

The life of bread



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The human digestive system is very complex, however it can be briefly and simply explained by observing a piece of bread as it travels through the digestive system. The bread begins its journey by entering the mouth. Here it is mechanically digested. This means the teeth grind and smash the food into smaller pieces which are easier to move through the digestive system and easier to digest in the later stages. Except for mechanical digestion, other important things happen in the mouth. The enzyme called amylase is released.

This enzyme begins to break down the carbohydrates in the bread. As well as this mucus is released. Mucus helps to lubricate the food so that it can travel through the oesophagus. The bread travels through the oesophagus by the process of peristalsis. This is the process which makes things move by the contractions and relaxations of circular and linear muscles along the oesophagus. This process also occurs in the intestines. From the oesophagus, the bread enters the stomach. Several things happen here. Firstly the stomach contains hydrochloric acid.

This helps to sterilise the food we eat by killing off harmful bacteria. As well as this, the acid creates the optimum pH (around pH 2) for enzymes such as pepsin which breaks down the proteins in the bread into peptides. Enzymes digesting food, is called chemical digestion. An enzyme is a biological catalyst that speeds up chemical reactions without being used up themselves. The stomach also does mechanical digestion. It does this by churning up the food. The partially digested bread then goes to the small intestine.

The small intestine is very well adapted to the process of absorption. It has three parts; the duodenum, the ileum and the colon. The partially digested bread enters the duodenum first. Here the pH is alkaline, again to create optimum conditions for the enzymes to work. Enzymes are made in the pancreas and released into the duodenum. Enzymes such as amylase, trypsin and lipase are produced in the pancreas. Bile, made in the liver is also secreted into the duodenum, the job of bile is to emulsify the fats in the bread.

This increases the surface area of the lipids which increase the rate of reaction with the enzymes. Bile is stored in the gall bladder and is secreted through the bile duct. The now digested molecules of the bread have become fatty acids and glycerol (from lipids) glucose (carbohydrates) and amino acids (from proteins) these particles can now be absorbed into the body. This happens in the next part of the small intestine; the ileum. The walls of the ileum are lined with tiny villi, these are very well adapted to absorption of food.

They have a good blood supply and increase the surface area so that food has more room to absorb quickly. They have very thin membranes to allow digested food through easily and they are covered with even smaller, microvilli. By the time food passes the ileum and enters the colon all of the digested molecules would have been absorbed into the body. All that remains of the bread now is any undigested matter, this is mostly made of cellulose, and water. The job of the colon is to absorb water. This leaves the semi-solid faeces which are stored in the rectum until expelled from the anus.