

Anatomy and physiology of the digestive system essay sample



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The digestive system is basically a tube running through the body from the mouth to the anus. The organs of the digestive system include the oral cavity (mouth), esophagus, stomach, small and large intestine and rectum. Their role is to break down food and deliver the products to the blood for dispersal to the body cells. The undigested food that remains in the tract leaves the body through the anus as feces. The break down activities that begin in the mouth are completed in the small intestine. From that point on, the major function of the digestive system is to reclaim water. The liver is considered to be a digestive organ, because the bile it produces helps to break down fats. The pancreas which delivers digestive enzymes to the small intestine, also in functionally a digestive organ.

Mouth

The process of digestion begins in the mouth where food is chewed until it reaches a consistency whereby it can be swallowed. The following accessory structures aid this early stage of digestion: Tongue — a muscle that is covered by taste buds. It assists the process of chewing and manoeuvres food to a position where it can be swallowed easily. Salivary glands — begin the process of chemical digestion through the secretion of the enzyme, salivary amylase. This enzyme begins the process of breaking down carbohydrates. Saliva also moistens food which helps it to be swallowed more easily. Teeth — break food down mechanically into smaller particles that may be ingested more easily. Pharynx — allows the passage of both food and air.

Esophagus — tube that leads to the stomach.

Esophagus

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The esophagus is the tube or gullet connecting the mouth to the stomach. It lies in front of the vertebral column and behind the trachea (breathing tube) and heart. Stomach Food remains in the stomach for 3 to 4 hours. During this time it is further broken down by the muscular churning action of the stomach. Powerful gastric juices are also secreted by the cells of the stomach, contributing to chemical digestion. The food ends up in a semi-liquid form that is called chyme. Small Intestines

A long, thin tube about 1 inch in diameter and about 10 feet long that is part of the lower gastrointestinal tract. It is located just inferior to the stomach and takes up most of the space in the abdominal cavity. The entire small intestine is coiled like a hose and the inside surface is full of many ridges and folds. These folds are used to maximize the digestion of food and absorption of nutrients. By the time food leaves the small intestine, around 90% of all nutrients have been extracted from the food that entered it.

Large Intestine

A long, thick tube about 2 ½ inches in diameter and about 5 feet long. It is located just inferior to the stomach and wraps around the superior and lateral border of the small intestine. The large intestine absorbs water and contains many symbiotic bacteria that aid in the breaking down of wastes to extract some small amounts of nutrients. Feces in the large intestine exit the body through the anal canal. Pancreas

The pancreas is what is called both an endocrine and exocrine gland. It produces pancreatic juices, containing enzymes, which play an important role in the chemical digestion of food. The pancreas also produces the

hormones insulin and glucagon directly into the bloodstream, which is termed an endocrine function. Function of Digestive System

The Digestive System performs the following vital activities: Ingestion which involves the taking in of food

Digestion which may take two forms:

mechanical breakdown of food by chewing and the action of muscles within the digestive tract. chemical breakdown of food by enzymes produced at various stages of the digestive tract. Absorption is where substances pass through the walls of parts of the digestive tract into the bloodstream. 90 % of the absorption of all nutrients takes place in the small intestine. The other 10 % take place in the stomach and large intestines. Elimination is the process by which undigested foods leave the body. Digestion is controlled by the autonomic nervous system.

Food moves along the GIT by a wave like motion called peristalsis that breaks down the food mechanically. Food is also broken down chemically by the action of enzymes and bacteria. In the duodenum, food is acted upon by bile that is secreted by the gall bladder, juices from the pancreas and secretions from the wall of the duodenum. Fats are changed to fatty acids and glycerol, carbohydrates to simple sugars and proteins to amino acids. Most of the absorption of nutrients takes place in the ileum through small projections called villi. Any undigested food and water moves into the colon. Movement is slow in this section and it is anywhere from 16-24 hours before waste is evacuated. This evacuation is a reflex action and is called defecation. It occurs as the rectal sphincter responds to a filling of the colon

and can be voluntarily inhibited by keeping the external sphincter contracted.