Digestive System Lab Report

By: Victor Gutierrez

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Professor Niloufar Haque

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Digestion is the prosses of a system including organs that work together as a whole and break down food and absorbing many positive benefits it has by the absorber. In this case the human body, which will then be used and the same cycle will be repeated after another food intake occurs. According to "Digestion refers to the breakdown of food into smaller components that can be absorbed into the bloodstream.(Mandal, D)" In other words, food that are absorbed are distributed through the body in other components. **The importance of the digestion system** is that from this process is from were the most essential nutrients or energy comes from. According to, "Digestion is important because your body needs nutrients from food and drink to work properly and stay healthy. Proteins, fats, carbohydrates, vitamins, minerals, and water are nutrients. Your digestive system breaks nutrients into parts small enough for your body to absorb and use for energy, growth, and cell repair. (niddk.nih.gov/)" This means that digestion is necessary, since only throw this process the body can absorb nutrition and be able to use it on its own specific needs.

The **organs** and **function** that allow for the **process** of digestion to occur are as follow; The digestive process starts in your **mouth** when you chew. The salivary glands make saliva, a digestive juice, that hydrates food so that it moves fluently through the esophagus into the stomach. Saliva itself has an enzyme that begins to break down starches in the food. After swallowing, "peristalsis alternating waves of contraction and relaxation that squeezes food along the GI tract (Martini, F)." In other words, a process that pushes the food down throw the **esophagus** into the stomach throw waves as muscles contract and relax allowing food to flow. The glands in the **stomach** lining make acid and enzymes that break down food. The muscles of the stomach mix the food with these juices. The **pancreas** makes digestive juice that have

enzymes that break down carbohydrates, fats, and proteins. The pancreas sends the digestive juice into the small intestine through small tubes name ducts. The **liver** makes a digestive juice called bile, in which helps digest fats and vitamins. The Bile ducts carry bile from liver to the gallbladder for storage, or towards the small intestine to be used. The **gallbladder** stores bile in between meals. When eating, your gallbladder pushes bile through the bile ducts towards the small intestine. The small **intestine** makes digestive juice, which mixes with bile and pancreatic juice to complete the breakdown of proteins, carbohydrates, and fats. Bacteria in your small intestine make the enzymes you need to digest carbohydrates. The small intestine moves water from the bloodstream into the GI tract to help break down food. The small intestine absorbs water with other nutrients as well. In the **large intestine**, more water moves from the GI tract into the bloodstream. Bacteria in the large intestine helps break down nutrients that remain and make vitamin K. Waste products of digestion, such as, parts of food that are still too large, become stool that are hold in the rectum, which will then be released. Within these processes there are **3 major enzymes** involved in digestion that are **lipase**, **amylase** and **pepsin**. **Lipase** is an enzyme the body uses to break down fats in food so they can be absorbed in the **i**ntestines. **Lipase** is produced in the pancreas, mouth, and stomach. **Amylase** enzymes are also made by the pancreas and salivary glands. They help break down carbs so that they are easily absorbed by the body. **Pepsin** is a stomach **e**nzyme that serves to digest proteins found in ingested food.

Some health conditions associated with some common malfunctions of the digestive system are as follow; system Gastroesophageal Reflux Disease (GERD), most often presents as heartburn, but uncontrolled GERD can harm the lining of the esophagus and lead to bleeding. Chronic Constipation is having fewer than three bowel movements a week for three weeks or longer. It may also be the case that stools are hard and difficult to be process. Gastroenteritis can

be caused by an infection as a virus or as bacteria in the gut. Ulcers are most likely caused by either bacterium in the stomach or by using more than normal over the counter anti-inflammatory drugs such naproxen or ibuprofen.

Assessing Pepsin Digestion of Proteins with materials and methods; using specific subsenses to digest protein albumin in egg white. In cubes of egg white are added to 5 different tubs. First tub 2(ml)of water. Tubs 2,3, and 4 2(ml) of pepsin is added. Two drops of hydrochloric acid are additionally added to tubes 2 and 4. 2 ml of amylase added to tube 5. This are incubated for close to 30 minutes. The second tube at room temperature while the other tubes in warm water. Then tubes are shaken to see if egg flakes are seen due to digestion from the solid egg white cube. **Results** are as follow; No digestion in tubes 1 and 5 as water with acid alone does not digest egg white, nor does the enzyme amylase. However, in tubes 3, 2 and 4 show there is some digestion Pepsin is an enzyme that digest egg white. Greatest digestion occurs tube 3 as it has acid added and was incubated at a warmer temperature. Enzyme have optimum temperature and pH that work at their best such as the stomach in the human body.

