
بسم الله الرحمن الرحيم
In the name of ALLAH
the most Beneficent and the most merciful

NUTRITION AND HEALTH-6

NUTRITIONAL REQUIREMENTS

NUTRITIONAL REQUIREMENTS

The science of human nutrition is mainly concerned with defining the nutritional requirements for the protection, promotion and maintenance of health in all groups of population, including:

NUTRITIONAL REQUIREMENTS

- Infants
- Children,
- Adolescents,
- Adults of both sexes
- During pregnancy & lactation in women.

NUTRITIONAL REQUIREMENTS

RECOMMENDED DAILY ALLOWANCE (RDA)

- It is the amount of nutrient sufficient for maintenance of health in nearly all people
- Estimates of allowance are based on the defined minimum requirement plus a safety margin, for individual variation and stresses of everyday life

NUTRITIONAL REQUIREMENTS

RECOMMENDED DAILY ALLOWANCE (RDA)

- These are reference standards of nutritional intakes
- The recommendation is estimated to meet the requirement of practically all healthy people, but not the sick people

NUTRITIONAL REQUIREMENTS

ENERGY

- Food is the source of all energy
- Energy is a prime requisite for body functions and growth
- If food intake in a child falls below a standard reference, growth slows. If low level persists, adult stature will be reduced

NUTRITIONAL REQUIREMENTS

ENERGY

- If adults fail to meet their food requirements, they lose weight.
  This may lead to:

a. Reduced ability to work
b. Reduced ability to resist infection &
c. Weakened will, to enjoy normal satisfaction of life

NUTRITIONAL REQUIREMENTS

ENERGY

- Energy value of foods is expressed in terms of '**Kcal**' or '**joule**' denoted by capital '**C**' and '**J**'

1 Kcal = 4184 Joule

NUTRITIONAL REQUIREMENTS

ENERGY

- Dietary sources of energy are **proteins, fats** and **carbohydrates** which yield 4, 9 and 4 Kcal of energy per gram respectively

NUTRITIONAL REQUIREMENTS

ENERGY REQUIREMENTS

Energy requirements of an individual might be defined as 'that level of energy intake in relation to expenditure, which is least likely to result in obesity or heart disease or which is most likely to prolong active life'.

ENERGY REQUIREMENTS

It is made up of three components:

a) Energy required for basal metabolism (1 Kcal /hour/KG body weight in adults)

ENERGY REQUIREMENTS

b) Energy required for daily activities such as walking, sitting, standing, climbing stairs, dressing etc.

c) Energy required for occupational work, which may be light, moderate and heavy

ENERGY REQUIREMENTS

- Energy requirement varies from one person to another, depending upon:

1.Age 2.Sex 3.Working condition	4.Body composition 5.Physical activity 6.Physiological state

ENERGY REQUIREMENTS

- **VULNERABLE GROUPS**

a) ***Pregnant mothers*** require *additional* 350 Kcal throughout pregnancy
Lactating mothers require *additional* 600 Kcal during 1st six months and

520 Kcal during next six months

ENERGY REQUIREMENTS

- **VULNERABLE GROUPS**

b) Children: Because of their rapid growth rate, they require proportionately more energy for each KG of body weight than adults

ENERGY REQUIREMENTS

c) ***Adults*** **:** Energy requirements decrease with increasing age, because of decrease in physical activity in most persons. The WHO committee suggested that after the age of 40 years, requirements should be reduced by 5 % per each decade until the age of 60 and by 10 % for each decade thereafter

RECOMMENDED DAILY INTAKE OF ENERGY

GROUP	ENERGY REQIREMENTS
Infants 0 – 5 months	92 Kcals/Kg Body Weight
Infants 6 – 11 months	80 Kcals/Kg Body Weight

RECOMMENDED DAILY INTAKE OF ENERGY

GROUP	ENERGY REQIREMENTS
Children 1 – 3 years	1060 Kcals
Children 4 – 6 years	1350 Kcals
Children 7 – 9 years	1690 Kcals

