

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

In the name of **ALLAH**
the most Beneficent and the most merciful

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
In the name of ALLAH



NUTRITION AND HEALTH-1

**INTRODUCTION; NUTRIENTS;
PROTEINS**

NUTRITION AND HEALTH

- **NUTRITION**

“It is the science of food and its relationship to health; concerned primarily with the part played by food factors in body’s growth, development and maintenance”.

NUTRITION AND HEALTH

- **NUTRIENTS (FOOD FACTORS)** These are specific dietary constituents like proteins, vitamins, fats etc.
- **DIETETICS** is the practical application of the principles of nutrition; it includes planning of meals for the well and the sick.

NUTRITION AND HEALTH

- **GOOD NUTRITION**

It means “maintaining a nutritional status that enables us to grow well and enjoy good health”.

NUTRITION AND HEALTH

- The subject of **NUTRITION** includes:
 1. Dietary constituents
 2. Nutritional requirements
 3. Assessment of nutritional status
 4. Nutritional problems in public health
 5. Nutritional programs

NUTRITION AND HEALTH

- Since ancient times food has been recognized as important, for human beings, in health and disease.
- History of man to a large extent has been a struggle to obtain food.

NUTRITION AND HEALTH

- In early 19th century, proteins, carbohydrates and fats had been recognized as energy-yielding foods
- Vitamins were discovered at the turn of 20th century

NUTRITION AND HEALTH

- By 1950 all the presently known vitamins and essential amino acids had been discovered.
- Great advances have been made during past 50 years in the knowledge of nutrition and its practical application.

NUTRITION AND HEALTH

- Specific nutritional diseases were identified & technologies developed to control them as for example PEM, nutritional anaemia, endemic goitre, nutritional blindness etc.

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- Despite increased food production and its availability, poorer sections of population continue to suffer from malnutrition (which is a cause of social problems)



NUTRITION AND HEALTH

- The association of nutrition with infection, immunity, fertility, maternal and child health & family health has engaged scientific attention.

NUTRITION AND HEALTH

- More recently focus has been on the role of nutrients in the pathogenesis of non-communicable diseases e.g. coronary heart disease, diabetes, hypertension, cancer etc.

NUTRITION AND HEALTH

- Nutritional problems are not just medical problems but are multifactorial, with roots in other sectors.
- Improvement in health and nutritional status of people can be brought about only through a successful attack on basic problems of poverty & injustice.

NUTRITION AND HEALTH

- Emphasis is on integrating nutrition with Primary Health Care (PHC) system. Promotion of proper nutrition is one of the eight elements of Primary Health Care.
- Nutrition is the cornerstone of the socioeconomic development.

NUTRITION AND HEALTH

CLASSIFICATION OF FOODS

1. Classification by origin

a- Foods of animal origin

b- Foods of plant/vegetable origin

NUTRITION AND HEALTH

CLASSIFICATION OF FOODS

2. *Classification by chemical composition*

a- Proteins

b- Fats

c- Carbohydrates

d- Vitamins

e- Minerals

NUTRITION AND HEALTH

3. *Classification by predominant functions*

a- Body-building foods e.g. milk, meat, poultry, fish, eggs, pulses, nuts etc.

b- Energy giving foods e.g. sugars, fats, oils, cereals, roots and tubers etc.

c- Protective foods e.g. vegetables, fruits.

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4. *Classification by nutritive value*

Cereals and millets

Pulses (legumes)

Vegetables

Fruits

Nuts and oilseeds

Fats and oils

Animal foods

Sugar and jaggery

Condiments and spices

Miscellaneous foods

NUTRITION AND HEALTH

NUTRIENTS

These are inorganic and organic complexes which form constituents of food.

- There are about 50 different nutrients, having specific functions in the body.