Assessing Starch Digestion of Salivary Amylase with materials and methods giving specific results; to examine the effects of amylase substrate specificity, six tubes are prepared with different combinations of enzymes, substrates, buffer and water. Amylase, that breaks down starch, was added to tubes 1 to 3. Starch was added to tubes 1 and 5; glucose to tube 2; cellulose to tubes 3, 4 and 6; peptidase, that breaks down peptide, was added to tube 5. Bacteria was added to tube 6. Deionized water was added to tube 4. Buffer with pH 7.0, was added to all tubes. All tubes were incubated at 37° C for 60 minutes. Each incubation tube was tested for the presence of starch using potassium iodide (IKI) and reduction of sugar using Benedicts solution. To test for starch, half of each tube was added to a separate testing tube and one drop of IKI was added.

The Color change of each testing tube was recorded after addition of IKI. To test for reducing sugar six drops of Benedicts's reagent was added to the other half of each mixture. The tubes were then incubated in boiling water. Than the Color change after incubation of each tube was recorded. Tubes 1 and 5 had glucose; tubes 3, 4 and 6 had cellulose; while tube 2 had glucose. Amylase was added to tubes 1 3, peptidase which breaks down peptidase was added to tube 5 as a negative control. Tube 4 had water instead of amylase serving as a negative control. In tube six bacteria were added in order to examine whether these bacteria have enzymes capable of digesting starch. After 60 minutes incubation at 37 C, only tube 5 was positive for starch as indicated by a dark blue color after addition of IKP. For the Benedict's test, tubes 1, 2 and 6 changed to a brown-orange color after boiling, indicating they were positive for reducing sugars, compared to tubes 3 – 5. Benedicts solution is used to test for reducing sugars. Reducing sugars like glucose, have functional groups ketones or aldehydes that can react with copper ions when heated, leading to a change in color. Color varies from yellow to brick red. Test tube 1 gave positive results for reducing sugar, as expected, because the amylase broke down starch to maltose, which is a reducing sugar. Tube 2 was also positive for reducing sugar because glucose, another reducing sugar, was added to the tube. It also shows that amylase did not digest or affected the glucose. This is further confirmation that amylase is specific to starch and not other glucose. This test also served as a positive control for the Benedict's test, since glucose is a reducing sugar. Tubes 3 – 5 were negative for reducing sugars because the substrates cellulose and starch added to them are not reducing sugars. Tube 3 also help confirmed amylase specificity because there was no reducing sugar in the presence of cellulose. Lastly, tube 6 gave a positive reaction, because this bacterium most like possess enzymes capable of breakdown cellulose to reducing sugars like glucose.

Lipid digestion with materials and methods; using substances to see on how they can digest lipid. Four tubes are use. In each tube a lipped cream is added with alkaline pH indicator which is pink alkaline pH indicate. First tube water and bile salt. Tube 2 light past enzyme from pancriana extract. Tube 3 light past enzyme and bile salt. Tube 4 amylase. Then observation over time to see if any color change or if they don't. **Result** are as follow; Tubes 1 and 4 no color change. meaning water and bile salt in tube don't digest lipids nor does amylase in tube 4. In tubes 2 and 3 there is digestion to the fatty acids which change the color, in tube 3 its works at its best due the addition of bile salt.

In discussion the conclusion made is that for **Assessing Pepsin Digestion of Proteins** Greatest digestion occurs tube 3 as it has acid added and was incubated at a warmer temperature. Enzyme have optimum temperature and pH that work at their best as the stomach in the human body. **Assessing Starch Digestion of Salivary Amylase** In these results demonstrated that amylase does not breakdown cellulose, glucose or other carbohydrates, but instead is specific to starch, breaking it down to reducing sugars like maltose. The activity does demonstrate the purpose of the experiment. **Lipid digestion** bile salts emulsify lipids braking large droplets so the smaller droplets so the enzyme can access more lipped molecules as they catalase chemical reactions. Showing Proteins break into amino acids Fats break into fatty acids and glycerol Carbohydrates break into simple sugars similar in how the digestive system works to break down food to be able to absorbed it into the body.

Work cited

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