

Q How Carbohydrates, Proteins and Fats are digested in human? (css - 2023) (5-marks)

Introduction

Carbohydrates, Fats and Proteins are digested by different organ of digestive system. In biological system different organ are cooperate with one another to perform a single function.

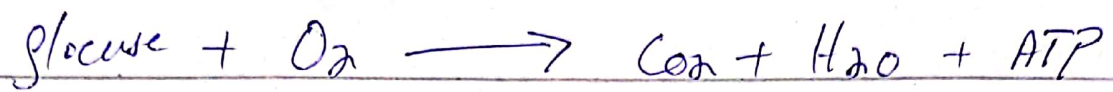
Digestive system

Digestive system is a system through which complex molecule of food are broken down into smaller or simpler molecules that are capable of cellular absorption.

Why need absorption in cell

When these smaller molecule i.e. glucose absorb in blood and blood is circulating in body. Hence glucose reach to each cell of body. On the other hand oxygen come from breath and absorb in blood. Blood also reach it to cell. where oxygen break down the glucose and convert into $\text{CO}_2 + \text{H}_2\text{O} +$

+ ATP



Components of digestive system

There are different 5 components/organs of digestive system which digest Carbohydrates, Fats and Protein in different stages

1 Oral Cavity (Carbohydrates digestion stage)

- + It is the digestion stage of Carbohydrates.
- + Carbohydrates are digested in mouth through Grinding and chewing
- + Its chemical digestion start here with the help of Salivary gland.
- + Salivary gland produces Saliva (which has Amylase enzyme) which are used to digest Carbohydrates
- + Then this Food in the form of Bolus go towards stomach through Esophagus. This journey is called, Peristalsis

2 Stomach : (Protein digestion stage)

+ It also made up of Protein.

+ It has three function.

+ a) Mucus lining protect the wall of stomach.
From digestive enzymes

b) Stomach has HCl which kill germs which exist in food. Furthermore HCl maintain Ph for activation of enzymes.

c) There are Pepsin enzymes present which digest protein in stomach.

3 Small intestine (Fat digestion stage)

It has three function

a) It first digest fat with the help of liver. Because produce Bile (green color liquid) which is already stored in Gall bladder

+ Gall bladder inject Bile drop by drop in small intestine as per the amount of fat in food and it start digestion of fat.

b) Digestion completion is the second function of small intestine. All the digestion of Carbohydrates, Fats

and protein which started in above organs are completed here

+ For digestion completion, there is need of Pancreas enzymes which produce pancreatic juice

+ This pancreatic juice consist of

Carbohydrase : For digestion of carbohydrates.

Protease : For digestion of ~~Fats~~ Proteins.

Lipase : For digestion of fats

It also digest all type of enzymes.

c) Absorption into blood stream is the third function of small intestine. When all are digest then all convert into small particle like glucose and absorb into blood.

4 large intestine

99% food become waste when reach in large intestine. However it stay here to ensure all important nutrient are absorb or for ~~the~~ reabsorption of nutrient as well as water here.

5] Rectum

waste store here before it is excreted out of

the body.

Conclusion:-

The above structure shows that the different organs of digestive system digest different substances. For example Carbohydrate digest in oral cavity. Furthermore Proteins are digested in Stomach. Moreover, Fats are digested in Small intestine. Even all these digestion process are also complete in small intestine.

Q. What are antioxidants and why are they used in Foods? Write a short note on natural and Synthetic anti-oxidants. (2023).

Ans Oxidant :

A process in which a substance gain oxygen and loses hydrogen or electron is called oxidant or oxidation.

Antioxidants:

It prevent the process of oxidation in substance or food. These are those substances which are used to prevent oxidation of fat by molecular oxygen.

Role of antioxidant

- + It is used in Oily and Fatty foods.
- + It enhance the life of food.
- + It prevent rancidity of fried and oily food
- + It prevent or reduce the oxidation of fried and oily foods.

Antioxidant include of:

Antioxidant includes vitamin E, C, A, Zinc iron

beta carotene, and Selenium.

Synthetic antioxidant:

These are substances created from chemical process. These anti-oxidants are butylated hydroxy anisole (BHA), butylated hydroxytoluene (BHT), tertiary butylated hydroquinone (TBQH).

Usage of synthetic antioxidant

These are used to store Potato chip, breakfast cereal, salted nuts, fat-containing dehydrated foods ~~at~~ for long time and enhance its life.

Natural antioxidant:

These are obtained from natural sources and have been used in food, cosmetics, pharmaceutical industries. These are vitamin rich food as well as antioxidant eg. Blue berries, bean, nuts dark green vegetables tea etc.