

# NUTRITION AND FOOD

## CONSTITUENTS

# DEFINITION

- It is a science of food, its action, its interaction, digestion, metabolisms and its processing.
- Nutrition is the science deals with quantity and quantity of food.
- French man “ Lavosier” is known as the ‘father of nutrition’.

# NUTRIENTS

- Chemical constituents / food constituents / chemical components.
- Required by the body for proper growth and maintenance.
- When given in accurate amount made the diet a balanced one.

# NUTRIENTS

Basic five nutrients are

- Carbohydrates
- Fats
- Proteins
- Vitamins
- Minerals

# CLASSIFICATION

According to functions for the body, four category of nutrients are:-

- **Energy giving nutrients:** Carbohydrates, fats and proteins.
- **Body building nutrients:** Proteins, vitamins, carbohydrate and water.

# CLASSIFICATION.

- **Protective nutrients:** Proteins, vitamins, minerals and water.
- **Regulatory nutrients:** Water and roughage.

# CARBOHYDRATES

- Sugars or polymers of sugars.
- Provide us energy in form of calories.
- 1 gm carbohydrate provide approx. 4 calories of energy.

# CARBOHYDRATES

- Contribute major portion of Indian diet.
- There are about 60% of food products in one day diet that consist majorly carbohydrates.



# FUNCTIONS OF CARBOHYDRATES

- Provide energy to the body.
- Helps to maintain the metabolic rate.
- Required for normal body building and growth.
- Helps to protect against malnutrition.
- Spare protein when stored in the body.

# TYPES

- SIMPLE

## Carbohydrates

Simple carbohydrates are found in foods such as fruits, milk, and vegetables

Cake, candy, and other refined sugar products are simple sugars which also provide energy but lack vitamins, minerals, and fiber



- COMPLEX

## Complex carbohydrates

Complex carbohydrates provide vitamins, minerals, and fiber

Foods such as breads, legumes, rice, pasta, and starchy vegetables contain complex carbohydrates



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# PROTEINS

- Chemical constituent.
- Body building material.
- Basic unit is amino acid.
- Provides energy to the body.
- 1 gm of protein provides approx. 4 calories of energy.

# FUNCTIONS OF PROTEINS

- Works as body building material.
- Helps in repairing of blood cells and body tissues.
- Maintains genetic material of the body
- Plays significant role in creating immunity.
- Almost all enzymes are protein in nature, which play their effective roles.

# SOURCES

Proteins



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# FATS / LIPIDS

- Quality source of energy.
- 1 gm of fats provide approx. 9 calories of energy.





# TYPES



# FUNCTIONS OF FATS

- Provide bulk to the diet.
- Fulfill satiety value.
- Used as reserve source of energy.
- 1 gm of fat provide approx. 9 calories of energy.
- Maintains metabolic rate



# VITAMINS

- Vitals for life.
- Present in different forms in body.
- Required in very small quantities.

## **TWO BASIC TYPES:**

- Fat soluble vitamins
- Water soluble vitamins

# FAT SOLUBLE VITAMINS

## Vitamin A – Retinol

- Maintains normal vision
- Provides protection against infections
- Food Sources:- Fish liver oil, sea food, milk, butter, green leafy vegetables & dry fruits.

# FAT SOLUBLE VITAMINS

## Vitamin D – Calciferol

- Helps in absorption of calcium and phosphorous
- Food Sources:- Egg yolk, liver, fish and milk.

# WATER SOLUBLE VITAMINS

## **Vitamin B-complexes:**

- Helps produce energy from carbs
- Helps body make non-essential amino acids
- Helps turn tryptophan into niacin and serotonin
- Help produce body chemicals (insulin, hemoglobin, etc)
- Food sources:- Meat , cereals, vegetables and fruits.

# MINERALS

- Regulate body processes
- Give structure to things in the body
- No calories (energy)
- Cannot be destroyed by heat

# CATEGORIES OF MINERALS

## Major minerals

- Calcium
- Phosphorus
- Magnesium
- Electrolytes (sodium, chloride, potassium)

## Trace minerals

- Chromium
- Copper
- Flouride
- Iodine
- Iron
- Manganese
- Selenium
- Zinc

# CALCIUM

- Bone building
- Muscle contraction
- Heart rate
- Nerve function
- Helps blood clot

# PHOSPHORUS

- Generates energy
- Regulate energy metabolism
- Component of bones, teeth
- Part of DNA, RNA (cell growth, repair)
- Almost all foods, especially protein-rich foods, contain phosphorus



# MAGNESIUM

- Part of 300 enzymes (regulates body functions)
- Maintains cells in nerves, muscles
- Component of bones
- Best sources are legumes, nuts, and whole grains

# ELECTROLYTES

## **Chloride:**

- Fluid balance
- Digestion of food, transmits nerve impulses

## **Potassium**

- Maintains blood pressure
- Nerve impulses and muscle contraction

## **Sodium**

- Fluid balance
- Muscles relax, transmit nerve impulses
- Regulates blood pressure

# ELECTROLYTES

## Sources:

- Salt (sodium chloride)
- Fruits, veggies, milk, beans, fish, chicken, nuts (potassium)

# IRON

- Part of hemoglobin, carries oxygen
- Brain development
- Healthy immune system
- Sources:
  - Animals (heme) vs. plants (non-heme)
  - Better absorbed from heme
  - Consume vitamin C with non-heme
  - Fortified cereals, beans, eggs, etc.

# ANTI OXIDANTS

- Slow or prevent damage to body cells
- May improve immune function and lower risk for infection and cancer
- Carotenoids – beta carotene (familiar)
- Vitamin C
- Vitamin E
- Found in colorful fruits/veggies and grains

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