

Yeast Balloon

Yeasts are tiny living organisms. Just like humans, yeasts get energy from digesting sugar. The chemical reaction of oxygen and food to create energy is known as metabolism. In this experiment, yeasts are eating sugar that is reacting with the oxygen in the air. As a result of this chemical metabolic process, the yeasts release carbon dioxide (CO₂) gas. These CO₂ gas molecules then rise, inflating the balloons.

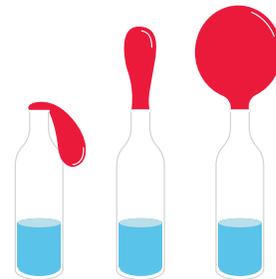
The main types of sugar are Glucose, Fructose, Sucrose, and Lactose. Just as you have a favorite food, yeasts have a preferred type of sugar. Since yeasts can't taste, they define their favorite sugar by how easy it is to break down the sugar. You can discover yeast's favorite sugars by observing how much each balloon expands with gas. The largest balloon is a result of more sugar consumption and more CO₂ bubbles.

Materials needed:

- 3 different types of sugars: Granulated sugar (sucrose), corn syrup (glucose), milk (lactose), or honey (fructose)
- 4 narrow-mouthed jars or bottles
- Warm water
- Active dry yeast
- 4 balloons

Step-by-step instructions:

1. Put 2 teaspoons of one type of sugar into one of the jars or bottles. Repeat with the other types of sugar, labeling each jar or bottle with the type of sugar inside it.
2. Leave one bottle without sugar as an experimental control.
3. Add 3 tablespoons of warm water (~120°F) to each bottle.
4. Add 2 teaspoons of yeast to each bottle.
5. Secure a balloon over the top of each bottle and swirl gently.
6. Wait several hours and observe.



Additional explorations:

- Try this experiment again but add an artificial sugar to one of the bottles instead of a real sugar. Does the balloon expand? Why or why not?

Discussion questions:

- What is yeast? Is it alive? How do you know?
- What balloon had the most gas inside it?
- Were there any balloons that did not inflate? Why not?
- Why did we include one container with no sugar? What does that tell us?