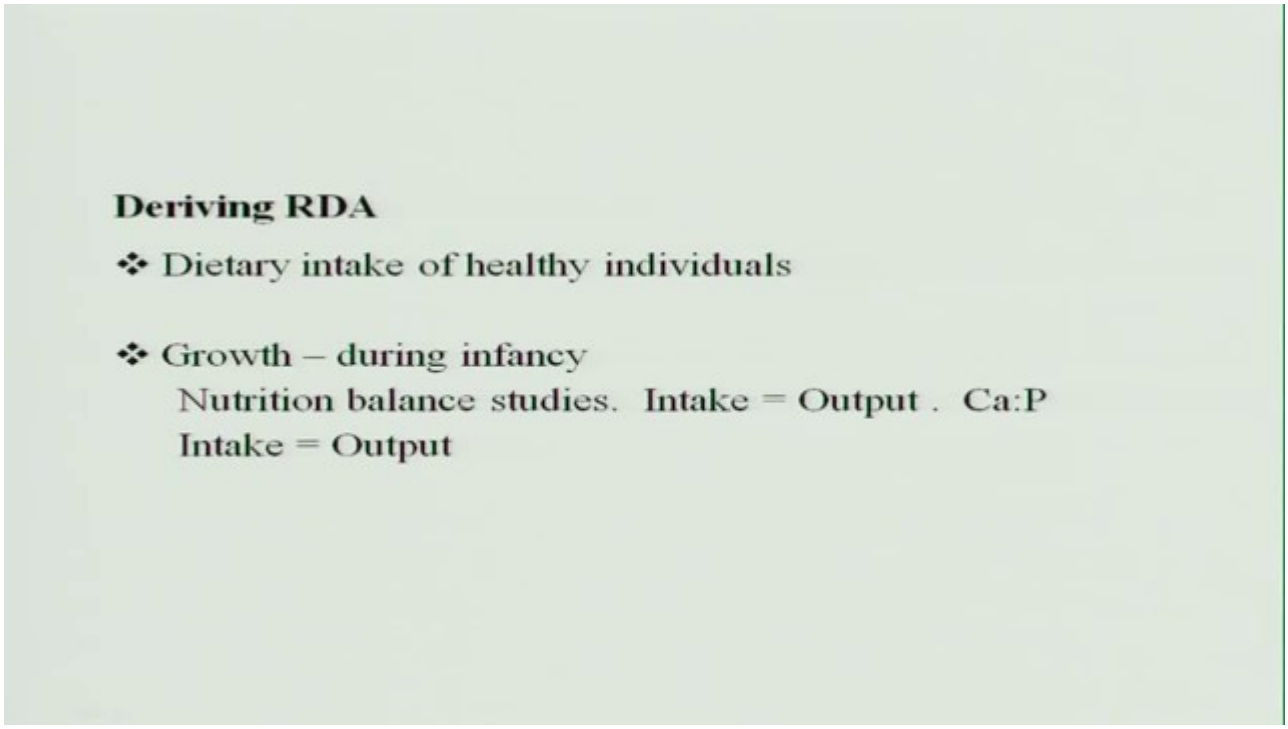

Now deriving the RDA dietary intake of the healthy individuals is taken on a large basis in the community. Then growth during infancy's very important which is taken into consideration. And nutrition balanced studies are done. That means they see what is the input

and what is the output. So for example calcium is to phosphorus, you take the input and output and then decide the recommended dietary allowances.
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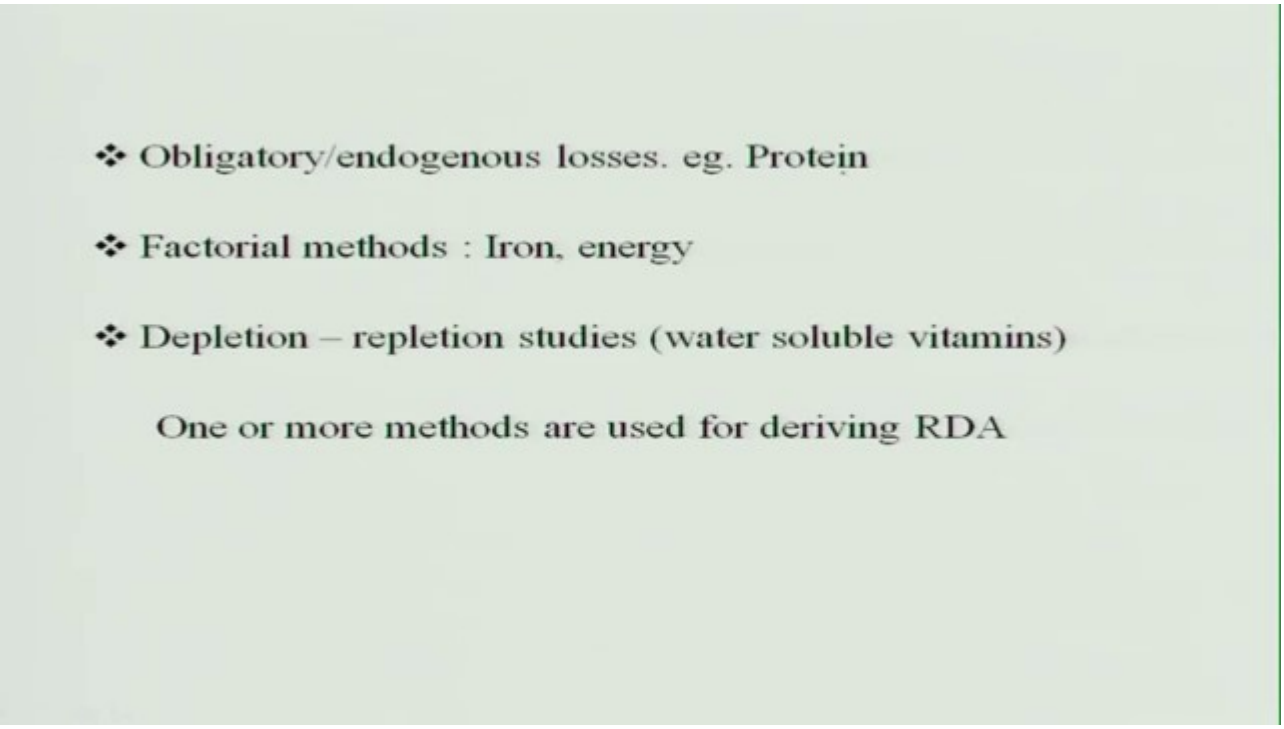

Then you see the obligatory or endogenous loss. So, even without any illness sometimes some amount of the nutrients are lost from the body they are called the endogenous loss or the obligatory loss that is taken into consideration. This is with regarding to protein. Then we have the factorial methods where you have different stages where iron is the absorption then bioavailability, all these are taken into consideration, the age, the activity et cetera. Then you have depletion-repletion studies because water soluble vitamins I told you when they are in excess they get excreted. So to know the requirement first you have to deplete the individual of whatever water soluble vitamins are present in the body and then replete, then you will know the exact amount. Once the amount of the nutrient reaches the optimum level the excess is excreted. So that is how they decide the requirement for water soluble vitamins.

So out of these one or more methods sometimes for some nutrient you require one method some requirement of two or three combined methods to decide the amount of nutrient requirement. So the one or more methods are used for deriving the RDA. So this class we have seen what is the requirement? I mean, how the RDAs derived? What is RDA and what is a Reference Man? Who is a reference woman? What are the various factors that are taken into consideration while deriving RDA? And how they derive RDA for each nutrient and what are the methods that are used to derive the RDA. Thank you.