PROPERTIES OF ENZYME ACTION- Digestion of fat with pancreatic lipase and bile salts

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Purpose

The purpose of this lab was to see some aspects of the action of pancreatic lipase and bile salts on lipids. This is because pancreatic lipase has a major role in fat digestion. Bile salts help overcome the problem of it being a water-soluble enzyme.

Procedures

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. Preincubatethe 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 pancreatinTube #2: 3 ml cream + 3 ml distilled waterTube #3: 3 ml cream + 3 ml pancreatin +pinch of bile saltsTube #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, checkingeveryminuteforthefirst5minutesoruntilthe 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. NOTE: Blue litmus will turn pink in an acid environment.

4. Summarize the results in a table.
5. Explain how the digestion of fat affects the pH of the solution and how bile affects the rate of digestion

Results

Tube	Color	pH	Odor	Time it changed color
1	Light purple	6	Cheesy	35 mins
2	Dark purple	9	Milky	50 mins
3	Magenta	6	Throw up	15 mins
4	Dark blue	8	Worse than throw up	20 mins

Discussion

We were scared we messed up this lab. We didn't really understand what was going on at the moment. Then we realized with our results what it meant that the bile salts helped the water-soluble enzyme.

Conclusion

In the two tubes that had the bile salts, it took less time to change colors, change pH, and change odor. This is because the bile salts act as an emulsifier agent that breaks fat into smaller droplets so that lipase has a larger surface area for its hydrolysis of fats. This was shown in the two tubes that reacted faster because it had the bile salts.