



Testing the Effect of Temperature on Yeast Fermentation



QUESTION

How does temperature affect the rate of yeast fermentation?

BACKGROUND

Yeast is a living organism that eats sugar and produces carbon dioxide (CO₂) gas. The gas can be seen as bubbles or measured by how much it inflates a balloon. Temperature can change how fast yeast works. In this experiment, you will test yeast fermentation at different temperatures.

MATERIALS

- Active dry yeast
- Sugar
- Warm water
- 4 plastic bottles (500 mL size)
- 4 balloons
- Thermometer
- Measuring cup
- Tablespoon
- Large bowl (for warm water bath)
- Ice and a bowl (for cold water bath)
- Timer
- Masking tape and marker



EXPERIMENT SETUP

1. Label 4 bottles: COLD, COOL, WARM, HOT.
2. Add the same amount of warm water to each bottle.
3. Add the same amount of sugar to each bottle.
4. Add the same amount of yeast to each bottle.
5. Place a balloon on the mouth of each bottle (do not blow up the balloons).
6. Set each bottle in a different temperature environment:
 - COLD: Place in ice water bath (0–10 °C)
 - COOL: Room temperature (18–22 °C)
 - WARM: Warm water bath (35–40 °C)
 - HOT: Hot water bath (50–55 °C)
7. Start the timer and observe for 30 minutes.

DATA TABLE – Balloon Circumference (cm)

TIME (minutes)	COLD (0–10 °C)	COOL (18–22 °C)	WARM (35–40 °C)	HOT (50–55 °C)
0 (start)				
10				
20				
30				

Measure the circumference of each balloon (at its widest point) in centimeters.

ANALYSIS QUESTIONS

1. At which temperature did the yeast ferment the fastest?
Why do you think so? _____
2. At which temperature did the yeast ferment the slowest?
Why do you think so? _____
3. What happens if the temperature is too low? _____
4. What happens if the temperature is too high? _____

CONCLUSION

Write a conclusion that answers the question using evidence from your data.



TIP: Keep all other variables the same—same amount of yeast, sugar, and water—so temperature is the only thing that affects the results.