Process of Digestion

What is the digestion Process?

We all associate the digestive system with the stomach, But what if I say, the digestive system starts from the mouth itself. There are various other organs involved in the digestive system that take place in the human body. Let's educate ourselves about this process.

The digestive process is a series of reactions to food by digestive hormones and juices. The mouth cavity is where it all begins.

Why is digestion important?

It is an essential process that breaks down *proteins, fats, carbohydrates, vitamins, and minerals into simple forms for easy entry into the body's cells*. During this process, proteins are converted to amino acids, carbohydrates are converted to light sugars and fats are broken down into fatty acids and glycerol.

Many digestive enzymes and hormones act on food, in various stages during the digestion process. The whole process takes place in a sequence.

Digestion Process

The digestion process can be divided into various stages, such as:

Ingestion, Propulsion, Mechanical breakdown, Chemical digestion, Absorption, and Elimination

1. **The mouth cavity**
2. **Stomach**
3. **Small intestines**
4. **Large intestines**

Digesting involves a complex combination of mechanical and chemical processes. Some of the functions in this process include the importation and promotion of food, mechanical or physical digestion, chemical digestion, absorption, and disposal.

Digestion in the Mouth

When food is ingested, chewing and mixing of food take place. The action of saliva from the salivary glands also causes a chemical breakdown of carbohydrates. *30% of starch is hydrolysed by*

the action of amylase, an enzyme that is still active. Another enzyme, lysozyme, is an antibacterial agent that prevents infections.

Starch + Salivary amylase → Maltose

Digestion and swallowing are important activities that take place here in the oral cavity. Food is broken down into smaller particles by the action of chewing on the teeth. As saliva is absorbed, it mixes with food particles, moisturizes it, and softens food. This little ball is called a bolus, and it is swallowed. The pharynx assists the flow of the oesophagus to the throat, as it travels to the abdomen through the peristaltic flow of the oesophagus.

Digestion in the stomach

When food reaches the stomach, it lasts about four to five hours. There are various glands in the lining of the lining of the stomach mucosa. Neck mucous cells secrete mucus. Peptic cells release the proenzyme pepsinogen. Parietal or Oxyntic cells release HCl (Hydrochloric acid) as well as an important internal factor in the absorption of vitamin B12.

Stomach food blends well with stomach fluids with abdominal muscle movements. This lightly digested, acidic and pulpy food is called chyme. Protein is mainly digested in the stomach. The mucus and bicarbonate of gastric juice help protect the mucosal epithelium from highly acidic HCl. Mucus also helps to soften food.

The chemical variations that occur in the stomach are summarized as follows.

- **Stomach juices and enzymes**
- **HCl provides an acidic pH.**
- **Pepsinogen (proenzyme) is converted to Pepsin by HCl**
- **Peppin, on the other hand, converts proteins into peptones and proteases.**
- **Protein (proenzyme) is converted to Renin by HCl.**
- **Casein (milk protein) is converted to peptides by Renin.**

After the action of stomach juices and enzymes, food then enters the small intestine.

Digestion in the small intestine

In the small intestine, further digestion occurs. Due to the various movements of this organ, the chyme is re-mixed and excreted. There are many enzymes that are inserted into the small intestine from organs such as pancreas, liver; without intestinal fluids. All of these affect food particles and break them down into smaller particles that can enter the bloodstream.

The chemical variations that occur are summarized below:

Pancreatic Drinks:

- **Amylase converts starch into Maltose.**
- **Enter kinase converts Trypsinogen to Trypsin**
- **Trypsin converts proteins into Dipeptides**
- **Trypsin converts Chymotrypsinogen and Chymotrypsin.**
- **Chymotrypsin converts peptones into Dipeptides.**
- **Trypsin converts Procarboxypeptidase into Carboxypeptidase.**
- **Carboxypeptidase converts proteases into Dipeptides.**
- **Trypsin converts PR elastase into Elastase.**
- **Elastase converts elastin into Dipeptides.**
- **Pancreatic amylase converts polysaccharides (Starch) into Disaccharides.**
- **Nuclear cells are in the pancreatic core, forming nucleic acids and forming nucleotides and nucleosides.**

Intestinal drinks:

- **Maltase converts maltose into glucose.**
- **Sucrose converts sucrose into glucose & fructose.**
- **Lactase converts lactose into glucose & galactose.**
- **Aminopeptidases convert peptides into amino acids.**
- **Dipeptides convert dipeptides into amino acids**

Bile converts fat globules into oil droplets through a process called emulsification. Fats are divided into diglycerides and aminoglycosides.

Triglycerides are converted to fatty acids and glycerol by pancreatic lipase.

Bio macromolecules are broken down in the duodenum region. All simple types of processed foods fall into the regions of jejunum and ileum. Any raw, non-digested food particles are passed on to the large intestine.

Digestion in the large intestine

In the large intestine, the digestive function is very small. Here, bacterial action takes place in the food particles left over. Minerals, water, and certain drugs are absorbed into the large intestine. The mucous membranes of the large intestine help to hold the waste particles, without rubbing them.

Any undigested and unprocessed waste particles called liquid substances are transferred to the rectum, where they are removed by anus.

Control of digestive processes

Digestive processes are regulated by hormones and nerves. There is a continuous symptomatic collision between the brain and the digestive tract. Hormones regulate the digestive process by signal at the right times to make digestive juice. They also send signals to the brain that indicate they are hungry or full. The nervous system, through the brain and spinal cord, regulates digestive processes.

FREQUENTLY ASKED QUESTIONS (FAQS)

Q1. What is the step-by-step process of digestion?

Ans. Ingestion, mechanical and chemical breakdown of food, nutrient absorption, and evacuation of indigestible food are the four processes in the digestion process.

Q2. Four stages of digestion?

Ans. Ingestion, propulsion, mechanical digestion, chemical digestion, absorption, and faeces are the digestive processes.

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