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Bio 2312 OL57

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Chemical Breakdown of Foodstuff (lab 9)

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## **Introduction**

When people think about how food is broken down, they normally associate it to digestion when there is much more that goes into the process and breaking down food in our body. The human body is made of many components that help us function daily but, in this case, the important component is enzymes. To many who are not aware of how digestion occurs enzymes are nothing however they play a major role in the human body when it comes to food digestion. Digestive enzymes are enzymes in the human body which are used to break down food into smaller molecules so that the body can use them to make energy. Without the enzymes in our body, we wouldn't be able to function because the food we eat would just sit in our intestines and never be digested.

In activity 1 in this experiment the enzyme being tested is amylase to see the presence of starch. Salivary amylase is an enzyme produced by the salivary glands of our body. The salivary gland is the part of our body that make saliva the saliva is then used to help us swallow for digestion to start in our body. The salivary amylase which comes from the salivary gland is an enzyme that's helps humans digest starch into small molecules which then become small glucose molecules in our body which are used to generate energy, (Evan Frisbee). With glucose molecules we can have energy and move around during the day. For example, let's say someone is sleeping and they wake up after an 8 hour sleep their body will instantly crave food after more than 8 hours without eating and their first choice of food would probably be something that contains glucose like bread or cereal. This is because not only is this a quick fix meal but its also good for us when taken with precaution. Glucose must be consumed with precaution because when starch decreases sugar in

the body increases and too much sugar can lead to diabetes. In this activity we were testing the presence of starch by doing an iodine test. We used the iodine test because when iodine is mixed with starch the color changes.

In activity 2 we were testing to see for the color change from clear to yellow to show presence of proteins by trypsin. Trypsin is an enzyme in our body that helps us digest protein. Once trypsin breakdown breaks down proteins it becomes amino acids. These amino acids are essential for our bodies to grow and reproduce cells. This explains why most gym protein shakes contain amino acids because it is needed for muscle growth and strength, (Scoot Frothingham).

In activity 3 we are looking at fat digestion by lipase. Lipase is the enzyme that digests the fats in the human body. Lipase is essential to the body because it maintains the gallbladder functioning properly, (Sabrina Felson). In order to see if lipase was present, we used litmus to see if the solution changed from color in this case from blue to pink showed the pH changed.

The purpose of these lab activities was to examine the effect of digestive enzymes in the human body. Lipase was used to detect lipids; amylase was used to detect starch and trypsin to detect proteins.

### **Material and methods**

To test for amylase, 6 tubes, a wax pencil, boiling water, pipet, starch, iodine, and boiling water were used to complete the experiment.

To test for trypsin, 5 test tubes, test tube rack, a dropper bottle of trypsin and dropper bottle of BAPNA were used in this experiment.

To test for lipase, 9 test tubes, test tube rack , bile salt, and a dropper bottle of pancreatin litmus cream and water were used in this experiment.

### Salivary Amylase Digestion of Starch

Tube	1A	2A	3A	4A	5A	6A
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Additives	Amylase, water	Starch, water	Maltose, water	Amylase – boiled than starch added	Amylase, starch	Amylase, starch
Incubation Condition	37 degrees Celsius	37 degrees Celsius	37 degrees Celsius	37 degrees Celsius	37 degrees Celsius	0 degrees Celsius
IKI Test (color change)	no color change	Color (blue black)	no color	Color (blue black)	No color	color
Result (+) or (-)	negative	positive	negative	Positive	negative	positive
Benedict's Test (color change)	no color	no color	color	No color	color	No Color
Result (+) or (-)	negative	negative	Positive	Negative	Positive	negative

### Trypsin Digestion of Proteins

Tube	1T	2T	3T	4T	5T
additive	Trypsin , water	BAPNA, water	Trypsin – boiled trypsin, BAPNA	trypsin BAPNA	Trypsin BAPNA
incubation condition	37 degrees Celsius	37 degrees Celsius	37 degrees Celsius	37 degrees Celsius	zero degrees Celsius
color change	no color change	no color change	no color change	color change	no color change
Result (+) or (-)	-	-	-	+	-

### Pancreatic Lipase Digestion of Fats

Tube no.	1L	2L	3L	4L	5L	4B	5B
additives	Pancreatin, water	Litmus cream, water	Pancreatin -boiled pancreatin , litmus cream	Pancreatin, litmus cream	Pancreatin, litmus cream	Pancreatin, litmus cream, bile salts	Pancreatin, litmus cream, bile salts.
incubation condition	37 degrees Celsius	37 degrees	37 degrees Celsius	37 degrees Celsius	zero degrees Celsius	37 degrees Celsius	zero degrees Celsius

		Celsius					
color change	No	No	No	Yes	No	Yes	No
Result (+) or (-)	-	-	-	+	-	+	-

The amylase digestion test shows that when starch mixed with water as well as with amylase and then boiled it passed the iodine test and changed to blue black. This shows that starch was still present when mixed with water and when mixed with amylase and then boiled. This shows that starch is only present when mixed with substances that don't cause it to break down when at the correct temperature. However, in tube 5A there was no color change meaning that even though starch was mixed with amylase it broke down while when mixed with amylase and boiled it was still present and passed the iodine test.

The trypsin digestion test shows that protein is present only when mixed with BAPNA at 37 degrees Celsius however when mixed with water or there was no color change as well as when mixed with BAPNA at 0 degrees Celsius showing that the trypsin protein was no longer present. This shows that when is at 37 degrees and mixed with BAPNA a color change will always occur if it's not boiled.

The pancreatic lipase digestion of fat shows color change at 37 degrees calcium when pancreatin was mixed with litmus cream. When pancreatin litmus cream and boiled no color change occurred showing that the test tube didn't become acidic because if it did there would be a color change.

## **List of reference**

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