

ACTIVITY SHEET II: WHAT CAUSES MILK TO CHANGE TO CURD?

What you will need:



Curd



Four transparent bowls/ beakers
of the same volume



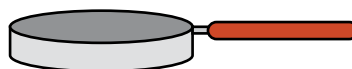
Milk



Plastic measuring
cylinder



Lemon juice



A small saucepan

What to do:

1. Prepare the materials:
 - a) Your teacher will boil the milk and allow it to cool. Gently touch the outside of the container. When it feels warm but not hot, dip a clean finger briefly into the milk. The milk should feel warm, not hot enough to make you pull your finger out quickly. If you have a thermometer, measure and record the temperature. Milk at about 40–45°C is warm enough to make curd.
 - b) Boil a small amount of curd in a saucepan (ask your teacher for help). Let it cool completely to room temperature.
2. Set up the experiment: Use the measuring cylinder to pour the same amount of milk into each of the four bowls. Label them Bowl 1, Bowl 2, Bowl 3, and Bowl 4:
 - a) Bowl 1: Milk only
 - b) Bowl 2: Milk + 2–3 drops of lemon juice



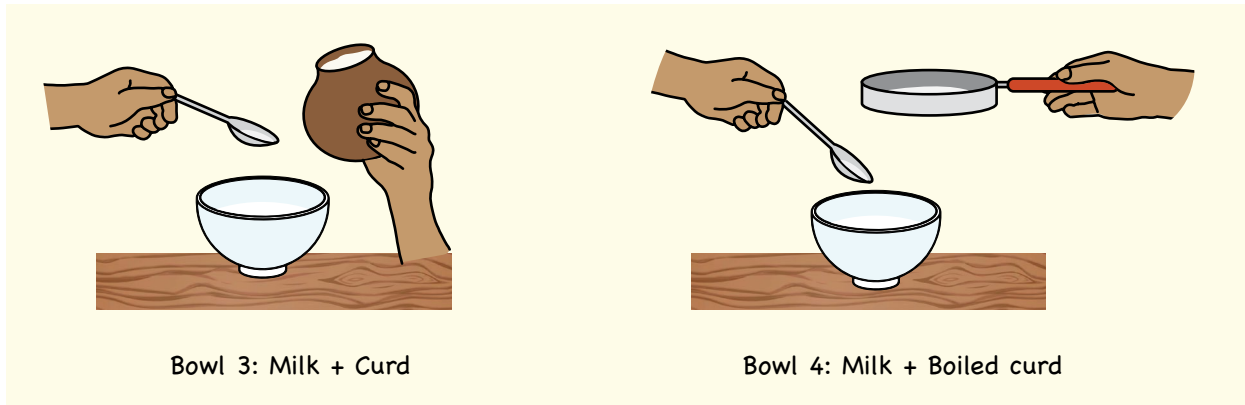
Bowl 1: Milk



Bowl 2: Milk + Lemon juice







- c) Bowl 3: Milk + one teaspoon of curd (use a fresh spoon)
- d) Bowl 4: Milk + one teaspoon of boiled curd (use a fresh spoon)



3. Mix and wait: Use separate spoons to mix the contents of each bowl gently. Place all four bowls together in a warm place. Do not disturb them.

Observe and record:



Observe the bowls: (a) Immediately, (b) After 4 hours, and (c) After 6 hours. Record your observations in the table below.

 Bowl No.	 Bowl contents	 Time	Did you get curd? Y / N	 Any other observations?
1	Milk	Immediately		
		4 h		
		6 h		
2	Milk + lemon juice	Immediately		
		4 h		
		6 h		
3	Milk + a teaspoon of curd	Immediately		
		4 h		
		6 h		
4	Milk + a teaspoon of boiled curd	Immediately		
		4 h		
		6 h		

Think about and discuss:

- Does warm milk change into curd when left to itself? Why or why not?
- What happens to milk when lemon juice is added? How quickly does this change happen? Why does this milk not turn into curd?

- Why does adding a little old curd change milk into fresh curd? What does old curd contain that causes this change? How long does this process take?
- What happens when boiled curd is added to milk? Why does this bowl behave differently from Bowl 3?
- You caused milk to change in three ways: by adding lemon juice, old curd, and boiled curd.
 - (a) Which of these changes is reversible? Why?
 - (b) Which change took the longest time? Why?
- Why is it important to use fresh spoons for Bowls 3 and 4? What do you think would happen if the same spoon was used first for:
 - (a) Old curd and then for boiled curd?
 - (b) Boiled curd and then for old curd?
- Have you seen milk spoil at home? How does spoiled milk look and smell? What do you think causes milk to spoil? How is spoiled milk different from curd?
- Some people believe that adding the substances in Column 1 of the table below to milk can make it turn into curd.
 - (a) Can you predict which of these is true? Share reasons to justify your predictions.
 - (b) How would you test your predictions?
 - (c) Do your predictions match your observations? Why?

Additions to milk	Predict: Will curd form?	Test: Did curd form?
Whole red chilli with its separated stalk 		
Whole green chilli with its separated stalk 		
Silver coin 