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**DEPARTMENT: BIOMEDICAL ENGINEERING.**

 **COURSE: ANATOMY**

**Question:**

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.**

**DIGESTION FOR THE RICE (CARBOHYDRATES)**

### 1. The mouth

You begin to digest carbohydrates the minute the food hits your mouth. The saliva secreted from your salivary glands moistens food as it’s chewed.

Saliva releases an enzyme called amylase, which begins the breakdown process of the sugars in the carbohydrates you’re eating.

### 2. The stomach

From there, you swallow the food now that it’s chewed into smaller pieces. The carbohydrates travel through your esophagus to your stomach. At this stage, the food is referred to as chyme.

Your stomach makes acid to kill bacteria in the chyme before it makes its next step in the digestion journey.

### 3. The small intestine, pancreas, and liver

The chyme then goes from the stomach into the first part of the small intestine, called the duodenum. This causes the pancreas to release pancreatic amylase. This enzyme breaks down the chyme into dextrin and maltose.

From there, the wall of the small intestine begins to make lactase, sucrase, and maltase. These enzymes break down the sugars even further into monosaccharides or single sugars.

These sugars are the ones that are finally absorbed into the small intestine. Once they’re absorbed, they’re processed even more by the liver and stored as glycogen. Other glucose is moved through the body by the bloodstream.

The hormone [insulin](https://www.healthline.com/health/type-2-diabetes/insulin) is released from the pancreas and allows the glucose to be used as energy.

### 4. Colon

Anything that’s left over after these digestive processes goes to the colon. It’s then broken down by intestinal bacteria. Fiber is contained in many carbohydrates and cannot be digested by the body. It reaches the colon and is then eliminated with your stools.

**DIGESTION OF THE SALAD (Fibre).**

**Fiber** is important for keeping the **digestive** tract working smoothly. Since we do not **digest** it, the **fiber** in food passes into the intestine and absorbs water. The undigested **fiber** creates "bulk" so the muscles in the intestine can push waste out of the body. Eating enough **fiber** helps prevent constipation. Unlike other food components, such as fats, proteins or carbohydrates — which your body breaks down and absorbs — **fiber** isn't **digested** by your body. Instead, it passes relatively intact through your stomach, small intestine and colon and out of your body.

But in the case of vitamins The food is **digested** by stomach acid and then travels to the small intestine, where it is **digested** further. Bile is needed for the absorption of fat-soluble **vitamins**. This substance, which is produced in the liver, flows into the small intestine, where it breaks down fats. Once you take your **vitamin** and it's broken down in your stomach, and then sent to the small intestine, it is **absorbed**. The small intestine is where all your **vitamins** are **absorbed**. Water-soluble **vitamins**, like **vitamin** C, are picked up in a section of the small intestine called jejunum.

**DIGESTION OF THE CHICKEN (PROTEIN).**

**Protein digestion** occurs in the stomach and duodenum in which 3 main enzymes, pepsin secreted by the stomach and trypsin and chymotrypsin secreted by the pancreas, break down food **proteins** into polypeptides that are then broken down by various exopeptidases and dipeptidases into amino acids. **Protein digestion** begins with the action of an enzyme called pepsin. ... Pepsin acts on **protein** molecules by breaking the peptide bonds that hold the molecules together. **Digestion of protein** is completed in the small intestine by the pancreatic enzymes trypsin, chymotrypsin, and carboxypeptidase. The **end product** of **protein digestion** is amino acids. Once consumed, **proteins** are **digested** and broken down into amino acids by enzymes. The digestion of protein entails breaking the complex molecule first into peptides, each having a number of amino acids, and second into individual amino acids. The pepsins are enzymes secreted by the stomach in the presence of acid that breaks down proteins (proteolysis). The pepsins account for about 10 to 15 percent of protein digestion. They are most active in the first hour of digestion, and their ability to break down protein is restricted by the necessity for an acidic environment with a pH between 1.8 and 3.5. The trypsins (proteolytic enzymes secreted by the pancreas) are much more powerful than pepsins, so the greater part of protein digestion occurs in the duodenum and upper jejunum. Therefore, even after total removal of the stomach, protein digestion usually is not impaired.

