Investigating the effect of sugar concentration on yeast fermentation

Activity Sheet

Precautions during conducting an experiment:

- Never taste or ingest any materials provided.
- Do not eat or drink while performing experiments.
- Wash your hands before and after performing experiments.

In your disposal you have a stand with 5 test tubes, a cup with yeast mixture (solution) and a cup of sugar solution. Label the test tubes by numbers and add the yeast mixture (solution) and the sugar solution according to the following table below. Mix up each mixture. Mark with a permanent marker the level of the mixture. Do not cover the test tubes with their lid (leave them open).

Test tube number	Yeast mixture volume (ml)	Number of drops of sugar solution	Length of foam (cm)
1	5	0	
2	5	5	
3	5	10	
4	5	15	
5	5	30	

Place each test tube for 10 minutes in warm water. This process is called the **incubation period**. It is advised to place the test tubes in their test tube stand in the water.

1. In which test tube do you think the length of the foam will be the greatest?
   _____
   _____

After the incubation period, immediately mark with a pen the upper border of the foam and measure the distance between the lower and the upper border - this is the height of the foam. Measure using a ruler the length of the foam in each test tube and write it in the table above.

2. In which test tube the fermentation was the most active? What can be concluded from the result? _____
   _____
   _____
   _____

CHALLENGE QUESTION

The sugar is the reactant in the chemical reaction done by the yeasts in the fermentation process. In very high sugar concentration, the fermentation process seems to slow down. Why do you think that is?

a. Because when sugar concentration is very high, water enters the yeast cells and they consequently burst.

b. Because when sugar concentration is very high, water concentration is increased so the water enters the yeast cells.

c. Because when sugar concentration is very high, bacteria cells are multiplying and competing with the yeast over resources.

d. Because when sugar concentration is very high, water comes out of the yeast's cells and their activity is impacted.