The Journey of Pasta

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Introduction

This report will be about the journey of pasta through the digestive system. We will be moving through the mouth all the way to the anus showing how pasta is digested and broken down in all parts of the digestive system.

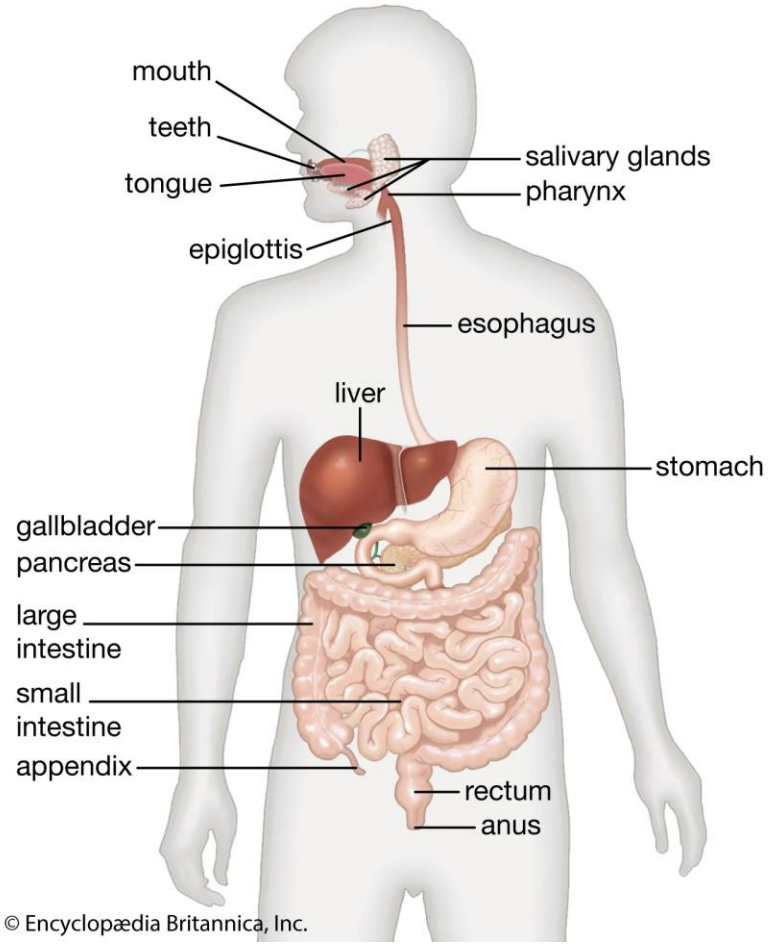

Figure 1.1: Labelled diagram of digestive system

Mouth and Esophagus

The digestion of pasta starts in the mouth with the mechanical breakdown of the pasta. The teeth grind up the pasta, increasing its surface area so it can be chemically broken down. The saliva in the mouth covers the pasta coating it with enzymes that start to disintegrate the carbohydrates of the pasta and give it a slippery covering for it to slide down the esophagus into the stomach. The complex carbohydrates get broken down into maltose, a sugar molecule, as soon as chewing begins. "Chemical reaction speeds up the reactions in the body by these enzymes" (Ashlee Adams, 2012). The epiglottis is a flexible flap at the higher end of the larynx, and acts as a switch between the esophagus and larynx allowing air into the airway to the lungs and food to pass the gastrointestinal tract (Inner body research, 2022). The pasta then slides through the esophagus into the stomach.

Stomach

The stomach is the last part of mechanical digestion, and the first site of protein digestion. On average, the pasta spends 30 – 60 minutes in the stomach. The protein in the pasta is now chemically broken down as a result of the gastric juices. Because acids stop enzymes from working, the amylases from the saliva stop digesting the carbohydrates once they reach the acidic stomach (Cole, n.d.). The mix of enzymes and digestive juices in the stomach helps break down the pasta so it can pass to the small intestine. The stomach also holds the pasta until it is ready to pass to the small intestine (Cleveland Clinic, 2021). The acids produced in the stomach also destroy bacteria in the pasta (Kaiser, 2018). The past is now partly digested and moves through the pyloric sphincter into the duodenum, the first part of the small intestine (Cole, n.d.).

Figure 1.2: An image of cooked pasta

Small Intestine

The duodenum is the first part of the small intestine, where most of the chemical digestion of lipids and carbohydrates occur. The duodenum receives secretion from the liver, the pancreas, and the gall bladder. The carbohydrates now get broken down into glucose molecules. The glucose molecules are then carried to the liver through the blood stream where it is stored and used to provide energy (Adams, 2012). The fat in the pasta is also broken down by an enzyme called bile. The pancreas produces proteases, lipase, and carbohydrates that help in the chemical digestion of pasta. This also takes place in the duodenum. The remains of the pasta that cannot be put to use will be sent to the large intestines through the ileocecal valve.

Small Intestine

The walls of the small intestine are lined with villi which contain blood vessels that absorb the products of carbohydrate and protein digestion. Lacteals are lymphatic vessels in the villi that absorb fats from pasta (Cole, n.d.). The villi are a great surface area and absorb the nutrients required. Glucose, fructose, and galactose are absorbed across the membrane of the small intestine and delivered to the liver for use or further distribution to the rest of the body. The microvilli help increase the surface area of the cell and facilitate the absorption of the ingested food (Kitts, 2022).

Material Breakdown and Use

Pasta is high in carbohydrates and contains protein, fiber, and fats. “Dietary carbohydrates are digested to glucose, fructose and/or galactose, and absorbed into the blood in the small intestine” (Kitts,2022). There are also many factors that can influence the digestion and absorption of dietary carbohydrates. The primary energy source of the body is glucose. Starches and sugars are major dietary sources of glucose. Protein absorption occurs in the small intestine where it is broken down into amino acids. The amino acids are released into your bloodstream once they have been absorbed (Dix, 2021). Fats are broken down into fatty acids during digestion, which can then be absorbed into the blood (Nemours, 2022). Fatty acids have many important uses in the body and are used as energy if glucose is not available.

Large Intestine

All the remains that cannot be put into use are sent to the large intestine (Adams, 2012). The large intestine is “where bacteria can further digest the wastes of pasta, which may create gas, and where some water may be reabsorbed into the body” (Cole, n.d.). One the pasta has reached the large intestine it can no longer be reabsorbed into the bloodstream as the large intestine has no villi. The main function of the large intestine is to remove the moisture and water from the pasta (Adams, 2012). From the large intestine the water is sent into the bloodstream. “The pasta spends about 12 hours in the large intestine” (Adams, 2012).

Elimination and Feces

The wastes of pasta go through the cecum, the ascending colon, the transverse colon, the descending colon, the sigmoid colon, and the rectum before they reach the anal canal as feces and leave the body. Until it leaves the body, the pasta is stored in the rectum. The anal is the last portion of the large intestine and supports people when eliminating feces from their body.

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