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NUTRIENTS

- Most natural foods contain more than one nutrients.
- These are classified into
 1. MACRONUTRIENTS
 2. MICRONUTRIENTS

NUTRITION AND HEALTH

1. MACRONUTRIENTS

These include proteins, carbohydrates and fats & form main bulk of food. These contribute to the total energy intake in the following proportions in our diet

Proteins	7-15 %
Fats	10-30 %
Carbohydrates	65-80 %

NUTRITION AND HEALTH

2. MICRONUTRIENTS

These include vitamins & minerals.
These are required in small amounts
varying from traces to several grams.

PROTEINS

Proteins are complex, organic, nitrogenous compounds composed of carbon, hydrogen, oxygen, nitrogen and sulphur in varying amounts. Some proteins also contain phosphorus, iron and other elements. Nitrogen amounts to about 16%. Proteins constitute about 20% of body weight in adults.

PROTEINS

AMINO ACIDS

Proteins are made up of smaller units called amino acids. Some 20 amino acids are needed by human body.

ESSENTIAL AMINO ACIDS (EAA)

Out of 20 amino acids, 9 are called 'essential' because body cannot synthesize these, in amounts, corresponding to its needs.

PROTEINS

ESSENTIAL AMINO ACIDS (EAA)

These must be obtained from dietary proteins.

These are:

- **Lysine**
- **Leucine**
- **Isoleucine**
- **Methionine**
- **Threonine**
- **Phenylalanine**
- **Valine**
- **Histidine**
- **Tryptophan**

PROTEINS

- Cystine and tyrosin are 'essential' for premature babies.
- Both essential and non essential amino acids are needed for synthesis of tissue proteins.

PROTEINS

- Some of the Essential Amino Acids have important biological functions in the body e.g.
- Formation of niacin from tryptophan
- Methionine is needed for synthesis of choline, folates and nucleic acids.

PROTEINS

- A protein is said to be “**biologically complete**” if it contains all the Essential Amino Acids in amounts corresponding to human needs.

PROTEINS

- Animal proteins are rated superior to vegetable proteins because these are biologically complete. For example milk & egg proteins have a pattern of amino acids considered most suitable for humans

FUNCTIONS OF PROTEINS

- Body building
- Repair & maintenance of body tissues
- Synthesis of certain substances like antibodies, plasma proteins, enzymes, hemoglobin, hormones & coagulation factors.

FUNCTIONS OF PROTEINS

- Maintenance of osmotic pressure
- Proteins can also supply energy (4 kcal per one gram) when calorie intake is inadequate, but this is not their primary function. It is considered wasteful if proteins were used for such a purpose

SOURCES OF PROTEINS

- **ANIMAL SOURCES** e.g., milk, meat, egg, cheese, fish and fowl are all biologically complete.

Egg proteins are considered to be the best among food proteins because of their high biological value and digestibility. (“reference protein”)

SOURCES OF PROTEINS

- **VEGETABLE SOURCES** e.g., pulses, beans, nuts, cereals etc. All of these are poor in Essential Amino Acids.
- Cereal proteins are deficient in *lysine* & *threonine*; and pulse proteins are deficient in *methionine*

SOURCES OF PROTEINS

- When two or more vegetable foods are eaten together, their proteins supplement one another & provide a protein comparable to animal protein in respect of Essential Amino Acids.
- This is known as supplementary action of proteins and it is the basis of counseling to eat mixed foods.

PROTEINS

PROTEIN METABOLISM

There are three features of protein metabolism

1. Proteins have to be replaced everyday. The overall replacement in adult man is between 1-2 percent of body proteins per day.

PROTEINS

(PROTEIN METABOLISM)

2. Body proteins are constantly being broken down into their constituent amino acids and these are then reused for protein synthesis.
3. The amount and specific pattern of proteins is maintained constant in the body.

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

PROTEINS

ASSESSMENT OF PROTEIN NUTRITION STATUS

The best measure of state of protein nutrition is probably Serum Albumin Concentration. e.g.

> 3.5 G/dl = Normal

3.5 G/dl = Mild malnutrition

≤ 3 G/dl = Severe malnutrition

Thank you

