

## **Lecture 1**

### **Concepts of Nutrition**

#### **1. Nutrition**

Nutrition is defined as the science of food and its relationship to health. Nutrition is food at work in the body. It includes everything that happens to food. It is the study of nutrients and processes by which they are used by the body. It is concerned with the part played by nutrients in the body-growth, development and maintenance.

#### **2. Dietics**

It is the practical application of the principles of nutrition which includes planning of meals for the healthy as well as the sick. Good nutrition means maintenance of nutritional status that enables us to grow well and enjoy good health.

#### **3. Food**

Food is vital for human existence just as air and water. Food may be defined as anything eaten or drunk, which meets the needs of tissue building, regulation and protection of the body and its energy needs. Food is the raw material from which our bodies are made. Intake of right kinds and amounts of foods can ensure good nutrition and health which may be evident in our appearance, well being and efficiency. Food is basic to life. The food we eat is digested and assimilated in the body and used for its growth and development. Food also provides the necessary energy for doing work.

#### **4. Diet**

Diet refers to whatever people eat, drink each day. It includes the normal diet people consume and the diet people consume in groups (Hotel diet) but will also be modified for the sick as part of their therapy (Diet therapy).

## **5. Nutrients**

Useful chemical substances derived from the food by the body are called nutrients. Human beings require more than 45 different nutrients for their well being. Nutrients include:

1. Carbohydrates
2. Lipids
3. Proteins
4. Water
5. Minerals
6. Vitamins

### **CLASSIFICATION OF NUTRIENTS**

1. Major nutrients (Macronutrients): Carbohydrates, lipids, proteins and water.
2. Minor nutrients (Micronutrients): Vitamins and minerals.

#### **The Major Nutrients**

Are utilized for energy converted to structural components of cells or are stored as fat, depending on their level of supply e.g., Carbohydrates form 65-80%, proteins 7-15% and lipids 10-13% of food. The proper utilization of these nutrients requires, appropriate concentrations of micronutrients.

#### **The Minor Nutrients**

Unlike carbohydrates, lipids and proteins, vitamins and minerals do not supply energy or calories, instead they regulate the the metabolism. There are B complex vitamins each with its special functions.

## **Functions of Food**

1. Provide energy
2. Body building
3. Regulating the activities of the body including
  - a- Beating of the heart
  - b- Maintenance of body temperature
  - c- Muscle contraction
  - d- Clotting of blood
  - e- Control of water balance
  - f- Elimination of the waste products of the body
4. Provide resistance to diseases
5. Social function: Feasts are served on specific stages of life— birth, naming ceremonies, birth days, marriages etc.
6. Psychological functions of food. Breastfeeding provides closeness and security to the child. Food also satisfy some emotional needs like security, attention and friendship and acceptance. Food can be used as a weapon to fight against diseases. An insecure child sometimes refuses food, so that mother will be concerned about the child and bow to its demand.

## **CLASSIFICATION OF FOOD**

1. Based on its origin
  - a. Foods of animal origin
  - b. Foods of vegetable origin

### **Based on Chemical Composition**

- a. Proteins
- b. Fats
- c. Carbohydrates
- d. Minerals
- e. Vitamins

### **Based on its Function**

- a. Body building foods – amino acids, proteins
- b. Energy giving foods – carbohydrates (wheat, rice)
- c. Protective foods – vitamins and minerals (vegetables)

### **Based on Nutrition Value**

#### Five Food Group System

- a. Cereals and millets
- b. Pulses and legumes
- c. Milk, milk products and meat
- d. Fruits and vegetables
- e. Fats and sugars

### **Based on their functions**

foods are grouped into **energy yielding foods**. Carbohydrates, fats and proteins release energy on metabolism in our body., **body building foods** Protein foods like milk, meat, fish, eggs, pulses, grains and nuts are essential to build our tissues and **protective foods** like water, minerals and vitamins.

Water is necessary for various body processes. Vitamins are essential for regulating the body processes such as growth, muscular coordination of various organs and functions of several organs like eyes, ears, nose and skin. Minerals like Ca help in controlling blood clotting, muscular contraction and for efficiency of heart muscles. Iron is essential for blood formation. Iodine is necessary for regulating body functions through the thyroid gland.

