# Community Medicine

## Lecture One

# Learning objectives

**At the end of this lecture student would be able to :**

1-Define science of nutrition & food .

2-Determine functions of food .

3-Identify relation of nutrition to health & disease .

4-Outline food constituents .

5-Determine energetic value of nutrients .

6-Analyse feeding behavior control .

7-Determine factors affecting nutritional requirements.


# Nutrition

**Nutrition**: Is the science of food and its relationship to health.

It is concerned primarily with the part played by nutrients in body growth, development, and maintenance .

## It deals with :

1-Physiologicaldietary requirements of man .

2-The capacity of different foods to supply those requirements .

3-The pathological changes that may arise from qualitative or quantitative deficiency of food .

# Food

Is any liquid or solid which when swallowed can provide the human body with materials enabling it to function in one or more of the following :

1.Production of energy .

2.Building of the body .

3.Participation in mechanisms regulate body activities .

# Nutrient

Nutrient (food factor) is a term used for specific dietary constituents such as proteins , vitamins and minerals .

Dietetics is the practical application of the principles of nutrition , it includes the planning of meals for the well and the sick .

Good nutrition means maintaining a nutritional status that enables us to grow well and enjoy good health .

# Nutrients

Nutrients are organic and inorganic complexes contained in food.

There are about **50** different nutrients which are normally supplied through the foods we eat .

Each nutrient has specific functions in the body .

Most natural foods contain more than one nutrient

# Nutrients can be classified to :

**1- Macronutrients** : These are proteins, fats and CHO which are often called (**proximate principles** ) because they form the main bulk of food .

**2- Micronutrients** : These are vitamins and minerals

They are called micronutrients because they are required in small amounts which may vary from a fraction of a milligram to several grams

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# Changing concepts

Food has been recognized as important for human beings , in health and disease .

The history of man to a large extent has been a struggle to obtain food .

Protein, carbohydrate and fat had been recognized early in the 19 th century as energy yielding foods and vitamins

**“ rediscovered”** the science of nutrition .

- At the beginning ,public health concerned with sanitation problems of food .
- ۞Then quality and quantity of food , as a protective measure for health , has been involved too.
- ۞Now community aspects of nutrition :

1. Dietary constituents .
2. Nutritional requirements .
3. Assessment of nutritional status .
4. Nutritional problems in public health .
5. Nutritional programs .

# Relation of nutrition to health

- It is evident that nutrition is specifically related to both physical and emotional health.
- ۞Survival depends on air , water and food . These basic life supporting materials , supply the body with certain essential chemicals that enable it to do its work.
- ۞Essential nutrients supply the fuel and building blocks for carrying on body activities

Specific nutritional diseases were identified and try to control them as for example :

Protein energy mal nutrition , endemic goiter , nutritional anemia, nutritional blindness and diarrhoeal diseases .

Significant advances have been made during the past two decades .

## The association of nutrition with :

1- infection

2- immunity

3- fertility

4- maternal and child health and family health have been engaged scientific attention

5- pathogenesis of non- communicable diseases such as coronary heart disease, diabetes and cancer .

# *Epidemiological assessment of nutritional status*

Assessment of nutritional status of communities includes the followings :

1- Nutritional and dietary surveys

2- Nutritional surveillance

3- Nutritional and growth monitoring

4- Nutritional rehabilitation

5- Nutritional indicators

6- Nutritional interventions- all parts of what is broadly known as **Nutritional epidemiology**

# Signs of good nutrition

**1.Well developed body with average weight for body size and good muscles with no skeletal malformations.**

**2.Smooth , clear , slightly moisture skin , with no discoloration.**

**3.Shiny hair with healthy scalp and no brittle nor de-pigmented hair.**

**4. Eyes are clear and bright with no signs of infection or increased vascularity , no thickened conjunctivae.**

**5.Regarding the general appearance , it permits person to be alert , responsive with good attention.**

**6.Good appetite , with no digestive problems including regular elimination (no diarrhea , no constipation).**

**7.Gums are pink , not swollen , no bleeding , straight teeth and well shaped jaw .**

# *Classification of foods*

There are many ways of classifying foods :

**A- Classification by origin**

1- foods of animal origin

2- foods of vegetable origin

## *B- Classification by chemical composition*

1. **Carbohydrates** which provide the body with energy and may be converted into fat.
2. **Fats** which provide the body with energy and may also form body fat.
3. **Proteins** which provide materials for growth and repair of body tissues. They can also provide energy and sometimes can also converted to fat.

