



## **PHYSICAL EDUCATION**

**B. P. Ed. 3<sup>rd</sup> Year**

**B.P.Ed.4-IIIA2**

**Title: Health Education**

**TOPIC NO. 4**

**Nutrition**

**Lecture - 41**

**Balanced diet for Indian School Children and**

**Malnutrition and Adulteration of Food**

### **Introduction:**

A diet is said to be balance when it provide proper amount and proportion of various nutrients such as carbohydrate, fats, proteins, vitamins, mineral etc. according to the daily requirement of the individual.

In other word a balance diet is a nutrient in a definite proportion, the quantity of nutrients requirement to an athlete which may vary from fraction of the grams to 200 grams. But this requirement will vary according to their physique i.e. size and body weight and physical activity involvement.

We know that, the requirements of energy of a person gets from the diet which we consumed. However, the requirement is differ from individual to individual according to their body weight and activity involved.

The Personal energy requirement is based on Basal energy requirement and extra energy requirement. The Basal energy requirement is the energy required by an athlete or by an individual when he is in rest. In other word, we can say that it is the minimum energy required by a body.

For every kg of body weight 1.3 calories of energy is required every hour that we called it basal energy requirement.

**Extra energy requirement:** Extra energy requirement is the energy required during physical activities.

For each hour of training we require 8.5 calories of energy for each kg of body weight that we called it extra energy requirement.

So, we can summarize that:

**Personal energy requirement = Basal energy requirement (1.3 calories/kg/hour) + Extra energy requirement. (8.5 calories/kg/hour)**

From this, we can easily calculate the total energy required by an individual per day(24 hrs).

### **Energy yield amounts from the nutrients**

Energy yield is the energy provide in the calories per 1 gm.

**Carbohydrate:** 1 gm carbohydrate can produced 4 Cal of energy

**Fats:** 1 gm fat can produced 9 Cal of energy

**Protein:** 1 gm Protein can produced 4 Cal of energy.

Thus, we can easily calculate the carbohydrate, fats and proteins required by an athlete by simply dividing percentage of calories of total energy requirement divided by energy yield per gram.

If we consider an athlete weighing 67 kg, with two hours intense workout; the requirement in terms of carbohydrate, fats and proteins is given as.

**\*Carbohydrate** in calories: – 57% of 3229.4 = 1841 cal

Carbohydrate in grams:- 1841 cal at 4 cal/gm = **460gm.**

**\*Fats** in calories: – 30% of 3229.4 = 968.82 cal

Fats in grams:- 968.82 cal – at 9 cal/gm = **108 gm.**

**\*Protein** in calories: – 13% of 3229.4 = 419.8 cal.

Protein in grams: - 419.8 cal at 4 cal/gm = **105 gm.**

The concept of balance diet depends upon two major factors which are; i. Nutrients need and ii. Calorific needs.

- i. Nutrients need: - No single nutrient can supply 100% of calorific requirement instantly but a certain proportion should be derived from each of the following nutrients. 55 to 60% should be from carbohydrate, 25 to 30% from fat, and remaining 10 to 15% from protein. For example, an athlete which daily requirement is 6000 Kcal, should obtain 600 to 900 Kcal from proteins, 1500 to 1800 Kcal from fats and remaining 3300 to 3900 Kcal form the Carbohydrate.
- ii. Calorific needs: The calories taken from the food should be approximately equal to the calorific expenditure. Resulting from body maintenance and physical activities.

The energy need is directly related to the two period of rapid growth, age and physical activity in which an individual is engage.

Beside the above two factors the concept of balance diet depend on no. of meals. It has been suggested that eating fewer no. and larger meal per day impairs (harmed) the glucose tolerance and increases the body weight and fat contains of the body. Hence a very active person who requires 6000 Kcal/day may be advice to eat 5 or 6 meals as per the following pattern.

<b>Break fast</b>	<b>Snacks</b>	<b>Lunch</b>	<b>Snacks</b>	<b>Dinner</b>	<b>Snacks</b>
<b>670 Kcal</b>	490 Kcal	1510 Kcal	660 Kcal	1620 Kcal	1050 Kcal

### **A Healthy Diet for School-Going Children**

We know that a healthy diet for school-going children is essential for growth, learning, sport and activities, and in later years for puberty. But what exactly constitutes a healthy diet? How parents can ensure that the food given to their children both at home and school meets their nutritional needs?

Before we look at what a child should be eating, let's focus on mealtimes and eating habits: Children and teenagers should have 3 regular meals and 1-2 snacks each day to get the maximum amount of energy and nutrients which they require. Eating meals together with family is an important way of encouraging them to enjoy a variety of foods which helps to balance the diet.

Breakfast is the most important meal of the day as it helps stabilise blood sugar levels. There is also some evidence to suggest that adults and children who eat breakfast regularly are less likely to be overweight than those who don't. Many studies have found a positive relationship between eating breakfast and learning ability, attention span and general wellbeing.

From around the age of five years children should be follow the principles of healthy eating which are recommended for adults. The eatwell plate developed by the Food Standards Agency in the UK, shows the types and proportions of foods needed for a healthy balanced diet. It is not necessary to achieve this balance at every single meal however this should be the aim over a week or month.

### **Malnutrition:**

Malnutrition is caused by eating a diet in which nutrients are not enough or are too much such that it causes health problems. It is a category of diseases that includes undernutrition and overnutrition. Overnutrition can result in obesity and overweight.

