

YEAST LAB

Earlier in the lesson, we got to experience anaerobic respiration occurring among humans, but anaerobic respiration can also occur in other organisms such as bacteria and fungi. Today, we are going to watch the single-celled microorganism fungi, yeast, undergo anaerobic respiration. As you are doing the experiment, consider what elements are needed or lacking. Humans are not the only organisms that can undergo anaerobic respiration.

Purpose

To witness and identify the reactants and products of anaerobic respiration in microorganisms.

Materials List

- 4 plastic/glass soda bottles (16 oz. or smaller)/4 flasks
- Funnel
- 4 packets/9 teaspoons of yeast (available in the grocery store)
- 6 teaspoons of sugar
- 1 cup of warm water
- 4 small balloons

Procedure

1. Label the four bottles: no sugar; 1 teaspoon of sugar; 2 teaspoons of sugar; and 3 teaspoons of sugar.
2. Add one packet of yeast or 2.25 teaspoons to each. Bottle in all four bottles.
3. In the second bottle, add 1 teaspoon of sugar; in the third bottle, add 2 teaspoons of sugar; and in the fourth, 3 teaspoons of sugar.
4. Fill each bottle/flask up with 1 cup of WARM water.
5. Cover the top of each bottles/flasks and gently swirl to mix the ingredients.
6. Stretch out the balloons by slightly blowing in them. Place one balloon over their respective bottle/flask.
7. Let the bottles sit for about 24 hours.

<https://docs.google.com/document/d/1XpaPFGjnfHLFvrJ41fX7wBV9tzz13Dle/edit>

Respiration in Yeast

Record your observations in the data table below.

Container	Reactants	Products	Initial Balloon Length	Final Balloon Length	Difference between Initial and Final Readings
1					
2					
3					
4					

Analysis Questions

1. What is your claim?
2. What do you notice about the temperatures of the four containers? (The temperature rose as you increased the sugar)
3. What was the purpose of container 1? (Control group: it should remain the same the entire experiment.)
4. Why do you think we used warm water? (When it is cold and dry, the yeast are "resting.")
5. What gas was released as a result of this process? (Carbon Dioxide (CO₂))
6. Was this process aerobic or anaerobic? How do you know? (Anaerobic, no oxygen involved)
7. Ultimately, what are we trying to produce at the end of respiration? Whether aerobic or anaerobic, where did it come from and how was it released? (Energy (ATP), sugar, as heat)
8. Predict what you believe would happen if we had given the yeast 5 teaspoon of sugar? In 2-3 sentences, explain what would make it different from the 1 teaspoon, using your knowledge about the reactants and products of respiration. (The container will be five times bigger than container 2. The more input of sugar, the more expected output of CO₂ and energy.)