**The Amylase Lab Report**

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**4/25/14**

**Abstract**

When some people eat dairy products they experience digestive discomforts. The reason for these discomforts is because the individuals do not produce enough of an enzyme called lactase. The purpose of this experiment is to test if Lactaid really digest lactose/glucose. For this experiment I will determine if Lactaid really works to break down milk sugar. Our conclusion came out positive.

**Background**

The enzyme Lactase contains lactase enzymes that digest lactose, a carbohydrate found in milk. Lactase is a protein enzyme that digests lactose into glucose and galactose. Enzymes are protein catalysts that speed up the rate of reaction between substances without themselves being consumed in the reaction. Right now there is a dietary supplement called LACTAID that contains the enzyme lactase. The makers of LACTAID claim that the lactase in this product will allow people with lactose intolerance to enjoy eating dairy products. The product claims, “Works naturally to break down milk sugar, so you can enjoy the dairy foods you love”

A Catalyst relates to an enzyme by helping in the digestion process. It also accelerates a chemical reaction without itself being affected. The difference between a monomer and a polymer are that monomers are consisted of one molecule where a polymer is a bunch of molecules put together. LACTAID is a polymer. Amylase works in the body during digestion by specifically breaking down carbohydrates. There are different enzymes in the body that digest different things for example lactase breaks down lactose and amylase breaks down carbohydrates. The goal for this experiment is to test if Lactaid really digest lactose and if changes in pH and temperature impact an enzymes rate of reaction.

**Hypothesis**

Our question for this experiment was does Lactaid really digest lactose? I am conducting an experiment to determine if Lactaid really works to break down lactose. My hypothesis is if lactose is present then LACTAID will break it down and make it able to be digested. The independent variable for this experiment is how many drops of each liquid we put on the pH paper. The dependent variable is how well you dissolve the tablet in the experiment.

**Materials and Methods**

Materials:

* Test tubes or capsules with lids
* Beakers (50 mL, 100mL, 250mL)
* 10 mL graduated cylinders
* Glucose
* Powdered milk
* Deionized water
* Lactaid tablets
* Hot plates
* Stirring rods
* Vinegars
* Glucose test strips

Procedure:

1. Place Lactaid tablet into the large capsule labeled LACTAID
2. Add enough tap water to fill the 3 large tubes (Labeled LACTAID, Glucose, and Powdered Milk) approximately one half full. Cap and shake each of the tubes vigorously for three minutes to dissolve the materials in the tubes.
3. Fill the small tube labeled water with tap water
4. Take out 5 glucose test strips from the bottle “ pH strips”
* See Bottle for range of results for presence of glucose
* Teal/ Aqua= negative for glucose
* Brown= Brown glucose present

**Results**

The results for this experiment were what color the glucose test strip was after dropping the assigned number of drops of each liquid on it.

|  |  |  |
| --- | --- | --- |
| Test Strip | Observations | Conclusion (Is glucose present) |
| 4 drops of water | Blue and green | No |
| 4 drops of glucose | Brown | Yes |
| 4 drops of milk | Blue/green | No |
| 4 drops of LACTAID | Brown/blue/green | Yes |
| 2 drops of milk and 2 drops of lactaid | Brown/blue | Yes |

**Discussion**

The results of this experiment were that Lactaid does break down glucose/ lactase. LACTAID enzymes contain lactase which breaks down the lactose into simple sugars like glucose. This explains why the 2 drops of milk and 2 drops of LACTAID had glucose present. Based on the results this experiment proves that the background research was in fact true. Some errors in this experiment that could have happened were our interpretation of the color of the glucose test strip after the liquid was placed on it. Some ways we could have improved the experiment were to do more trials, and had a variety of drops of each liquid. Some future experiments that could expand our research are the experiments of LACTAID working in a person’s stomach and if LACTAID would work on hot chocolate.

**Conclusion**

The LACTAID did digest and breakdown lactose/ glucose therefore my hypothesis was correct.

**Citations**

* "LACTAID® Lactose-Free Dairy Products - LACTAID®." *Www.lactaid.com*. N.p., n.d. Web. 28 Apr. 2014. <http://www.lactaid.com/>.
* "National Digestive Diseases Information Clearinghouse (NDDIC)." *Lactose Intolerance*. N.p., n.d. Web. 28 Apr. 2014. <http://digestive.niddk.nih.gov/ddiseases/pubs/lactoseintolerance/>.
* Brain, Marshall. "How Cells Work." *HowStuffWorks*. HowStuffWorks.com, 01 Apr. 2000. Web. 28 Apr. 2014. <http://science.howstuffworks.com/life/cellular-microscopic/cell2.htm>.