Al Safwa university college  
Department of Nursing

**Nutrition**  
2022 – 2023

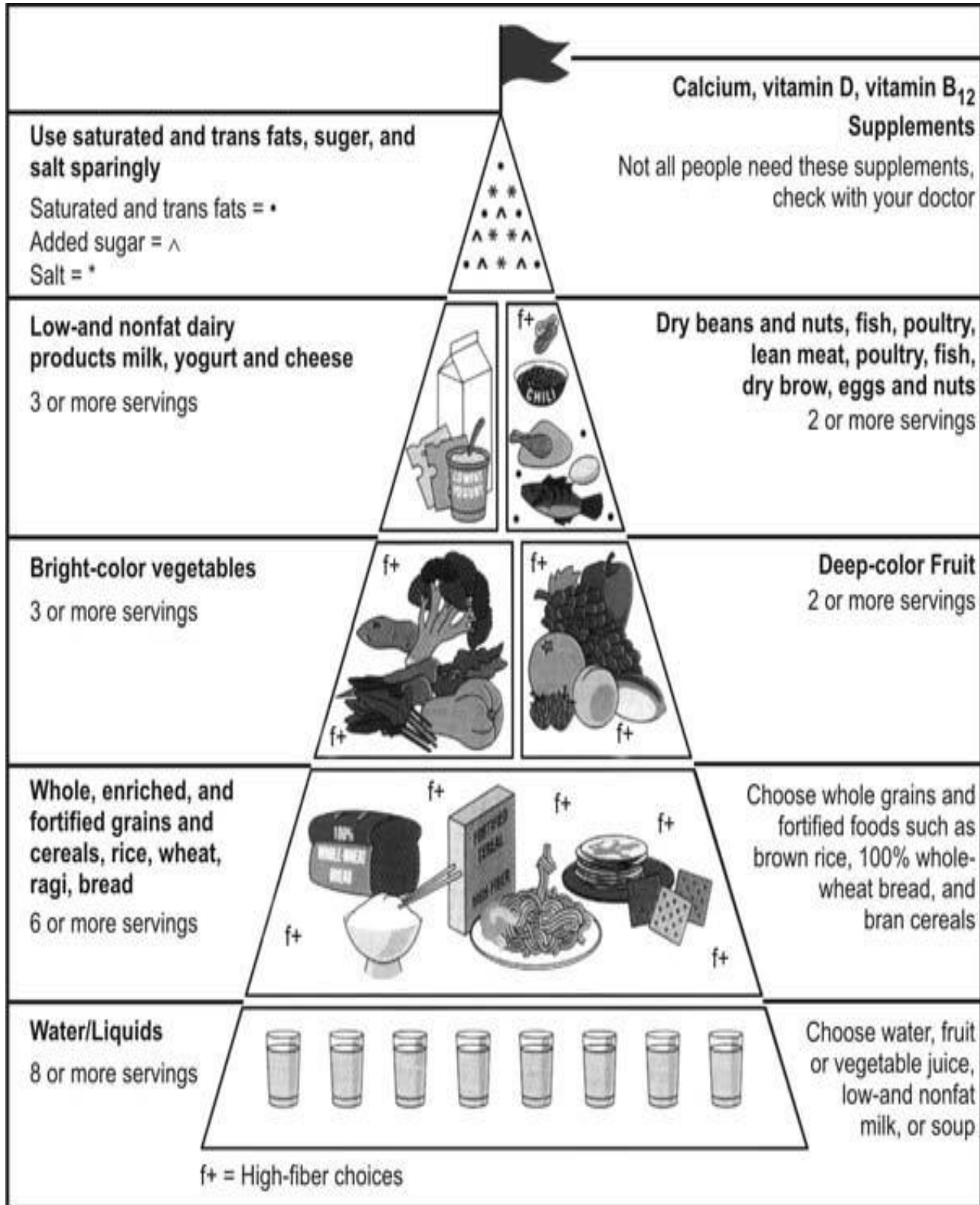
**Lec. Mosa Jaafar Mosa**  
3<sup>rd</sup> stage

## **Lecture 2**

### **Diet Guide and Energy Balance**

One of the most helpful, easy to use diet planning tools is the food guide pyramid which separates foods into specific groups and then specifies the number of servings from each group to each day.

- The placement of this five food groups on the pyramid emphasizes their role in the diet.
- The grains that form the base should serve as the foundation of a healthy diet because breads, cereals, rice and wheat are high in carbohydrates and low in fat.
- The grains are followed by fruits and vegetables which supply the vitamins, minerals and fiber.
- The next level suggests eating smaller amounts of dairy products as well as meat, poultry, fish, beans, eggs and nuts. While foods from these group provides proteins, calcium, iron, zinc and other nutrients, they often contain large amount of fat and should be chosen carefully.
- The tip of the pyramid consists of fats, oils and sweets. They supply lot of fat and/or calories and few nutrients. These items should be added to diet carefully.



## Calorie

The qualitative food requirements are estimated in term of energy is calories. Physiologic calorie or kilocalorie is the unit of energy, which is the amount of heat necessary to raise the temperature of one kilogram of water by 1°C, from 14.5°C to 15.5°C.

### Calorie Value of Food

	(kilocalories/gm)
Carbohydrates	4
Fat	9
Proteins	4

## Respiratory Quotient (Rq)

The Respiratory Quotient (RQ) is the ratio of the volume of CO<sub>2</sub> eliminated to the volume of O<sub>2</sub> utilized.

$$RQ = \frac{\text{Volume of CO}_2 \text{ eliminated}}{\text{Volume of O}_2 \text{ utilized}}$$

The RQ is 1 because in carbohydrates diet, the volume of CO<sub>2</sub> produced is the same on the volume of O<sub>2</sub> consumed.



$$\frac{CO_2 \text{ produced}}{O_2 \text{ consumed}} = \frac{6}{6} = 1$$

Fats The RQ for fat is 0.7

Protein RQ for protein is about 0.8



## The Basal Metabolic Rate (BMR)

BMR is defined as the energy expenditure of a subject at complete physical and mental rest. The BMR is the energy expenditure necessary to maintain basic physiologic conditions such as:

- a. The activity of the heart
- b. Respiration
- c. Conduction of nerve impulses
- d. Ion transport across membranes
- e. Reabsorption in the kidney, and
- f. Metabolic activity such as synthesis of macromolecules under standard conditions.

## Body Mass Index BMI

The basal mass index is used as a reference standard for assessing the prevalence of obesity in the community. Ideal body mass index = 19–25

$$\text{BMI} = \frac{\text{Weight in kg}}{\text{Height in meters}^2}$$

