**Factors Affecting Yeast Growth**

Yeast provides the leavening for many bread products. With moisture, a food supply, and water, yeast cells will grow and multiply. Yeast cells digest food and release two by-products: carbon dioxide and alcohol. The carbon dioxide is trapped in bread dough, creating a light, airy texture. The alcohol evaporates. In this experiment you will be testing two variables affecting yeast growth: food source and temperature.

**Part 1- How Food Source Affects Yeast Growth**

Materials: Tape, marker, 4-250 mL Erlenmeyer Flasks, 100 mL graduated cylinder, tablespoon, teaspoon, balloons, flour, salt, sugar

1. Using tape and a marker, label four Erlenmeyer flasks as follows: control, flour, sugar, and salt

2. Pour 100 mL of warm tap water into each container

3. Add 2 tsp yeast to each container.

4. Add 1 TBSP of flour, sugar, or salt to the appropriate containers.

5. Cover the top of each container with the mouth of a balloon. Swirl each container gently.

6. Record your observations at 5 minutes intervals for 20 minutes.

**Part 2-How Water Temperature Affects Yeast Growth**

Materials: Tape, marker, 4-250 mL Erlenmeyer Flasks, 100 mL graduated cylinder, 400 mL beaker, tablespoon, teaspoon, balloons, sugar, hot plate, thermometer

1. Water Preparation - Using tape and a marker, label four Erlenmeyer flasks as follows: ice water, tap water, warm water, boiling water. Do the following for the appropriate Erlenmeyer flask.

\*Fill a 400 mL beaker with about 200 mL of tap water and set it on a hot plate to boil. After it is boiling, place 100 mL of the boiling water to a 250 mL Erlenmeyer flask

\*In a 1000 mL beaker create a shallow ice bath. Place 100 mL of tap water in an Erlenmeyer flask and allow it to sit in the ice bath

\* Fill a 250 mL Erlenmeyer flask with 100 mL cold tap water.

\* Fill a 250 mL Erlenmeyer flask with 100 mL warm water from the octagon right before you are going to begin your experiment.

2. 3. Add 2 tsp yeast to each container.

4. Add 1 TBSP of sugar to each container.

5. Cover the top of each container with the mouth of a balloon. Swirl each container gently.

6. Record your observations at 5 minutes intervals for 20 minutes.

**Analysis**

1. For each part of the experiment, which container had the greatest carbon dioxide production? Explain your answer.

2. For Part 2 of the experiment, rank your flasks from best for yeast production to worst for yeast production. Explain how you decided on your ranking.

3. What predictions can you make about rising times for yeast bread that contain sugar?

4. What predictions can you makes about rising times for yeast bread that contain salt?

5. What predictions can you make about rising times for yeast breads that are sugar free?

6. Even though the yeast additionally produces alcohol, why is it safe to say there is no alcohol in the bread?