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Anatomy & Physiology 2

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Lab report: Digestive system

The dIgestive system is a very crucial part in any living thing.it is made up of the gastrointestinal tract. It is the process of breaking down food by mechanical and enzymatic action in the alimentary canal into substances that can be absorbed and used by the body. It is how your body turns foods into nutrients that your body needs to grow, obtain energy and for cell repair.

In order to do this, enzymes play a major role in the body chemically digesting substances consumed by the body. Enzymes serve as a catalyst and initiate certain chemical processes in regards to particular substances while not being altered in the process. Namely, amylase, which is present in saliva, converts starches into sugar, thus helping to initiate digestion. Whereas there is the enzyme pepsin, which is present in gastric juices in the stomach that helps to break down proteins. On the other hand there is also the enzyme lipase that aids in the digestion in fats. Enzymes play a very vital role in the chemical digestion of food and ultimately in the body being able to optimally absorb nutrients from digested food.

There are some health conditions associated with the digestive system. One of those health conditions can be anal fissure. Anal fissure is a small tear in the thin,moist tissue (mucosa) that lines the anus. Its the opening at the end of the digestive tract where stool leaves the body. It may occur when you pass hard or large stools during bowel movement. They usually cause pain and bleeding with bowel movements. Fissures are extremely common in young infants but can affect people of any age. Some symptoms may include pain and bleeding, usually during or shortly after bowel movement. It lasts for several minutes to several hours and stops until the next bowel movement. The diagnosis for this is gently inspecting the anus. The treatment for this would be stool softeners, protective ointments and sitz baths.

The purpose of this lab activity was to examine the effects of digestive enzymes on their specific substances and observe the effects of environmental influences on digestion.

Materials :

1. Tubes,
2. Starch,
3. Amylase,
4. Water,
5. Cellulose,
6. Peptidase,
7. Bacteria,
8. Glucose,
9. Benedict solution,
10. Iodine.

Experiment data shows seven different tubes of reagent of a Ph level of 7.0 buffer which is used to test the enzyme amylase on different substances. Enzymes are proteins that act as catalysts for biological reactions. Enzymes, like all catalysts, speed up reactions without being used up themselves. They do this by lowering the activation energy of a reaction. All biochemical reactions are catalyzed by enzymes. Since enzymes are proteins, they can be denatured in a variety of ways, so they are most active under mild conditions. Most enzymes have optimum activity at a neutral pH and at body temperature.

To test for the specificity of the enzyme amylase, the substrates glucose, cellulose and starch were used. 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 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.

To examine the digestion of protein by pepsin, 5 tubes were prepared with different combinations : Egg cube, Pepsin, HCL, Amylase. Firstly a cube of white part of egg is added to all 5 tubes, 2 ml of water in tube 1, 2 ml of pepsin in tube 2,3 and 4. 2ml of amylase in tube 5,2 ml of HCL in tube 2 and 4, Incubate 30-60 minutes tube 2 at room temperature remaining in warm water.

To examine the digestion of starch by salivary amylase, 4 tubes were prepared with different composition : Water, Amylase, Pepsin, Starch solution. Firstly 2ml of starch solution was added in tube 1,2,3,4. After 20 drops of water, 20 drops of amylase, 20 drops of boiled amylase, 20 drops of pepsin were added in tube 1,2,3,4 respectively. Then we put them in warm water and incubated for some time.

To examine the digestion of fat by lipase, 4 tubes were prepared with different composition L lipid cream, water, bile salt, lipase, amylase. Lipid cream was added in tube 1,2,3,4. Water and bile salt was added in the tube. Lipase was added in tube 2, Lipase and bile salt was added in tube 3, Amylase was added in tube 4. After we observed color changing.

In conclusion the digestive system plays a major role in the body. It helps break down food into nutrients which produces energy and helps the body grow. You need the digestive system in order to function.

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