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BIOMEDICAL ENGINEERING

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ANATOMY

The parts involved in this process are:

- Mouth
- Oesophagus
- Stomach
- Small intestine
- Large intestine
- Pancrease
- Anus
- **The mouth:**The mouth is the entry point for food, but the digestive system often gets ready before the first piece of food even enters our mouth. Saliva is released by the salivary glands into our oral **cavity** when we smell food. Once the food enters the mouth, chewing (mastication) breaks food into smaller particles that can be more easily attacked by the enzymes in saliva.

Oesophagus: The act of swallowing is a complex process that closes the windpipe (to protect our lungs) and moves food into the esophagus. This process is mostly automatic (reflex) but it is also partially under our direct control.

Once it enters the esophagus, food is moved down the esophagus and into our stomach. The esophagus is a muscular tube that contracts in a synchronized fashion (peristalsis) to move food down towards the stomach. While the muscles behind the food product contract, the muscles ahead of the food relax, causing the forward propulsion of the food. Peristalsis is the main mechanism by which food moves through our digestive system.

The stomach and small intestine

From glands that line the stomach, acid and enzymes are secreted that continue the breakdown process of the food. The stomach muscles further mix the food. At the end of this process, the food you placed in your mouth has been transformed to a thick creamy fluid called chyme.

This thick fluid is then pushed into the duodenum (the first part of the small intestine). With the help of enzymes from the pancreas and bile from the liver, further breakdown of the food occurs in the small intestine.

The small intestine has three segments. The first segment is the duodenum where further breakdown of the food takes place. The next two parts of the small intestine (jejunum and ileum) are mostly responsible for the absorption of nutrients from the processed food into the bloodstream through the walls of the intestine.

After the small intestine, the leftover waste leaves the upper gastrointestinal tract (upper GI tract) which is made up of everything above the large intestine.

Pancreas: Although the pancreas is mostly known for its blood sugar regulatory function with the production of insulin (as part of the endocrine system -- the insulin goes directly from the gland into the bloodstream), it is the main producer of digestive enzymes as part of the exocrine system (the enzymes produced by the gland pass through a duct into the intestine)

The first step to obtaining nutrition is ingestion, a process where food is taken in through the mouth and broken down by teeth and saliva. Digestion is the mechanical and chemical break down of food into small organic fragments. Mechanical digestion refers to the physical breakdown of large pieces of food into smaller pieces which can subsequently be accessed by digestive enzymes. In chemical digestion, enzymes break down food into the small molecules the body can use.

For the fried rice which is carbohydrate: digestion begins in the mouth. The salivary enzyme amylase begins the breakdown of food starches into maltose, a disaccharide. As the food travels through the esophagus to the stomach, no significant digestion of carbohydrates takes place. The acidic environment in the stomach stops amylase from continuing to break down the molecules.

The next step of carbohydrate digestion takes place in the duodenum. The chyme from the stomach enters the duodenum and mixes with the digestive secretions from the pancreas, liver, and gallbladder. Pancreatic juices also contain amylase, which continues the breakdown of starch and glycogen into maltose and other disaccharides. These disaccharides are then broken down into monosaccharides by enzymes called maltases, sucrases, and lactases. The monosaccharides produced are absorbed so that they can be used in metabolic pathways to harness energy. They are absorbed across the intestinal epithelium into the bloodstream to be transported to the different cells in the body.

For the chicken: A large part of protein digestion takes place in the stomach. The enzyme pepsin plays an important role in the digestion of proteins by breaking them down into peptides, short chains of four to nine amino acids. In the duodenum, other enzymes – trypsin, elastase, and chymotrypsin – act on the peptides, reducing them to smaller peptides. These enzymes are produced by the pancreas and released into the duodenum where they also act on the chyme. Further breakdown of peptides to single amino acids is aided by enzymes called peptidases (those that break down peptides). The amino acids are absorbed into the bloodstream through the small intestine.

For salad: from the mouth where the food is broken down and some enzymes act on it, then to the passage(oesophagus) then to the stomach where all the necessary nutrients are absorbed, then large intestine absorbs vitamins, and to decay the undigested food materials to form faeces.

For water: if taken on an empty stomach it goes directly into the intestine. And it also aids in digestion and makes it easy and also to wash down nutrients. Our bodies are made up of more than 50 percent water. Water is necessary to help our blood carry nutrients and waste around the body and to help the chemical reactions that occur in our cells. Water forms most of sweat, saliva and tears.