

Name of the student: *Date:* 21/10/2020

Carbohydrates:

Carbohydrates are biomolecules comprising carbon, hydrogen and oxygen atoms.

- Carbohydrates are energy producing foods.
- Carbohydrates are easily digested.
- One gram carbohydrates can produce 4 kilocalorie of heat.
- An adult person needs 4.6 gm of carbohydrates per kilogram of his body weight.
- They are sugars, starch and fibres found in fruits and vegetables.
- The brain is the only carbohydrate-dependent organ in the body.
- Fiber is actually a carbohydrate—technically.
- Through digestion disaccharide and polysaccharide turn into simple carbohydrate (monosaccharide) and get absorbed into the body.

Q. An adult person get 1600 kilocalorie energy from his daily taken carbohydrates. How much carbohydrate does he take daily and what is his body weight?

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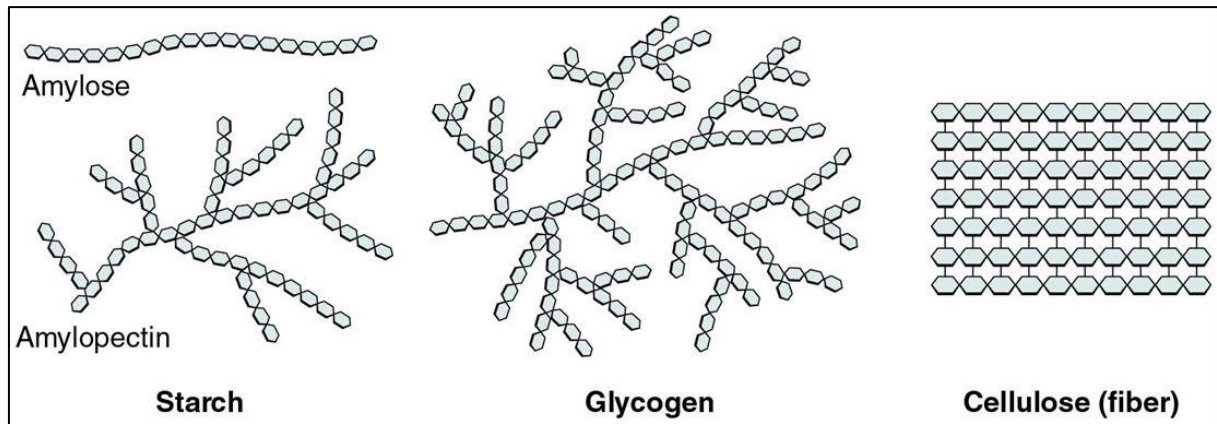
Classification of carbohydrates:

Carbohydrates are classified into the following:

- a) Simple carbohydrates
 1. Monosaccharides (1 monomer)
 2. Disaccharides (2 monomers)
 3. Oligosaccharides (2-9 monomers)

b) Complex carbohydrates (Polysaccharides)

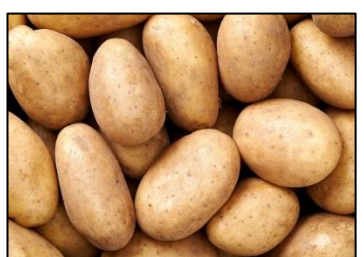
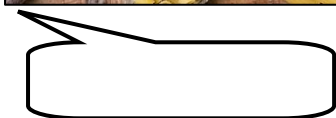
- 1) Starch
- 2) Glycogen
- 3) Cellulose



Sources of Carbohydrates

1. **Simple sugars** are found in the form of fructose in many fruits.
2. **Galactose** is present in all dairy products.
3. **Lactose** is abundantly found in milk and other dairy products.
4. **Maltose** is present in cereal, beer, potatoes, processed cheese, pasta, etc.
5. **Sucrose** is naturally obtained from sugar and honey containing small amounts of vitamins and minerals.

Q. Write down the types of carbohydrates in the foods below.



Following are the important examples of carbohydrates:

- Glucose
- Galactose
- Maltose
- Fructose
- Sucrose
- Lactose
- Starch
- Cellulose
- Chitin

Functions of Carbohydrates

- The main function of carbohydrates is to provide energy and food to the body and to the nervous system.
- Carbohydrates are known as one of the basic components of food, including sugars, starch, and fibre which are abundantly found in grains, fruits, and milk products.
- Carbohydrates are also known as starch, simple sugars, complex carbohydrates and so on.
- It is also involved in fat metabolism and prevents ketosis (a metabolic process in which the body burns stored fat for energy, instead of glucose).
- Inhibits the breakdown of proteins for energy as they are the primary source of energy.
- An enzyme by name amylase assists in the breakdown of starch into glucose, finally to produce energy for metabolism.

