Welcome to this module on concept of dietary reference intakes under the chapter nutrient requirements for Third yearBSc students .

In this module, we're going to look at some of the definitions and the concepts.The general principles which has been used for deriving human nutrient requirements and Concept on reference men and women.

At the end of this module , the students we should be able to give the macronutrient (carbohydrate, protein and fat requirements) and micronutrient requirements for different age groups and the student should also be able to differentiate between estimated average requirement and recommended dietary allowance.

Definitions

dietary reference intake- is a set of values for the dietary nutrient intake of healthy people for adequacy, optimal nutrition, as well as for prevention of chronic diseases.

Estimated average requirement- is the average dietary nutrient intake level estimated to meet the requirements of half of the healthy individuals in a particular lifestage and gender group. It is used primarily to evaluate populations or groups.

The Daily dietary nutrient intake level sufficient to meet the nutrient requirements of nearly all that is around 97 to 98% of healthy individuals in a particular lifestage and gender group is known as recommended dietary allowance. It is derived from estimated average requirement as the mean +2 standard deviations of the distribution of requirements and is used primarily to evaluate the individual diets. It is mandatory to remember here that RDA is inappropriate for dietary assessment of groups atis the at, as it is the intake level that exceeds the requirement of a large proportion of individuals within the group.

We have another concept which is tolerable upper level. we see lot of foods processed. Foods is undergoing fortification and hence we need to be well aware of the consequences of the fortificant which is used in case if it is done at an upper level. So it basically refers to the highest average daily nutrient intake level that is likely to pose no risk of adverse health effects to almost all individuals in the general population . Intake above the tolerable upper level will increase the risk of adverse effects.

It's also important for us to know the concept of adequate intake and these values are used when the estimated average requirement or recommended dietary allowance cannot be determined. It is the recommended acceptable daily intake level based on observed experimentally determined approximations or estimates of nutrient intake by a group of apparently healthy people that are assumed to be adequate.

We also have a concept of lower threshold intake which refers to a value derived from the estimated average requirement and is calculated as the ER minus 2 standard deviation of the distribution of requirements and is sufficient to meet the needs of the bottom 2% of individuals. However, countries have used a different cut offs such as five to 10% to evaluate nutrient insufficiency, although the concern is that these values would set a very low expectations of the individual nutrient intake adequacy level.

Why the nutrient requirements needs to be derived for humans. We know that nutrients are

components which enables to lead a healthy and active life. These nutrients are different or they vary for different physiological groups and can only be derived from a well balanced diet. For instance, adults require nutrients for maintenance of constant body weight and for ensuring proper body functions, whereas infants and young children grow rapidly and they require nutrients not only for maintenance but also for growth. In fact their requirement is 3 to five times more per Kg body weight in adults. Similarly, the most demanding stages, pregnancy and lactation, demand additional nutrients due to fetal growth and maternal tissue expansion and milk secretion during lactation , for normal growth of infants in utero and also during early postnatal life

Development of the nutrient requirements for Indians is a stellar contribution of the ICMR and National Institute of Nutrition. there are changing dietaey patterns and there are different factors responsible for this patterns, for instance,agricultural, economic, lifestyle factors, newer scientific evidence ,population based data, health and nutrition transitions and thus all this warrant timely revisions in recommendations. So RDA has become the guiding lights for evolving new and relevant strategies for tackling the scourge of dual malnutrition, associated noncommunicable diseases and micronutrient deficiencies across the country.
There are certain guidelines in arriving at nutrient requirements and dietary allowances for various groups,so they differ for a group or a population. Now for a group, it depends upon the age,body, weight and physiological and metabolic status of the individual. Where else, as far as guidelines for population is concerned, it also considers individual variation within the group quality of the diet,effect of cooking and processing, and. Bioavailability of the nutrient from the diet, so several methods have been employed over the years to arrive at the requirement of different nutrients for individuals dietary intakes. In general, the methods which are employed for requirements to be very brief are growth , nutrient balance studies, obligatory loss of nutrients, factorial approach,nutrient turnover, depletion and repletion.
It is important for us to know the definition of a reference Men and women, which has been considered in deriving the various nutrient requirements. So who is a reference Men and women?

He or she has to be 18 to 29years of **age** group. The **weigh**t is 65 kgs for males and 55kgs for females as well as the non pregnant non lactating mothers. The **height** of the male should be 1.77meters and for females it should be 1.62 meters. Any of this group should be **free from disease**. Should be physically **fit,** should be involved in eight hours of **occupation ,** has to be engaged in moderate **activity** and when not at work, the individual has to be 8 hours in **bed**, four to six hours in **sitting and moving,** about 2 hours of **walking** activity, active recreation and household work.

Here are the height and weight measures which has been proposed by ICMR and as you can see the proposed reference is 177 centimeters and 65 kgs for a male so as to have a BMI of 20.75, whereas for a female to have a normal BMI of 20.95, recommendation is for 162 centimeters of height and 55 kgs of weight .you can see this particular table which is giving the summary of the estimated average requirement for Indians as per the latest guidelines, that is 2020.

We know that the nutrient requirements are dependent on various factors. For example,the category of work, that is, whether you are so the entry ora moderate or a heavy worker, then the dim Andino in physiological conditions like pregnancy and lactation, it increases as you can see with regard to energy during pregnancy there is any additional requirement of plus 350 kilocalories, an it all of course depends on the gestational weight gain which we expect to know throughout the pregnancy of around on an average 12 kg , so we can see that there is a change in the energy requirement depending on the activity pattern. For instance, 2130 kilocalories for a sedentary man,whereas for a woman the calorie intake is much lesser. Similarly this particular table also gives you about a visible fat intake. The protein intake, the daily carbohydrate recommendation in fact, for the first time it has been given to us apart from the various minerals like calcium, magnesium, iron,zinc, iodine, thiamine, riboflavin,niacin, vitamin B6, folate,vitamin B12, vitamin C, vitamin A, and vitamin D.

Similarly, this table is as I've already told you, there is a difference in the estimated average requirement and theRDA So this particular table is summarizing the RDA for Indians and the nutrient components remain the same. This is a summary of recommended intakes for other minerals and trace elements. For instance,phosphorus, sodium, potassium,copper, manganese, chromium, and selenium, where in you can see the requirement, which is 1000milligrams, 2000 mg, 3500 mg 2mg, 4mg , 50 micrograms, and 40 micrograms, respectively, on daily basis.

We have some list of references. Which I would request. To go through and understand in depth the knowledge about why the requirement of different nutrients vary and the functions

of each and every nutrient will enable you to give a better perspective on the nutrient requirements which we can obtain actually from a good diet ...a balanced diet and it will enable us to maintain our good health and at the same time nutritional status.

Thank you very much.