RECOMMENDED DAILY INTAKE OF ENERGY

GROUP		ENERGY REQIREMENTS
Adolescents	10 – 12 years	Males 2190
Adolescents	13 – 15 years	Males 2750
Adolescents	16 – 18 years	Males 3020
Adolescents	10 – 12 years	Females 2010 Kcals
Adolescents	13 – 15 years	Females 2330 Kcals
Adolescents	16 – 18 years	Females 2440 Kcals

RECOMMENDED DAILY INTAKE OF ENERGY

GROUP	ENERGY REQIREMENTS
ADULTS	
▪ **MALES**	**Kcals**
a. Light work	2320
b. Moderate work	2730
c. Heavy work	3490

RECOMMENDED DAILY INTAKE OF ENERGY

GROUP	ENERGY REQIREMENTS
ADULTS	
▪ **FEMALES**	**Kcals**
a. Light work	1900
b. Moderate work	2230
c. Heavy work	2850

PROTEIN REQUIREMENT

- It varies from individual to individual
- Factors like age, sex, physiological states, infection, worm infestation, emotional disturbances and stress situations can affect a person's protein requirement

PROTEIN REQUIREMENT

- Protein requirements of women are increased during pregnancy by 1, 3 and 23 g/day in 1st, 2nd and 3rd trimester respectively and during lactation by about 13 g/day over and above normal requirement.

ASSESSMENT OF PROTEIN

- The quality of a protein is assessed by comparison to the 'reference protein' which is usually egg protein
- Two methods of assessment of proteins are

i. Amino acid score
ii. Net Protein Utilization (NPU)

ASSESSMENT OF PROTEIN

AMINO ACID SCORE

It is a measure of the concentration of each essential amino acid in the test protein expressed as a percentage of that amino acid in the reference protein

$$AAS = \frac{\text{mg of amino acid/g of test protein}}{\text{mg of amino acid/g of reference protein}} \times 100$$

PROTEINS

NET PROTEIN UTILIZATION (NPU)

It is the "proportion of ingested protein that is retained in the body for the maintenance and growth of tissues"

PROTEIN REQUIREMENTS

1 G Protein / KG Body weight / day

PROTEIN REQUIREMENT

- Children require proportionately more proteins/each Kg body weight than adults and they are more vulnerable to malnutrition
- Protein utilization is less efficient in elderly

PROTEIN REQUIREMENT

- If total energy intake is inadequate, some dietary protein will be used to provide energy
- New tissues cannot be formed unless all Essential Amino Acids are present in diet

NUTRITIONAL REQUIREMENTS

FATS

- During infancy, fats contribute to a little over 50% of the total energy intake
- Fats should constitute about 20% of our energy intake in adulthood
- 50% of fat intake should consist of vegetable oils rich in essential fatty acids

NUTRITIONAL REQUIREMENTS

CARBOHYDRATES

- The recommended intake of carbohydrates in balanced diet is placed so as to contribute between 50%-80% of total energy intake

NUTRITIONAL REQUIREMENTS

- **Fat soluble and water soluble vitamins**

These should be taken in the required amounts e.g.

Thiamine	0.5mg/1000Kcal energy intake
Riboflavin	0.6mg/1000Kcal energy intake
Niacin	6.0mg/1000Kcal energy intake

BALANCED DIET

- A 'BALANCED DIET' contains a variety of foods in such quantities and proportions that the need for energy, amino acids, vitamins, minerals, fats, carbohydrates and other nutrients is met adequately, for maintaining health, vitality and general well-being

BALANCED DIET

- In constructing balanced diet, the following ***principles*** should be born in mind

a) Daily requirement of protein should be met (10-15% of energy intake)

b) Fats should be limited to 15-30%

BALANCED DIET

c) Carbohydrates rich in natural fiber should constitute the remaining bulk

d) For good health, one needs all food groups

BALANCED DIET

- Dietary pattern depends upon climate, economic capacity, religion, customs, taboos, tastes and habits of people

BALANCED DIET

- **Diet should be adapted** to the special needs of growth, pregnancy, lactation, physical activity and various medical disorders (e.g. diabetes, hypertension, gout etc.)

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