Mariah Hall

Bio 125- Tuesday Lab

9/6/2023

Laboratory 3 Report -Properties of Enzyme Action

Purpose: The purpose of lab 3 is to learn about enzymes. We learn that enzymes act as catalysts due to their complex molecular configuration that provide temporary binding sites for specific substrate molecules. Enzymes are complex proteins that start and speed up specific chemical reactions with being changed or used up.

Procedures:

3-C Digestion of fat with pancreatic lipase and bile salts

1. Add just enough litmus powder to a container of dairy cream to produce a medium blue color. Pour 3 ml of the litmus cream into 4 separate test tubes. Into two additional test tubes pour 3 ml of 2% pancreatin. Preincubate the litmus cream and the pancreatin separately in a 37°C water bath for 5 minutes. Then prepare four test tubes as follows.

   Tube #1: 3 ml cream + 3 ml pancreatin

   Tube #2: 3 ml cream + 3 ml distilled water

   Tube #3: 3 ml cream + 3 ml pancreatin +pinch of bile salts

   Tube #4: 3 ml cream + 3 ml distilled water + pinch bile salts

2. Gently shake each tube for 30 seconds to mix in the bile salts. Incubate all four tubes in a 37°C water bath for 1 hour, checking every minute for the first 5 minutes or until the first tube changes color, then every 15 minutes for the rest of the hour. Record the time and number of the tube. Continue checking for the remainder of the hour.3. Remove the tubes from the water bath. Test the pH of each tube using pH paper and note the odor and color of each tube.

3. Remove the tubes from the water bath. Test the pH of each tube using pH paper and note the odor and color of each tube. NOTE: Blue litmus will turn pink in an acid environment

Results:

Tube	Color	pH	Odor	Time to change color
#1	Pink	5	Spoiled milk	20 mins
#2	Blue	6	No odor	35 mins
#3	Lavander	3	Swiss cheese	35 mins
#4	Periwinkle	6	No odor	35 mins

The digestion of fats lowers the pH because when fats digest, they break down into fatty acids.

Bile increases the rate of digestion because it emulsifies fatty acids and lipids into smaller droplets increasing their surface area which allows digestive enzymes to act quicker.

Discussion:

This lab was fun, it was interesting to see the color changes that occurred after so many minutes had passed by and to see the separation of the different substances. When it came to observing the smell, after smelling the very first test tube of the experiment being so smelly, I hesitated to smell the others. Overall, I really enjoyed it and was surprised that not all test tubes had an odor, I figured anything with a milk product warmed would have an odor. I was expecting the test tubes with the bile salts to have a faster change in color but based on our results that wasn't the case.

Conclusion:

-Enzymes act as catalyst to bring out specific reactions.

-Enzymes denature.

-Denaturing is caused by extreme changes in temperature and pH.

-Lipase alone, can't act on a large lipid.

-Bile salts act as emulsifying agents, which help break down fats smaller.