

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 Sedentary 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

Biomolecules:

Naturally occurring organic molecules in human body is known as biomolecules. It may 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, Sacccharides means "Sugar".

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 $C_n(H_2O)_n$

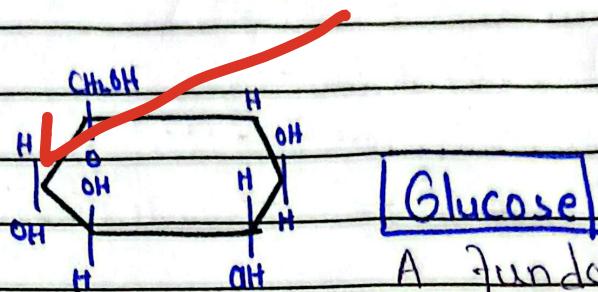
For Example :

Glucose = The immediate Source of energy

no need to discuss these in this much detail.

Galactose = A Sugar in milk & Yogurt.

Fructose = A sugar in honey



A fundamental unit of carbohydrates

Oligosaccharides

Term: Oligo = few
Saccharides = Sugar

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

→ Compounds which yield two sugar molecules are known as Disaccharides

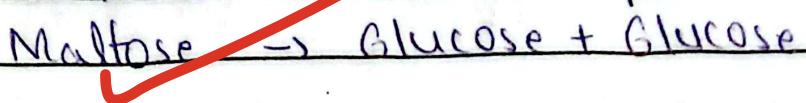
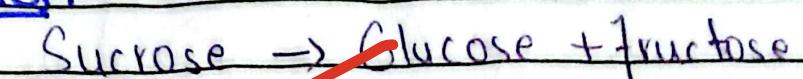
→ Those compounds which three sugar molecules are ^{yield} Trisaccharides

Formula:

$C_n(H_2O)_{n-1} \Rightarrow$ Disaccharides

$C_n(H_2O)_{n-1} \Rightarrow$ Trisaccharides

Examples:

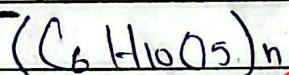


Polysaccharides

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:



Functions:

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

- It helps 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 dietary 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 by body according to 1kg of body weight.

- It provides 4.1 calories per gram

Composition:

- Proteins are composed of small monomers, known as amino acids.
- Amino acids = Nitrogen containing Organic Compounds, building block of proteins

Two Forms Of Amino Acid

Essential Amino Acid

- These are not present in human body.
- They have to be taken from food.
- They are total 9 in number.

E.g.: leucine, isoleucine, valine, lysine etc.

Non-essential Amino Acid

- 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 ~~adults~~ 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.

Tertiary: Polypeptide chains in a more coiled form, forming disulphide bond.

E.g.; Globulins of blood

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

E.g. hemoglobin etc.

2 According to functions

Enzymatic = Highly specialised protein for catalytic activity.

E.g. Urease, Lipase

Carrier = It help transport ions and molecules to body.

E.g. myoglobin, Haemoglobin

Structural = These protein aid in strengthening biological structures
Keratin, elastin, collagen.

Functions

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

helps in carrying out the reactions in human body.

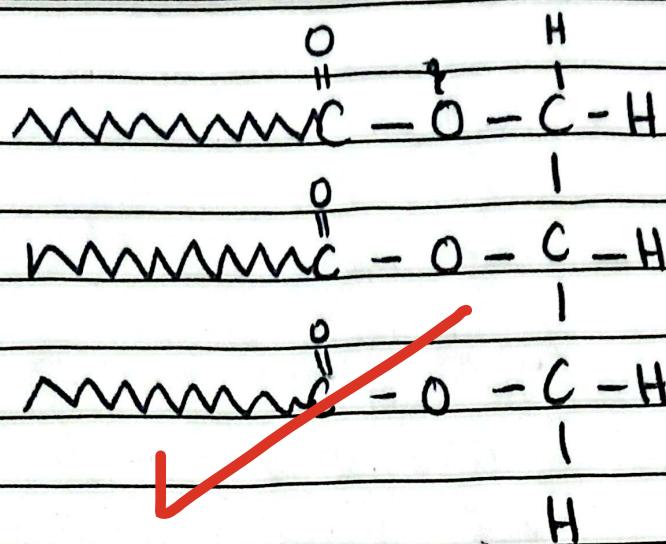
- 2 It strengthens the structures of human body such as nails, hairs etc.
- 3 It helps in transporting ions or molecules and oxygen to muscles and cells.
Myoglobin carries O₂ to muscle cells.
Haemoglobin carries blood to cells.
- 4 Maintain and replace damaged tissues and build new tissues.

Lipids

- Lipids, are also known as oils and fats. They are also naturally occurring organic compounds in animals and plants both.
- It provides 9.1 calories per gram.

Basic Unit:

Lipids are made up of ~~phosph~~ triglycerol, which is composed glycerol and fatty acid.



Triglycerol

→ 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

2 Trans-fats:

- They are semi-solid fats.
- These are ~~unsaturated~~ fats with ~~at~~ at least one double bond. It makes them ~~hard~~ 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 found in plants.
- It consists of two forms:
Monounsaturated fats
Polyunsaturated fats

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

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

Date: _____

Day: _____

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.

you have many irrelevant parts.

bcz of which the answer has become very lengthy and will badly affect your time management.