**4.Minerals ,which are substances that provides materials for growth ,repair and regulation of body processes.**

**5.Vitamins and other accessory substances that regulate body processes.**

## *C- Classification by predominant function*

1- body building foods , e.g :milk, meat , poultry , fish, eggs, pulses, groundnuts, etc.

2- energy – giving foods e.g : cereals, sugars,. Roots and tubers, fats and oils .

3- protective foods e.g : vegetables, fruits, milk .

# *D- Classification by nutritive value*

1- cereals and millets
2- pulses( legumes )
3- vegetables
4- nuts and oilseeds
5- fruits
6- animal foods
7- fats and oils
8- sugar and jaggery
9- condiments and spices
10- miscellaneous foods

## calorie

Is the unit of energy needed to raise one gram of water one degree centigrade.

-cal-

## kilocalorie

**Energy needed to raise one kilogram of water one degree centigrade.**

**-Kcal,Cal-**

# Normal chemical composition of man weighing 65 Kg

| | Kg | Percentage % |
|---|---|---|
| Protein | 11 | 17 |
| Fat | 9 | 13.2 |
| Carbohydrates | 1 | 1.5 |
| Water | 40 | 61.6 |
| Minerals | 4 | 6.1 |

# Function of food in human body

1. Tissue building (proteins , minerals , vitamins).
2. Bone building (calcium , phosphorus and vitamin D).
3. Vitality and protection from diseases (vitamins and minerals) .
4. Energy production (fats , carbohydrates) .
5. Antibodies formation (proteins) .

# Feeding behavior control

The control of feeding behavior in brain is by centers situated in the hypothalamus through:-

1.Nervous stimuli in the stomach → contraction of stomach when it is empty.

2.Chemical stimuli through the role of insulin and its relation to blood glucose level . Also free fatty acids raised during hunger.

3.Thermic stimuli, in cold weather , person feel more hungry.

# Nutritional requirements (caloric requirements)

**Is a term that indicates the amount of proteins , fat , carbohydrates , minerals , vitamins and water .**

# Factors affecting nutritional requirements

1. Age .
2. Sex .
3. Physiological status (developmental stage).
4. Physical activity .
5. Climate .
6. Body weight .

# Special groups

**Pregnancy** → 400 Calorie daily rise in requirements.

**Lactation** → 1000 Calorie daily rise in requirements.

**Children (1-3) years old** → 1300-1500 Calorie rise in requirement

# Nutrition & Health

- Proper nutrition is the most important single factor in the maintenance of health and efficiency. It encourages diseases prevention and prolongation of productive life.
- The standard of nutrition is an index for the degree of development in any country.

# Nutrition & diseases

- The causation of majority of human illnesses are:-

1. Hereditary factors .
2. Environmental factors .
3. Dietary habits .

- It is impossible to change heredity and a much difficult to change environment , but it is a relatively easy to change feeding habits .
- Great advances have been made during the past 50 years in knowledge of nutrition and in the practical application of that knowledge . Specific nutritional diseases were identified and technologies developed to control them .

- **While attention was concentrated on nutrition deficiency diseases during the 1st decades of the century , the science of nutrition was extending its influence into other fields (agriculture , animal husbandry , economics & sociology) .**
- **During the recent years the science of nutrition moved out of laboratory & linked itself to epidemiology .**

# Relation of food to diseases

1. Deficiency → Quantity
2. Obesity. → Quality
3. Sensitivity.
4. Chemical poisons (arsenic and lead)
5. Bacteria and parasites.

***Thank you***