

HOMESCHOOL SCIENCE

MAKING HOMEMADE YOGURT

AND OBSERVING BACTERIAL FERMENTATION



Purpose: To make yogurt using beneficial bacteria and observe how bacterial fermentation changes milk into yogurt.



BACKGROUND

Yogurt is made when beneficial bacteria (mainly *Lactobacillus bulgaricus* and *Streptococcus thermophilus*) ferment the sugar (lactose) in milk. During fermentation, the bacteria produce lactic acid. The lactic acid thickens the milk, gives yogurt its tangy flavor, and helps preserve it.



MATERIALS

- 4 cups (1 quart) whole milk
- 2–3 tablespoons plain yogurt with “live and active cultures” (not Greek style)
- Saucepan
- Thermometer (optional but helpful)
- Stirring spoon
- Clean glass jar or heat-safe container with lid
- Towels or blanket (for insulation)
- Refrigerator



SAFETY NOTES

- Use clean hands and clean equipment.
- Do not use metal containers for storing yogurt during incubation.
- Be careful when heating milk—do not boil over.



PROCEDURE

1. **Heat the Milk:** Pour milk into a saucepan. Heat over medium heat, stirring occasionally, until it reaches about 180°F (82°C) or until small bubbles form around the edges. Do not boil. This helps kill unwanted bacteria and denatures proteins to improve texture.
2. **Cool the Milk:** Remove from heat and let the milk cool to 110°F (43°C). It should feel warm, not hot, to the touch.
3. **Add the Starter:** Stir 2–3 tablespoons of plain yogurt into the warm milk until well combined.
4. **Incubate:** Pour the mixture into a clean glass jar or container and cover with a lid. Wrap with a towel or blanket to keep warm. Keep at a warm temperature (100–115°F or 38–46°C) for 6–12 hours.
5. **Check and Chill:** Yogurt is ready when thickened and tangy to taste. Place in the refrigerator for at least 2 hours to stop fermentation and thicken further.



CONCLUSION

In a few sentences, explain what you learned about bacterial fermentation by making your own yogurt.



OBSERVATIONS

Observe the changes in the milk mixture over time.
Record your observations.

Time Elapsed	What I See (appearance)	What I Smell	What I Notice (texture/taste)
Start (After adding starter)			
2 hours			
4 hours			
6 hours			
8 hours			
10–12 hours (End)			



THINK & EXPLAIN

1. What changes did you observe in the milk as time went on?

2. How do you think the bacteria caused these changes?

3. Why is it important to keep the mixture warm during incubation?

4. What evidence shows that fermentation took place?

5. How does refrigeration affect the bacteria and the yogurt?



EXTENSION IDEAS

- Try making yogurt with different types of milk (2%, lactose-free, or goat milk).
- Use a portion of your homemade yogurt as a starter for your next batch.
- Research other foods made by bacterial fermentation.