Journey of Food

**Food Chosen: Pasta**

**Mouth and Oesophagus:**

First the pasta enters the mouth and is broken down using mechanical digestion from the teeth tongue and jaw working together to break down the pasta. While this is happening, the tongue is working to form the pasta into the bolus formation and the salivary glands are producing saliva to moisten the pasta to swallow the pasta easier and the saliva contains an enzyme used to begin the breakdown of the starch in the pasta. When the pasta is in the bolus formation the tongue pushes it into the oesophagus while the oesophagus goes through peristalsis to push the food down, the epiglottis is closed to allow the food to travel to the stomach and prevent the food from entering the lungs.

**Stomach:**

Mechanical digestion of pasta occurs by the contractions of the stomach in a variety of ways to churn and mix the food with the stomach juices, this is due to the layers of oblique, circular and longitudinal muscles to make up the stomach. While this is happening the chemical digestion of the stomach includes the breakdown of the protein in the pasta by the enzyme secreted by the gastric glands in the stomach, pepsin which is activated in the presence of hydrochloric acid. Nothing gets absorbed in the stomach as the mucous layer is too thick, this occurs for about 2-8 hours until it is pushed into the duodenum (small Intestine) via peristalsis.

**Small Intestine**

The pasta travels through the pyloric sphincter into the duodenum where it enters the small intestine. The small intestine continues the digestion via the intestinal juices. The pancreas creates pancreatic juice helps to neutralize the acid that has come from the stomach but also contains many enzymes for digestion, including pancreatic amylase and pancreatic protease. Pancreatic amylase breaks down polysaccharides into disaccharides then from disaccharides intestinal amylase digests it into monosaccharide. Pancreatic protease digests polypeptides into peptides then the intestinal protease digests the peptides even further to form amino acids.

**Small Intestine**

The structure of the small intestine is suited to the function of absorption as there is an inner mucosa layer which is folded and contains villi and microvilli, lacteal is within the villus surrounded by a network of blood capillary. The muscular movement of the wall of the stomach constantly brings the villi into contact with the material. Simple sugars such as glucose is absorbed through a cell membrane through facilitated diffusion while amino acids are also absorbed through facilitated diffusion. Simple sugars and amino acids (breakdown of proteins) are absorbed in the blood capillaries then these nutrients are carried to the liver and may be removed for further processing or remain in blood for cells.

**Material Breakdown and Use**

Pasta includes mainly starch and protein of these breakdown into glucose and amino acids respectively. Starch begins the digestion in the mouth where salivary amylase is used to breakdown the polysaccharides into disaccharides then before being absorbed the disaccharides are broken down further into monosaccharides via the brush border enzymes:  sucrase-isomaltase, lactase phlorizin hydrolase, maltase-glucoamylase and trehalase. Then the simple sugars are absorbed in the small intestine through facilitated diffusion and active transport. Protein breaks down into polypeptides in the stomach then in the small intestine pancreatic protease breakdowns the polypeptides into smaller peptide chains which are called peptides, then further being broken down into in the small intestine the intestinal protease breaks the peptides into amino acids to be absorbed by facilitated diffusion and active transport.

**Large Intestine**

The large intestine with the presence of the remains of the pasta will absorb some of the water present which cause the contents to become more solid. In the large intestine bacteria breakdown, the remaining organic compounds. This creates faeces.

**Elimination and Faeces**

Faeces is the collection of water, undigested food, bacteria, bile pigment and remains of the cells. These are the metabolic waste product of consuming food and the removal of this is referred to as elimination, this includes the faeces being pushed out of the rectum through peristalsis but as that occurs the walls of the rectum stretch and trigger defaecation. Defaecation is the relaxation of the muscle around the anus so the faeces can be passed.