

Making Cheese

Introduction

Cheese is the solid portion of milk that has been separated by using an enzyme known as rennet. This solid portion is called the curd, while the liquid portion that is removed is called the whey. Fortunately, rennet is now produced commercially; it used to be extracted from the fourth stomach of a suckling calf.



There are three basic steps to preparing cheese from milk: generating lactic acid, curdling, and aging (or curing). In this lab, you will make cheese from milk that has been soured with a “starter” of buttermilk, which contains bacteria. The bacteria turn the lactose, or milk sugar, into lactic acid. Once the milk is acidic enough, adding the rennet and gently heating the mixture will cause coagulation to occur in a short amount of time. After the reaction has completed, we can enjoy our brand new cheese!

Materials

buttermilk	rennet
filter paper	table salt
milk	

Equipment

food-safe beaker, 400-mL	food-safe thermometer
food-safe funnel	hotplate
food-safe stirring rod	

Safety Considerations

- Make sure that only “food-safe” equipment is used on the milk/cheese mixture.
- Wash your hands thoroughly after completing this lab.

Procedure

1. Place 200 mL of slightly soured milk in a 400-mL food-safe beaker. Note its color, odor and any other features and record these in the Data Table.
2. Using a hotplate, warm the milk gently to around 31°C. Be careful not to overheat!
3. While stirring the milk with the stirring rod, add ½ of a rennet tablet to the milk. Break up the tablet with a stirring rod so that it dissolves faster.
4. Gradually increase the temperature of the milk to 38°C, but not any higher! Overheating the rennet can cause the enzyme molecules to break down and stop coagulating.
5. Carefully remove the beaker from the hotplate using your hands; it should be warm but not hot. Don’t forget to turn off the hotplate!
6. Allow the hot milk to sit undisturbed for at least 15 minutes. **DO NOT STIR THE MILK DURING THIS TIME.**
7. Filter the contents of the beaker using a funnel and filter paper. This solid product is your cheese!
8. Place your cheese between some paper towels and press it to remove as much liquid whey as possible. Note the color, odor, texture and any other features of your cheese and record these in the Data Table.
9. Enjoy your cheese with some crackers! You may want to salt it first to help enhance its flavor, which is very mild.

Clean-up

1. Dispose of the used filter paper and any leftover cheese in the trash, NOT THE SINK.
2. Clean the beaker, funnel and stirring rod thoroughly with soap and water you're your hands - DO NOT USE A TEST TUBE BRUSH.
3. Return all equipment to its proper location.
4. Wipe down your lab area and wash your hands before leaving the lab.

Data Table

Procedure	Observations
before heating	
after filtering	

Questions

1. How does your cheese differ from commercially prepared cheese in both appearance and taste?

2. How do you think the flavor of our cheese is affected by the amount of fat in the milk we used?

3. What are two possible reasons that you think commercial cheddar cheese is a vivid orange color while the cheese we made in this lab is not?

4. Next quarter, we will complete a lab where we use milk to make white glue, similar to Elmer's (which features a bull in its logo). Instead of using rennet to coagulate the milk, we will use vinegar. Why do you think we can't use vinegar to make cheese?

5. List one way you could change this lab and describe how your results might be different.
