Name_____ Date_____Period____

Got Milk Curds?

Purpose: The purpose of this lab is to determine what percentage of nonfat milk are protein, carbohydrate, and water. To do this, the protein in milk will be *denatured* with concentrated acetic acid. The acid, simulating stomach acid, will change the protein from a complicated globular structure to simple straight chains that will allow your body's enzymes to break it apart more easily in your intestines. This is the main purpose of the acid in your stomach; it does not actually digest food.

Safety:

Procedure:

Part 1 – Separate protein from milk

1. Find mass of 50 mL beaker.
2. Fill beaker with about 10 mL nonfat milk. Take mass.
3. Add about 20 drops concentrated acetic acid to beaker. Swirl gently and let sit for several minutes. Record observations.
4. Record mass of filter paper and fold into quarters. Write name on it in pencil
5. Pour mixture into filter paper as shown in class. Rinse gently and well several times with distilled water to remove acid and carbohydrates from curds. Leave to drain and dry overnight.
   Rinsing is a critical step- over-rinsing is impossible!!!
6. Clean and dry beaker, clean lab station.
7. Record mass of dry filter paper and dried milk protein next day.

Part 2 – Determine percentage of milk that is water –Collect data from demonstration – done by teacher.

1. Record mass of clean watch glass.
2. Record mass of milk added to watch glass.
3. Record mass of dried milk and watch glass after it has been heated.

Data Tables

Curd data

Mass of 50 mL beaker (g)	
Mass of beaker + milk (g)	
Mass of milk only (g)	
Mass of filter paper (g)	
Mass of filter paper + protein (g)	
Mass of protein only (g)	

Watch glass data – Provided by teacher

Mass of watch glass (g)	
Mass of watch glass + milk (g)	
Mass of watch glass + dried milk (g)	
Mass of water in milk (g)	

After data collection:
use directions on back of lab to complete a separate CER purple lab sheet with your lab partner ☺

Question: What percentage of nonfat milk is carbohydrate, protein, and water?

Claim: Nonfat milk is ____% carbohydrate, ____% protein, and ____% water.

Evidence: *include units on every number! ☺

1) Write formula for determining percentage of milk that is protein.

2) Showing all work, determine the percentage of milk that is protein.

3) Write formula and steps for determining the percentage of milk that is water.

4) Showing all work, determine the percentage of milk that is water.

5) Assuming milk is only water, protein, and carbohydrate, determine the percentage of milk that is carbohydrate.

6) How do your results compare to the average values given in your lab (#4). Be specific for each result.

Procedure Questions

What would the consequence of each of the following be on your lab results (higher or lower values?) Be specific.:

1) Don't rinse curds enough.
2) Wash small beaker w/ curd residue.
3) Forget to weigh filter paper.
4) Rinse curds through funnel.
5) Don't dry curds completely.
6) Don't react milk completely with acetic acid.

Summary Questions

1) Which monomers make up the carbohydrates in milk?
2) Which monomers make up the proteins in milk?
3) What are the functions of proteins and carbohydrates in your body?
4) What do you think is the largest source for error in this lab? How would you improve it?
5) How confident are you and your partner about your results? Why?