ASSIGNMEN

ANSWERS TO THE QUESTION

1. Describe functions of each region of the gastro intestine tract.

Answer

GIT is divided into two, (A) consist of organs that are collectively as a continuous tube, that is Mouth, Pharynx, esophagus, stomach small intestine, large intestine, and Anus, (B) are accessory organs connected to, but continuous with the organ of the (A) that is, teeth, tongue, salivary gland, pancreas, liver, gallbladder.

Therefore, each region has its function as stated below:

Mouth; contains the oral cavity,

* For starch hydrolysis catalyzed by amylase secreted by salivary gland.
* Absorption of some amount of vitamin C and varieties of non-nutrient including nicotine.
* For fat hydrolysis catalyzed by lingual lipase secreted by tongue.

Stomach

* Reservoir of food eaten.
* For secretion of intrinsic factor required for the absorption of vitamin B12.
* Denaturation of dietary and release of vitamin B12, iron and other minerals from protein binding for which gastric acid is important.
* Protein hydrolysis catalyzed by pepsin.
* Fat hydrolysis catalyzed by lipase.

Small intestine (duodenum, jejunum, and ileum)

* Hydrolysis of disaccharide within brush border of the intestinal mucosa.
* Protein hydrolysis catalyzed by a variety of exo- and endo peptidase secreted by the pancreas and the small intestine.
* Starch hydrolysis catalyzed by amylase secreted by pancreas.
* Hydrolysis of di- and tripeptide within brush border of the intestinal mucosa.
* Fat hydrolysis by lipase secreted by pancreas.
* Absorption of the product of digestion.
* Absorption of water, failure of it to absorb leads to diarrhea and dehydration.

Large intestine

* Absorption of water.
* Bacterial metabolism of un digested carbohydrate and shed intestinal mucosa cells.
* Absorption of some of bacterial metabolism.

Rectum

* Storage of un digest gut content prior to evacuation as faces.

1. Explain the digestion and absorption of lipids, the role of bile salts and the formation of chylomicrons.

The digestion of lipid are in three phase as explain below,

* Digestion is the breakdown of food polymers into monomers for easy absorption, lipids digestion starts from mouth, stomach, and small intestine.

1. Mouth, this is the starting point of lipid digestion where by lingual lipase secreted by tongue to act on the lipid and then it to pass into the stomach.
2. Stomach, in this phase lipid is hydrolyze by lipase secreted by pancreas, and this the initial lipolysis account for 10-30% of the total hydrolysis of the ingested triglycerol.
3. The small intestine, on leaving the stomach the first emulsification is modified by mixing with bile and pancreatic juice. Bile contain bile acids as glycine and taurine conjugate of the trihydroxylated cholic acid and dihydroxylated chenodeoxycholic acid and phospholipid billary is proportional to the amount of the fat in the diet.

The final emulsified lipid in micelles containing free fatty acid with small amount of intact triacylglycerol, monoacyglycerol, phospholipids, cholesterol and fatty soluble vitamins are absorbed across intestinal walls into the mucosal cells. There the fatty acids are re-esterified to form triacylglycerol and packaged together with protein synthesized in the mucosal cells to form **Chylomicrons**. These are secreted in the lacteal in the centre of the vilius and enter the lymphatic system which drains into bloodstream at the thoracic duct.

Bile is a complex fluid containing water electrolytes and battery of organic molecules including bile acids cholesterol, phospholipids and bilurubin that follows through the billary tract into the small intestine.

Roles includes the following,

* Emulsification of lipid aggregate; Bile acid have detergent on particles of dietary fat which cases fat globules to breaks down or be emulsified into minute microscopic droplet. Emulsification is not digestion per se but, is of important because it higly increases the surface area of fat, making it available for digestion by lipase, which cannot access the inside of lipid droplet.
* Solibulisation and transport of lipid in an aqueous environment. Bile salt are lipid carriers and are able to solibulize many lipids by forming micelles, aggregate of lipid such as fatty acid, cholesterol, monoglycride that are suspended in water.
* Bile acids are also critical for the transport and absorption of the fat soluble vitamins.

1. Describe the absorption of minerals, especially iron.

Answer

Mineral is one of the six essential nutrient required for circulatory system and its regulation, and are mostly absorbed by carrier-mediate diffusion into intestinal mucosal cells, and accumulated by binding to intracellular protein. This is then sodium-dependent active transport from epithelia cell into the bloodstream, where again they are usually bound to transport protein. Genetic defects of the intracellular binding protein are active transport system of the basal membrane of the mucosal cells and can result in functional deficiency despite an apparently adequate intake of mineral.

Mineral absorption is affected by other compounds present in the intestinal lumen, a number of reducing compound can enhance the absorption of iron, and number of chelating compound enhance the absorption of other minerals for example zinc absorption is dependent on the secretion by the pancreas of a zinc binding ligand.

Like other mineral, iron enters the mucosal cell by carrier-mediate passive diffusion and accumulated in the cells by binding to a protein ferritin in the mucosal cell is saturated with iron, no more can be taken up from the gut lumen. Iron can leave the mucosal cell on if there is free transferrin in plasma for it to bind and once plasma ferritin is saturated with iron any that has accumulated in the mucosal cells will be lost back into the intestinal lumen when the cells are shed at the tip of the villus.

1. Describe and explain the classification of amino acids according to their chemical and nutritional properties.

**Answer**

Amino acid is the building block of protein, and it is categorize into two,

* Indispensable (essential) amino acids and
* Dispensable (nonessential) amino acid.

Indispensable amino acid are the once that cannot be synthesized by the animal organism out of material ordinary available to the cells at speed commensurate with the demands for growth.

Examples of essential amino acids are,

1. Valine
2. Isoleucine
3. Leucine
4. Lysine
5. Methinonine
6. Phenylalanine etc.

Indispensable are very important in the diet that made it to be called a complete diet and are got from animal and its product, that is **meat, fish, chicken, eggs, milk etc**.

Whereas dispensable amino acids are those that can be synthesize by animal organism these includes the following,

1. Glutamic acid
2. Alanine
3. Serine
4. Aspartic acid
5. Asparagines.

These are obtained from plant of which two of them can be combined to give complete amino acid in the diet.

There are also conditional indispensable amino acids and these includes.

1. Glycine
2. Aginine
3. Glutamine
4. Proline
5. Tyrosine.

With these amino acid is a very important element required in our daily dietary meal that facilitate the growth and rehabilitation of body tissue.