Q. Why does carbohydrate dominate among different elements of our daily food?

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Carbohydrates deficiency related diseases:

The intake of carbohydrate, be it more or less, both have negative impact on our body.

- 1) Due to deficiency of carbohydrate malnutrition occurs.
- 2) If there is fall of carbohydrate in blood, symptoms of hypoglycemia appear. Such as—
 - Feeling of appetite
 - Nausea
 - Excessive sweating
 - Irregular heart beat
 - Dizziness

Proteins:

Proteins are very large molecules composed of basic units called amino acids. In addition to containing carbon, hydrogen, and oxygen amino acids contain nitrogen.

- Protein is a complex compound of amino acids.
- Proteins are produced after arranging 22 amino acids in different ways, number and types.
- Protein having digested turns into amino acids.
- Protein is the only nutrient of food that can supply nitrogen to the body.
- The nutrition value of proteins depends on its digestibility.
- After having an intake of proteins the proportionate percentage of protein which is absorbed from the intestine is called the easily digestible quotient of the proteins.
- The proteins which are cent percent absorbed in the body and enhances the growth and repair has the easily digestible quotient of 1, e.g.—breast milk, egg.

Q. Why do the taste, smell and colour of food like fish, milk and meat etc. vary from each other?

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Q. What do you mean by the easily digestible quotient of egg 1?

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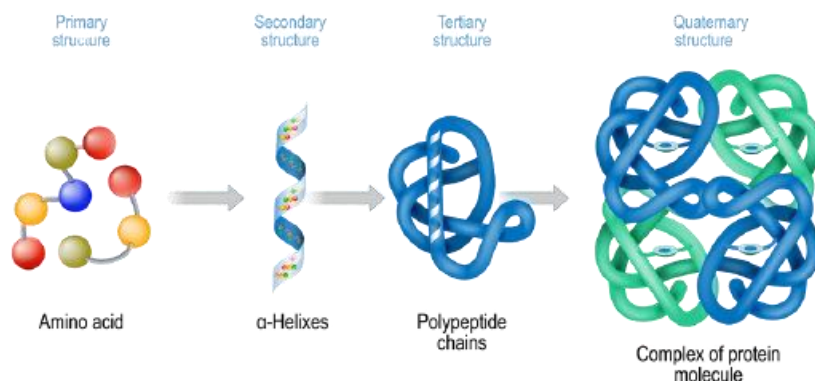
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Classification of Proteins:

Protein molecules are large, complex molecules formed by one or more twisted and folded strands of amino acids. Each amino acid is connected to the next amino acid by covalent bonds.

1. **Primary (first level)** – Protein structure is a sequence of amino acids in a chain.
2. **Secondary (secondary level)** – Protein structure is formed by folding and twisting of the amino acid chain.
3. **Tertiary (third level)** – Protein structure is formed when the twists and folds of the secondary structure fold again to form a larger three dimensional structure.
4. **Quaternary (fourth level)** – Protein structure is a protein consisting of more than one folded amino acid chain.



Functions of Protein:

Proteins play multiple functions in the body and its structure gives it its functionality. Some prominent functions are—

- 1) Our body needs protein for growth and maintenance of tissues.
- 2) Enzymes are proteins that aid the thousands of biochemical reactions that take place within and outside of our cells.

- 3) Myosin is a protein found in muscles which enables the contraction of muscles making movement possible.
- 4) Some proteins are hormones, which are chemical messengers that aid communication between our cells, tissues and organs.
- 5) Some proteins include keratin, collagen and elastin, which help form the connective framework of certain structures in our body
- 6) Protein plays a vital role in regulating the concentrations of acids and bases in our blood and other bodily fluids.
- 7) Proteins regulate body processes to maintain fluid balance.
- 8) Proteins help form immunoglobulins, or antibodies, to fight infection.

Proteins deficiency related diseases:

- Due to deficiency of proteins children suffer from malnutrition.
- Due to the deficiency of protein the growth and development of the body is hampered.
- The children suffer from **kwashiorkor** and **marasmus** disease due to protein deficiency.

Q. Why is protein considered as a very important food nutrient in nutrition science?

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