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DEPARTMENT: BIOMEDICAL ENGINEERING

COURSE: HUMAN ANATOMY II (ANA 226)

ASSIGNMENT: Miss Egbe Amanda attended a birthday party organized by Mr. Solomon, during the party she was served fried rice, salad, fried chicken and water. Enumerate in details the digestive processess of the above food she ate during the celebration.

FRIED RICE

CARBOHYDRATES

The digestion of carbohydrates begins in the mouth, with the addition of amylase from our saliva. The digestion of carbohydrates is completed in the small intestine from enzymes from the intestinal mucosa and pancreatic juices. The carbohydrates are broken down into monosaccharides. These monosaccharides are absorbed by the villi in the small intestine. The monosaccharides are then diffused into the blood stream, so our body can use the molecules where they are needed.

Enzymes Involved

- a-Amylases (salivary and pancreatic) hydrolyze 1,4-glycosidic bonds in starch, yielding maltose, maltotriose, and a-limit dextrins.
- Maltase, a-dextrinase, and sucrase in the intestinal brush border then hydrolyze the oligosaccharides to glucose.
- Lactase, trehalase, and sucrase degrade their respective disaccharides lactose, trehalose and sucrose to monosaccharides.
    - Lactase degrades lactose to glucose and galactose.
    - Trehalase degrades trehalose to glucose.
    - Sucrase degrades sucrose to glucose and fructose.

FRIED CHICKEN

Protein digestion starts in the stomach, where it is partly broken down with stomach juices. Protein digestion is completed in the small intestine with enzymes from the small intestine and pancreatic juices. Large protein molecules are broken down into molecules called amino acids, which are then absorbed into the villi of the small intestine. The molecules are then carried away by the blood and used where our body needs them.

Digestion of proteins

- Dietary proteins are a source of amino acids which are utilized for formation of various cellular substances.
- Mostly, proteins must be broken down into amino acids for absorption. Digestive products of protein can be absorbed as amino acids, dipeptides, and tripeptides
- Both endopeptidases enzymes which degrade proteins by hydrolyzing interior peptide bonds and exopeptidases enzyme that hydrolyzes one amino acid at a time from the C-terminus of proteins and peptides are involved in the digestion of proteins.

- Digestion takes place in the stomach and the small intestine.

Enzymes Involved

- **Pepsin**
  - Pepsin is secreted in its zymogen form as pepsinogen by the chief cells of the stomach.
  - Pepsinogen is activated to pepsin by gastric H+. The optimum pH for pepsin is between 1 and 3.
  - Pepsin hydrolyzes proteins into peptones and proteoses.
  - When the pH is >5, pepsin is denatured. Thus, in the intestine, as HCO_3^- is secreted in pancreatic fluids, duodenal pH increases and pepsin is inactivated.
- **Pancreatic proteases**
  - The digestion is completed in the small intestine by the action of pancreatic and intestinal juice.
  - The proteases include trypsin, chymotrypsin, elastase, carboxypeptidase A, and carboxypeptidase B.
  - They are secreted in inactive forms that are activated in the small intestine as follows:
  - Trypsinogen is activated to trypsin by a brush border enzyme, enterokinase.
  - Trypsin then converts chymotrypsinogen, proelastase, and procarboxypeptidase A and B to their active forms.

SALAD

Vegetables are initially broken down in the mouth by mastication (physical breakdown) and amalayse (chemical breakdown)- an enzyme found in your saliva responsible for breaking down starch into sugars.

In the second part of digestion the food passes through to the stomach where it's broken down further by mechanical processes, acid and two enzymes, lipase (chemically breaks down fats) and pepsin (chemically breaks down proteins).

The remaining substance then passes into the small intestine via the duodenum where the nutrients and sugars are absorbed by the villi lining the intestinal wall into the bloodstream.

The remaining fibre that can't be digested (cellulose in plants) then passes through into the large intestine where the remaining water is absorbed and fibre is passed out from the body as faeces.

WATER

Water and other fluids follow the same journey as other food articles, but in their case, the process involves absorption, rather than digestion.

Water, on the other hand, is a very simple molecule, so our body doesn't have to break it down into smaller, simpler molecules. As a matter of fact, water molecules are so small that they have no problem diffusing through the phospholipid bilayer that forms the cell membrane of human tissues. This cell membrane (presumably) consists of small channels or pores through which water or water-soluble substances can enter, meaning that water is directly absorbed through the epithelial cells that cover humans' intestinal tract. In short, this means that the small intestine is responsible for the absorption of most of the water that we consume.

In addition, water is also absorbed by our large intestines by actively absorbing sodium and chloride ions, thus creating a water potential gradient that drives the diffusion of water into the cells lining the large intestine.