

Topic: Nutrition
Class: B.Sc Part –III (Hons.)
Paper- V
Group – B

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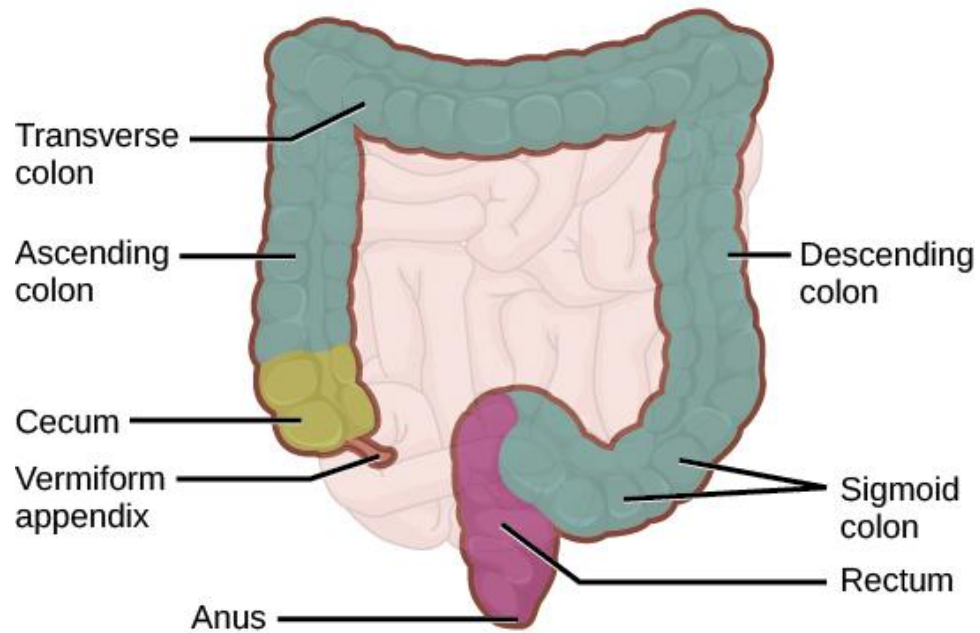
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Small Intestine

- Chyme moves from the stomach to the small intestine.
- The small intestine is the organ where the digestion of protein, fats, and carbohydrates is completed.
- The small intestine is a long tube-like organ with a highly folded surface containing finger-like projections called the villi.
- The top surface of each villus has many microscopic projections called microvilli

Intestine



- . The epithelial cells of these structures absorb nutrients from the digested food and release them to the bloodstream on the other side.
- The villi and microvilli, with their many folds, increase the surface area of the small intestine and increase absorption efficiency of the nutrients.

- The human small intestine is over 6 m (19.6 ft) long and is divided into three parts:
- The duodenum,
- The jejunum and
- The ileum.
- The duodenum is separated from the stomach by the pyloric sphincter.
- The chyme is mixed with pancreatic juices, an alkaline solution rich in bicarbonate that neutralizes the acidity of chyme from the stomach.

- Pancreatic juices contain several digestive enzymes that break down starches, disaccharides, proteins, and fats.
- Bile is produced in the liver and stored and concentrated in the gallbladder; it enters the duodenum through the bile duct.
- Bile contains bile salts, which make lipids accessible to the water-soluble enzymes. The monosaccharides, amino acids, bile salts, vitamins, and other nutrients are absorbed by the cells of the intestinal lining.
- The undigested food is sent to the colon from the ileum via peristaltic movements.
- The ileum ends and the large intestine begins at the ileocecal valve. The vermiform, “worm-like,” appendix is located at the ileocecal valve.
- The appendix of humans has a minor role in immunity

- **Large Intestine**

- The large intestine reabsorbs the water from indigestible food material and processes the waste material .
- The human large intestine is much smaller in length compared to the small intestine but larger in diameter.
- It has three parts: the cecum, the colon, and the rectum.
- The cecum joins the ileum to the colon and is the receiving pouch for the waste matter.
- The colon is home to many bacteria or “intestinal flora” that aid in the digestive processes.
- The colon has four regions, the ascending colon, the transverse colon, the descending colon and the sigmoid colon.
- The main functions of the colon are to extract the water and mineral salts from undigested food, and to store waste material

- The large intestine reabsorbs water from undigested food and stores waste until it is eliminated.
- The rectum stores feces until defecation.
- The feces are propelled using peristaltic movements during elimination.
- The anus is an opening at the far-end of the digestive tract and is the exit point for the waste material.
- Two sphincters regulate the exit of feces, the inner sphincter is involuntary and the outer sphincter is voluntary

Accessory Organs

- The organs discussed above are the organs of the digestive tract through which food passes.
- Accessory organs add secretions and enzymes that break down food into nutrients.
- Accessory organs include the salivary glands, the liver, the pancreas, and the gall bladder.
- The secretions of the liver, pancreas, and gallbladder are regulated by hormones in response to food consumption.
- The liver is the largest internal organ in humans and it plays an important role in digestion of fats and detoxifying blood.
- The liver produces bile, a digestive juice that is required for the breakdown of fats in the duodenum.

- The liver also processes the absorbed vitamins and fatty acids and synthesizes many plasma proteins.
- The gallbladder is a small organ that aids the liver by storing bile and concentrating bile salts.
- The pancreas secretes bicarbonate that neutralizes the acidic chyme and a variety of enzymes for the digestion of protein and carbohydrates
- The pancreas secretes bicarbonate that neutralizes the acidic chyme and a variety of enzymes for the digestion of protein and carbohydrates
- The where most of the protein gets digested. (credit: modification of work by Mariana Ruiz Villareal)stomach has an extremely acidic environment