

# Cheese Making Laboratory

## Materials required

Distilled white vinegar (acetic acid), 5% acidity	Beakers
Pasteurized whole milk	Graduated cylinder
Rennet tablets (Junker)	Balance
Cheesecloth	Thermometer
Rubber bands	Foil
Stirring rod/wood Popsicle sticks	Pestle
Weigh boats	Eyedroppers

## Experimental procedure

### Part 1. Precipitation of casein from milk with an acid (vinegar)

1. Weigh the empty beaker and record the weight. Weigh and record the weight of 120 milliliters (1/2 cup) of milk at **21°C (70°F)** in the beaker. Record the weight of the milk in the data table (weight of beaker with milk - weight of beaker = weight of milk).
2. Add 11 milliliters (2 teaspoons) of vinegar to the warm milk and slowly stir for 2 minutes, then allow the milk to sit for 5 minutes. The casein will precipitate into heavy white curds.
3. Cut out a piece (2-3 layers) of cheesecloth large enough to cover the top and 2 inches down the sides of a beaker. Using the rubber band, fasten the cheesecloth over the top of the beaker. Pour the curdled milk into the beaker, collecting the curds (casein) in the cheesecloth and allowing the vinegar and whey to drain off into the bottom of the beaker.
4. Gather up the cheesecloth with the casein and squeeze the casein until almost dry and then spread out the cheesecloth to let the casein dry for 5 minutes.
5. Weigh the precipitate together with the cheesecloth, subtracting 3 g (the weight of the cheesecloth) of the total weight and record your results.

### Part 2. Enzymatic coagulation of casein from milk with rennet

1. Place 1/2 of a crushed rennet tablet into a beaker. To crush the tablet, place it between two pieces of foil and hit the tablet with a pestle.
2. Weigh the empty beaker and record the weight. Weigh and record the weight of 120 milliliters (1/2 cup) of milk at **43°C (110°F)** in the beaker. Record the weight of the milk in the data table (weight of beaker with milk - weight of beaker = weight of milk).
3. Pour the hot milk over the rennet tablet, stir slowly for 2 minutes, and allow the milk to sit on the lab bench for 5 minutes.
4. Cut out a piece (2-3 layers) of cheesecloth large enough to cover the top and 2 inches down the sides of a beaker. Using the rubber band, fasten the cheesecloth over the top of the beaker. Pour the curdled milk into the beaker, collecting the curds (casein) in the cheesecloth and allowing the whey to drain off into the bottom of the beaker.
5. Gather up the cheesecloth with the casein and squeeze the casein until almost dry and then spread out the cheesecloth to let the casein dry for 5 minutes.
6. Weigh the precipitate together with the cheesecloth, subtracting 3 g (the weight of the cheesecloth) of the total weight and record your results.

#### Calculation Table – Milk

	Weight of beaker with milk	-	Weight of beaker	=	Weight of milk
Part 1 - Milk + vinegar	<input type="text"/>	-	<input type="text"/>	=	<input type="text"/>
Part 2 - Milk + rennet	<input type="text"/>	-	<input type="text"/>	=	<input type="text"/>

#### Calculation Table – Curds

	Weight of boat with curd	-	Weight of boat	=	Weight of curd
Part 1 - Milk + vinegar	<input type="text"/>	-	<input type="text"/>	=	<input type="text"/>
Part 2 - Milk + rennet	<input type="text"/>	-	<input type="text"/>	=	<input type="text"/>

#### Data Table – Milk curds

	Weight of milk	Weight of curd	Curd color/texture
Part 1 - Milk + vinegar	<input type="text"/>	<input type="text"/>	
Part 2 - Milk + rennet	<input type="text"/>	<input type="text"/>	