Q What is Balanced Diet? And give overview of Biomolecules.

Answer

"Let thy food be thy medicine"
- Hippocrates

Balance Diet:

The amount of food that is appropriate and good for a human health body, neither too deficient nor too sufficient.

→ It depends upon the age and livingstyle of a humans.

→ For Instance, a man with sedantry lifestyle need less calories as compare to an adult with labrious lifestyle.

Important Components:

In order to have a balance diet, following diet should be taken in an appropriate and balance manner;

→ Carbohydrates
→ Protein
→ Lipids
→ Vitamins

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Biomolecules:

Naturally occuring organic molecules in human body is known as biomolecules. It consist of macromolecules which are:

- Carbohydrates
- Protein
- Lipids & vitamins

→ These organic molecules along with carbon and hydrogen, sometimes consist sulphur, phosphorus and hydrogen as well.

Carbohydrates:

- An Organic Compound composed of Carbon, hydrogen and Oxygen.
- Hydrogen and oxygen found in the ratio of 1:2.
- Human body need 3.9 cal of energy per kg.

Term Origin

Term Carbohydrates originated from Greek word, Saccharides means "Sugar".

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Forms of Carbohydrates :

On the basis of saccharides, carbohydrates classified into:

> Monosaccharide
> Oligosaccharide
> Polysaccharide

Monosaccharide :

- **Term:**

From Greek word: mono = one
sakkron = Sugar

→ Monosaccharide are Single Sugar containing component.

Features

→ It cannot be further hydrolyzed because they are single sugars.

→ In this way, they are also known as, Single sugars.

→ The formula is $C_n(H_2O)_n$

For. Example:

Glucose = The immediate Source of energy

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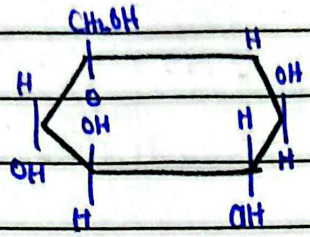
Galactose = A sugar in milk & Yogurt.

Fructose = A sugar in honey



Glucose
A fundamental unit of Carbohydrates

Oligosaccharides

Term: Oligo = few
Saccharides = Sugar

→ Those compound molecules which yields two to ~~more~~ 10 Sugars on hydrolysis is known as Oligosaccharides.

→ Compounds which yield two sugar molecules are known as Disaccharides

→ Those compounds which yield three Sugar molecules are Trisaccharides

- **Formula:**

$C_n(H_2O)_{n-1}$ ⇒ Disaccharides

$C_n(H_2O)_{n-2}$ ⇒ Trisaccharides

Examples:

Sucrose → Glucose + Fructose

Maltose → Glucose + Glucose

Polysaccharides

Those compounds which yields more sugar containing molecules (saccharides).

→ Monosaccharides which are produced on hydrolysis, of same type are known as homosaccharides.

→ Those which yields different types, known as heterosaccharides.

→ **Formula:**

$(C_6H_{10}O_5)_n$

Functions:

1. Carbohydrates are instant source of energy for human body, in form of glucose
2. It helps in maintaining normal blood sugar

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-> It help in regulation of nerve tissue and energy source for brain

-> It is the main component of protective membranes, such as cell wall in plants & cell membrane in animals.

-> It is one of main component in dietry fibres which help in constipation.

Proteins

Proteins are the chief-builders of the body. There are complex molecules, found in various structural and functional forms. They are required to body according to 1kg of body weigh.

-> It provides 4.1 calories per gram

Composition:

- Proteins are composed of small monomers, known as aminoacids.
- Aminoacids = Nitrogen containing Organic compounds, building block of proteins

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Two Forms of Amino Acid

Essential Amino Acid	Non-essential Amino Acid
• These are not present in human body. • They more must be taken from food • They are total 9 in number E.g: leucine, isoleucine, valine, lysine etc.	• These are formed naturally within the body • They are 11 in numbers • Some of them are asparagine, glutamic acid glycine, glutamine etc • Arginine, cannot be produced by ~~adu~~ infants.

