**Food**: White bread

**Mouth and Oesophagus**

* **Mouth**-The mouth is the beginning of the digestive tract. It is where materials/substances are able to be ingested. The mouth is where mechanical and chemical digestion begins. In this presentation, the digestion of white bread will be depicted.
* **Teeth**-The teeth’s main role is to break up food into smaller pieces. Chewing is a process done by jaw movements and the teeth. With each bite, more saliva is produced.
* **Salivary** **glands**-The salivary glands are located under the tongue, chin and behind the lower jaw. Bread is a starch food so it is in this scenario where chemical digestion starts. Specified enzymes called amylase in saliva is released from the glands, allows for the breakdown (chemical reaction between starch and water/saliva) of starch into simple sugars-carbohydrate molecules.
* **Epiglottis**-The epiglottis is a ‘flap’ of cartilage that sits behind the tongue and in front of the larynx. Its primary role in digestion is to prevent food and drink from entering an individuals windpipe.
* **Oesophagus**-A muscular tube known as the oesophagus, is the vessel that links the pharynx to the stomach. The oesophagus contains oesophageal sphincters (upper and lower) that facilitate the direction of food during digestion. The oesophageal sphincters are closed to prevent up flow of stomach acids however open when swallowing. To aid in the ease of swallowing, the oesophagus is lined with mucus which allows the bread to ‘slide’.

**Stomach**

After the bolus of bread is dispelled into the stomach, the muscles within the stomach begin to squeeze and churn the food -this is the process of mechanical digestion. It is in the stomach where specific protein-digesting enzymes, (proteases) and stomach acid split protein molecules into singular amino acids. The product left after this process is called chyme. It is important to note that the chemical digestion of starch stops due to enzymes (amylase) becoming inactive once reaching the stomach. It generally takes two to four hours for a persons stomach to be ‘emptied’ but should be recognised several factors may influence this such as size of the meal eaten, hormones etc.

**Small Intestine (breakdown)**

The pyloric sphincter separates the stomach from the small intestine and it is this muscle that allows the chyme to be released into the small intestine. As of entering the upper portion of the small intestine, the chyme prompts the pancreas to secrete a fluid that contains bicarbonate to neutralize the acid, lipase to breakdown fats, amylase for any presence of starches, and proteases to digest proteins. The gall bladder also comes into effect when digesting bread. Fats found in bread get emulsified by bile secreted from the gall bladder (due to it contracting). The left over product is called globules and this will aid in the fat absorption process. In the small intestine the bread can take anywhere between two to six hours to process.

**Small Intestine (absorption)**

For complete absorption, a large surface area is required. This is achieved by folds and wrinkles in the walls of the intestinal lumen. Alongside this to further increase its surface area, finger like projections called villi cover the folds and even further than that, smaller projections called microvilli are attached to them. Muscular movements of the intestinal wall, allows for continuous movement of villi. The movement allows the villi to touch the material within the small intestine. Within the villus is a lymph capillary (lacteal), surrounded by a network of blood capillary. Ways in which absorption occurs is through transportation of nutrients. Simple diffusion occurs with a high nutrient concentration within the small intestine and then the cells that line the villi. Active transport is another way the small intestine absorbs nutrients. Villi cells, will use energy to go against the concentration gradient. From the villi walls, simple sugars, the limited amino acids (phenylalanine, tryptophan, valine and isoleucine),water and water soluble vitamins in found in bread are absorbed into blood.

**Material Breakdown and Use**

Found in the breakdown of white bread is amino acids. Amino acids in the body are useful for the creation ofproteins. Proteins are able to provide structural framework, movement and the speed of chemical reactions (breakdown of food as well as growth and repair of tissue). Simple sugars brough by starch (monosaccharide-glucose) is useful for cellular energy. Another organic compound found in white bread is fat, also referred to as lipids. Lipids have a basic unit of glycerol and fatty acids, in bread this is triglycerol. Lipids are a good source of an energy reserve when if lacking can be used (via fat storage).

**Large intestine**

In the large intestine, osmosis occurs as a response to a osmotic gradient due to absorption of electrolytes. Within the colon are trillions of bacteria that are able to produce vitamins (like vitamin K and B). These vitamins are able to be absorbed into the blood and help when dietary intake of those vitamins, are low. Minerals on the other hand (such as sodium) are absorbed via protein channels and potassium can either be absorbed or secreted however, this will depend on concentration within the lumen. Dehydration of the material, combined with peristaltic waves, helps compact the chyme.

**Elimination and Faeces**

The remaining contents after large intestine absorption, are mostly solid. Faeces contain water, undigested food, bacteria, bile pigment and cell remains. The walls of the rectum are able to stretch and when they do so they initiate defaecation (discharge of faeces). Faeces leave the body via the anus. The anus is a circular muscle (anal sphincter) that is the opening of the rectum. it takes up to 36 hours for food to move through ones entire colon.

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