

DIGESTIVE SYSTEM

The digestive system breaks down food containing proteins, carbohydrates and fats into small molecules that pass into the bloodstream and used by the body to produce energy, growth and repair of tissues.

The Digestive Process includes:

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|---------------|-------------------------------------|
| Ingestion: | Swallowing |
| Digestion: | Mechanical and Chemical breakdowns |
| Absorption: | Nutrients into the blood Stream |
| Assimilation: | Use of nutrients in cells & tissues |
| Excretion: | Removal of waste matter |

The digestive system is divided into 2 main parts:

1. Alimentary Canal or Gastro-intestinal Tract

Includes the mouth, pharynx, oesophagus, stomach, small intestine and large intestine. This is 7-10 meters in Length, it begins at the mouth and ends at the anus.

2. Accessory Organs of Digestion

These release substances into the digestive tract through ducts. Structures include the salivary glands, liver, gall bladder and pancreas.

ALIMENTARY CANAL OR GASTRO-INTESTINAL TRACT

MOUTH:

The mouth takes in food and liquids.

The teeth help to breakdown the food by a process called Mastication.

Saliva from the Salivary glands, parotid, Submandibular and sublingual glands lubricate the food with mucus until it becomes a mass called a bolus.

The tongue moves the bolus to the back of the throat and pushes it down the pharynx.

The breakdown of carbohydrates begins in the mouth.

PHARYNX (THROAT):

This is muscular tube passes the bolus down to the oesophagus. The epiglottis, a flap of cartilage, prevent the food from entering the lungs.

OESOPHAGUS (FOOD PIPE):

Consists of a muscular tube leading to the stomach. The wall of the oesophagus not only releases mucus to help break down the food but it also creates a wave of muscular contractions which propels the bolus down to the stomach. This process is called Peristalsis.

STOMACH:

This is a J shaped sac situated on the left hand side of the body beneath the diaphragm.

It is lined with folds of rugae that allow it to stretch and contract.

The bolus enters the stomach, where it is broken down further into a liquid called Chyme by gastric juices containing enzymes and hydrochloric acid which kills bacteria.

The breakdown of proteins begins in the stomach.

SMALL INTESTINE:

This is approximately 6-7 metres long and divided into 3 parts.

1. Duodenum
2. Jejunum
3. Ileum

The wall of duodenum secretes mucus to protect it from the acidic chyme from the stomach.

Cells of small intestine secrete enzymes to digest proteins, carbohydrates and fats.

Digestive Juices from the liver and pancreas enter via an opening in the duodenum to help the process.

The surface of the small intestine consists of tiny projections called VILLI which increase the surface space for absorption of nutrients.

Nutrients are passed into the blood stream and waste materials and indigestible products are moved into the large intestine.

LARGE INTESTINE (COLON)

Large intestine consists of 3 parts:

1. Ascending colon
2. transverse colon
3. Descending colon

Any remaining liquid from the waste products and undigested food is removed and reabsorbed into body. The remainder becomes solid faeces.

SIGMOID COLON

The Sigmoid colon is located on the lower part of the descending colon as it forms a 'S' shape. The Sigmoid colon empties into the rectum.

APPENDIX

This is a small blind tube containing lymphoid tissue located in the large intestine attached to a small pouch called the cecum. Inflammation of this tissue is known as appendicitis.

RECTUM

The waste material is stored here before being passed down the anal canal and through an opening out of the body called the anus.

ENZYME

The organic catalyst which speeds up a chemical reaction but is not changed in the reaction.

SPHINCTER

Permit the passage of substances in one direction only.

PERISTALSIS

Wave like motion in the wall of an organ that propels the substances along.

ACCESSORY ORGANS OF DIGESTION:

SALIVARY GLANDS:

Salivary glands produce Saliva that moistens the food and helps the process of mastication, reduce bacterial growth, clean the teeth and mouth. Saliva contains mucus and salivary amylase, an enzyme which helps converts starch to sugar.

PANCREAS:

The Pancreas is located behind the stomach, between the Spleen and the duodenum. It provides pancreatic juices containing enzymes to the duodenum via the pancreatic duct:

Lipase (Fat digestion)

Amylase (Starch digestion)

Trypsin (Protein Digestion)

LIVER:

The liver is situated on the right side of the body beneath the diaphragm. It has 2 lobes, the right lobe is connected to the gall bladder by a duct.

Produces bile which is stored in the gall bladder and secretes bile to help breakdown fat.

Filters blood from the hepatic portal Vein removing dead red blood cells, excess proteins etc.

Detoxifies alcohol and drugs from the blood. The liver breaks down toxins converting them into less harmful substances.

Stores:

Vitamins: A B12, D, E, K

Glycogen and converts it back to glucose to meet energy requirements iron from the breakdown of red blood cells.

GALL BLADDER:

A pear shaped organ situated behind and attached to the liver by the bile and cystic ducts.

Stores access bile for the duodenum to emulsify fats.

Secretes mucus.

DISEASES AND DISORDERS

1. **Ulcers:** An excessive amount of acid in the gastric and intestinal juices causes a break in the lining of the alimentary canal.
2. **Diverticular Disease:** The development of sac like pouches in the wall of the large colon that can become inflamed. Symptoms include vomiting, abdominal distension, constipation and diarrhoea.
3. **Hyper Acidity:** Gastric juices together with the contents of the stomach re enter the oesophagus causing inflammation to its lining.
4. **Irritable Bowel Syndrome:** Disease of the gastrointestinal tract. symptoms include bouts of diarrhoea, constipation or bloating. It may be connected to allergies, food sensitivities and stress.
5. **Obesity:** Overweight usually caused by eating too much together lack of exercise. Body mass index BMI of over 30 indicated an individual is obese.
6. **Anorexia:** Lack of appetite for food.

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