Classification of Protein:

1 According to the Structure:

a) **Primary:** A long-chain of amino acids in a proper sequence. These are non-functional proteins.

b) **Secondary:** Polypeptide chain in a double helix form, having three-dimensional structure.
- They form Hydrogen bonding
- Keratin, Silk fibres etc

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Tertiary: Polypeptide chains in a more coiled form, forming disulphide bond.
Eg: Globulins of blood

Quaternary: When two or more polypeptide form a molecules of protein.
Eg hemoglobin etc.

2 **According to functions**

Enzymatic = Highly specialised protein for catalytic activity.
Eg Urease, lipase

Carrier = It help transport ions and molecules to body.
Eg myoglobin, Haemoglobin

Structural = These protein aid in Strengthening biological structures
Keratin, elantin, collagen.

Functions

→ These are the most important component of body, because in the form of enzymes it

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helps in carrying out the reactions in human body.

2 It strengthen the structures of human body such as nails, hairs etc.

3 It helps in transporting ions or molecules and oxygen to muscles and cells.
Myoglobin carries O_2 to muscle cells
Haemoglobin carries blood to cells.

4 Maintain and replace damaged tissues and build new tissues.

Lipids

→ Lipids, are also known as oils and fats. They are also naturally occurring organic compounds in animals and plants both.

→ It provide 9.1 calories per gram.

Basic Unit:

Lipids are made up of ~~phospho~~ triglyceral, which is composed glyceral and fatty acid.

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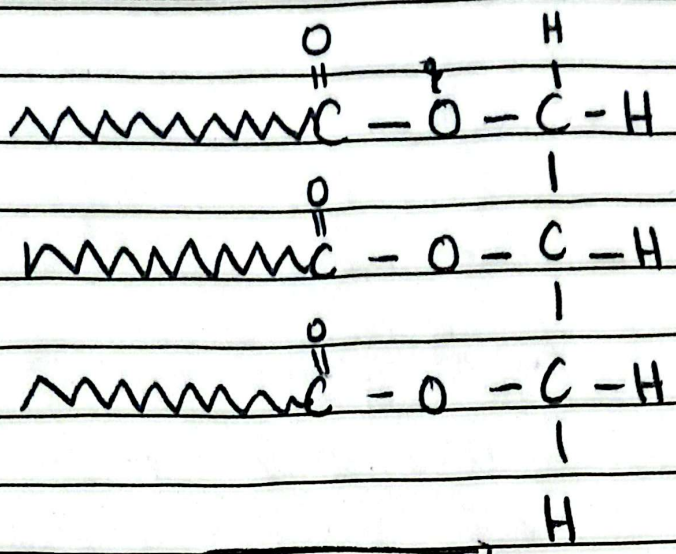

Triglyceral

→ Some of the lipids are made up of 3 fatty acids, glycerol and ~~phospholipid~~ alcohol, known as phospholipids.

Form of Lipids:

1 Unsaturated lipids:

→ Those lipids are solid at room temperature and have high melting point.

→ These lipids are single bonded carbon molecules. Due to absence of double bonds there is not any bent in it which keep all molecules tightly packed.

Example:

Butter ghee, Coconut Oil, Palm oil

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2 **Trans-fat:**

- They are semi-solid fats.
- These are unsaturated fats with at least one double bond. It makes bent due to which it is loosely held and become semi-solid instead of solid fats.
- Found in Cookies, Snacks, Salad dressings.

3 **Unsaturated fats:**

- Unsaturated fat are double bonded fats.
- It is mostly founded in plants.
- It consist of two forms:
  Monounsaturated fats
  Polyunsaturated fats

Monosaturated Fats: These fats help in lower bad LDL Cholestrol. These are found in avacado, olive, peanut oils

Polyunsaturated Fats: These are found in Sunflowers, vegetable oils etc.

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Functions

(1) Lipids helps in regulating body temperature

(2) Lipids are Storage Compounds, triglycerides serve as reserve energy of the body.

(3) It insulate nerve cells and helps in brain functioning.

(4) They protect vital organs like kidney and heart etc.