Pancreatic secretion contains inactive protease precursors that become enzymatically active after interacting with another enzyme, enterokinase, which is secreted from the microvillous component of the enterocytes in the duodenal and jejunal mucosa. Trypsinogen is activated in the intestine by enterokinase, which is liberated from duodenal lining cells by the interaction of bile acids and CCK. This activation of trypsinogen to trypsin is initiated by the cleavage from it of six terminal amino acid residues. The other proteases are activated by free trypsin. The net effect of these proteases is to reduce dietary proteins to small polypeptide chains of two to six amino acids and to single amino acids. Trypsin activates the other pancreatic proteases, including chymotrypsin and elastase. Trypsin, chymotrypsin, and elastase are known as endopeptidases and are responsible for the initial breakdown of the protein chains to peptides by hydrolysis. The next step, the breakdown of these peptides to smaller molecules and then to individual amino acids, is brought about by the enzymic activity of carboxypeptidases, which are also secreted by the pancreas.

Peptidase activity commences outside the enterocytes (in the mucus and brush border) and continues inside the cell. A different peptidase appears to be involved in each stage of the breakdown of protein to amino acids. Likewise, the transport of different peptides involves different mechanisms. Dipeptides (peptides that release two amino acids on hydrolysis) and tripeptides (peptides that release three amino acids) are moved from the surface brush border into the cell by an energy-requiring process involving a carrier protein. Small peptides with few amino acids are absorbed directly as such. The greater part of the breakdown of peptides to amino acids takes place within the enterocyte. Curiously, small peptides are absorbed more rapidly than amino acids, and, indeed, the precise details of the mechanism for absorption of amino acids are largely unknown. It is known that some amino acids have a specific individual transport system while others share one.

Amino acids may be classified into groups, depending upon their optical rotatory characteristics (i.e., whether they rotate polarized light to the left, or levo, or to the right, or dextro) and in terms of reactivity, or acidity (pH). Levorotatory amino acids are absorbed extremely rapidly—much more rapidly than are dextrorotatory amino acids. In fact, levorotatory amino acids are absorbed almost as quickly as they are released from protein or peptide. Neutral amino acids have certain structural requirements for active transport, and if these specific structural arrangements are disturbed, active transport will not occur. Basic amino acids, which have a pH above 7, are transported at about 5 to 10 percent of the rate of neutral levorotatory amino acids.

**DIGESTION OF WATER.**

Water is \*not\* digested by the body . Nevertheless it carries out many many important functions inside the body . The first big step the body takes is registering hydration through your mouth. After a few gulps of water, the brain will convince the body– that the body has had enough to drink.

This is an important hydration mechanism because it takes a long time for the water that was drunk to reach cells and provide them with sufficient hydration. If the brain registered hydration only after cells received water, people would be drinking way more than the body really needs.

The communication between the brain and mouth allows someone to stop drinking at the appropriate time, even if the water hasn’t fully hydrated the system yet.

### Water travels through Your esophagus

It is a small pipe connected to the mouth and lands in the stomach. This is where the process of water absorption to the bloodstream begins.

### Water and Your Stomach

The amount of water absorbed in the stomach and how quickly water is absorbed depends, in part, on how much has been eaten. If someone is drinking water on an empty stomach, they are more likely to experience a faster rate of water absorption.

Whereas, if a person has eaten a lot of food before they drink water, the speed of absorption will slow down accordingly, and absorption could take up to a few hours.

### Water and Your Small Intestine

The small intestine, at around 20 feet long, efficiently absorbs water into the cell membrane and bloodstream. From here, water will travel to cells across the body, providing them with the hydration to perform daily functions efficiently.

But the journey of the water you drink doesn’t stop there. Once absorbed into the body, water aids some vital functions.

### Water and Your Large Intestine

The large intestine is the key center for water reabsorption rather than the stomach and the small intestine because of the following reasons:

It prevents most of the paracellular flow of water and electrolytes because of tight junctions, unlike in the small intestine. This prevents the backflow of electrolytes and water from the chyle to the blood.

 It is mainly involved in concentrating the fecal matter, so reabsorption of water and electrolytes becomes its main function.

### Water and Your Kidneys

One such task is filtering toxins. This is primarily the job of your kidneys, but to filter toxins efficiently, kidneys require a large amount of water. If the kidney does not receive enough water, it could lead to health concerns including kidney stones and other kidney-related diseases.

Fortunately, one way the kidneys inform someone of whether they’re providing their body with enough water is by concentrating the amount of water expelled through urine – thus changing the color of urine to bright yellow.