Malnutrition; however, is frequently used to mean just undernutrition. Undernutrition is sometimes used as a synonym of **protein energy malnutrition**.

Undernutrition encompasses stunting, wasting, and deficiencies of essential vitamins and minerals (collectively referred to as micronutrients). The term hunger, which describes a feeling of discomfort from not eating, has been used to describe undernutrition, especially in reference to food insecurity.

The term "severe malnutrition" or "severe undernutrition" is often used to refer specifically to **Protein Energy Malnutrition (PEM)**. PEM is often associated with micronutrient deficiency. Two forms of PEM are kwashiorkor and marasmus, and they commonly coexist.

Kwashiorkor ('displaced child') is mainly caused by inadequate protein intake resulting in a low concentration of amino acids. The main symptoms are edema, wasting, liver enlargement, hypoalbuminaemia, steatosis, and

possibly depigmentation of skin and hair. Kwashiorkor is identified by swelling of the extremities and belly, which is deceiving of actual nutritional status.

Marasmus ('to waste away') is caused by an inadequate intake of protein and energy. The main symptoms are severe wasting, leaving little or no edema, minimal subcutaneous fat, severe muscle wasting, and non-normal serum albumin levels. Marasmus can result from a sustained diet of inadequate energy and protein, and the metabolism adapts to prolong survival. It is traditionally seen in famine, significant food restriction, or more severe cases of anorexia. Conditions are characterized by extreme wasting of the muscles and a gaunt expression.

The World Bank estimates that India is one of the highest ranking countries in the world for the number of children suffering from malnutrition.

The 2011 Global Hunger Index (GHI) Report ranked India 15th, amongst leading countries with hunger situation.

India is one of the fastest growing countries in terms of population and economics, sitting at a population of 1.2 billion and growing at 10–14% annually (from 2001–2007). India's Gross Domestic Product growth was 9.0% from 2007 to 2008; since Independence in 1947, its economic status has been classified as a low-income country with majority of the population at or below the poverty line.

### **Food adulteration**

Food is adulterated to increase the quantity and make more profit. The food is sucked of its nutrients and the place where the food is grown is often contaminated. For example: Milk is mixed with water. Vanaspati is used as an adulterant for ghee. Ergot is used as an adulterant for cereals. Chalk-powder is used as an adulterant for flour. Chicory is used as an adulterant for coffee. Papaya seeds are used as an adulterant for pepper. Brick-powder is used as an adulterant for chilly-powder. Tamarind seed powder is used as adulterant for coffee. Wood powder is adulterated for turmeric and dhaniya powder.

### **Some Adulterated Foods which are especially linked with children:**

1. Turmeric, dals and pulses such as moong and channa: Here adulterant is Metanil Yellow and Kesari Dal (Added to enhance the yellow colour of a food substance). Its harmful effect is that it is highly carcinogenic and if consumed over a continuous period of time it can also cause stomach disorders.

2. Green chillies, green peas and other vegetables: Here adulterant is Malachite Green (used to accentuate the bright, glowing green colour of the vegetable). Argemone seeds (used to add bulk and weight) that it is a coloured dye that has proven to be carcinogenic for humans if consumed over a long period of time.

3. Mustard seeds and mustard oil: Here adulterant is Argemone seeds (used to add bulk and weight). Papaya seeds (used to add bulk) that the consumption of these could cause epidemic dropsy and severe glaucoma.

4. Paneer, khoya, condensed milk and milk: Here adulterant is starch (used to give it thick, rich texture). Its harmful effect is that it is unhygienic, unprocessed water and starch can cause stomach disorders. Starch greatly reduces the nutritional value of the ingredient.

5. Ice cream: Here adulterant is pepper oil, ethyl acetate, nitrate, washing powder etc. are not less than poison. Pepper oil is used as a pesticide and ethyl acetate causes terrible diseases affecting lungs, kidneys and heart.

Ice cream is manufactured in extremely cold chamber where fat is hardened and several harmful substances are added. Also a kind of gum is added which is sticky and slow melting. This gum is obtained by boiling animal parts like tail, the nose, the udder etc.

Food-preservatives have a very extensive use, which often constitutes adulteration. Salt is the classic preservative, but is seldom classified as an adulterant. Salicylic, benzoic, and boric acids, and their sodium salts, formaldehyde, ammonium fluoride, sulphurous acid and its salts are among the principal preservatives. Many of these appear to be innocuous, but there is danger that the continued use of food preserved by these agents may be injurious.

**Conclusion:**

A diet is said to be balanced when it provides proper amount of and proportion of various nutrients such as carbohydrates, fat, proteins, vitamins and minerals etc. according to daily requirement of an individual. School going children needs more protein for proper growth and development than adult. So, we should provide sufficient protein requirement. Malnutrition is a disease, which is caused by either lack or excess of nutrients, it covered both under nutrition and over nutrition. There is again issue of food adulteration, some of the food items that are available in market are adulterated. This is being done to make more profit. The adulterated foods lack nutrients and even the place where the food is grown is often contaminated.

In this discussion, I had mentioned many food items that are adulterated. Therefore, one needs to be careful and act with caution while buying a food item from the market. A diet should be taken, keeping in mind the factor such as nutritional needs and calorific needs that a body required.