

# Pizza Making Laboratory

This laboratory exercise is designed to illustrate the complexity involved in the manufacture of a composite food, and the effects of ingredient selection on processing and finished product characteristics.

## Materials

regular yeast	sugar
pizza dough yeast	salt
flour	oil
pizza sauce	vegetables (peppers, mushrooms)
mozzarella (part-skim, fresh)	pepperoni
bowls	cheese grater
measuring cups & spoons	empty clear water bottles
pizza pans	balloons
pizza cutter	rubber bands
paper plates	temperature probe
marker	water bath weights

## Laboratory Methods

### Yeast Experiment – Effects of Ingredients & Temperature

This experiment was adapted from Red Star Yeast, Science of Yeast web page, <http://www.redstaryeast.com/science-yeast>.

#### Part I – Effect of Sugar & Salt on Fermentation

1. Label four 1- cup measuring cups with letters A – D.
2. To each cup, add ½ cup warm water (43-46°C).
3. Add to the cups:
  - B: 1 teaspoon sugar
  - C: 1 teaspoons salt
  - D: 1 teaspoon sugar + 1 teaspoon salt
4. Add 1 pkg (7 g) active dry yeast to each cup, and stir to dissolve yeast.
5. Let sit for 10 min.
6. Evaluate and record observations on the activity of yeast in each cup.

#### Part II – Effect of Flour & Temperature on Fermentation

1. Label 4 clear plastic water bottles with letters E – H.
2. To each bottle, add ½ cup room temperature water, 1½ teaspoons sugar and 1 teaspoon active dry yeast.

3. To 3 of the bottles (F - H) add 1 tablespoons flour.
4. Cap and swirl bottle to mix all ingredients.
5. Remove cap and top each bottle with a balloon and secure with a rubber band.
6. Make 2 water baths using saucepans. Fill one about ½ full with warm water (43-49°C), and the other about ½ full with ice water.
7. Put bottle G in the warm water bath and bottle H in the ice water bath. Use water bath weights if necessary to keep bottles submerged.
8. Evaluate and record observations every 10 min for a total of 40 min.

## Pizza Manufacture

### Pizza Variables

A = regular dough + part-skim mozzarella cheese

B = add an additional 2 teaspoons salt to above dough recipe + part-skim mozzarella cheese only

C = regular dough + fresh mozzarella cheese

D = regular dough + part-skim mozzarella cheese + green peppers + mushrooms + pepperoni

### Master Dough Recipe

1 ¾ - 2 ¼ cup	all purpose flour
1 envelope	pizza crust yeast
1 ½ teaspoon	sugar
¾ teaspoon	salt
2/3 cup	warm water (49-54°C)
3 tablespoon	oil

1. Combine 1 cup flour, yeast, sugar and salt in large bowl
2. Add water and oil, mix until well blended, about 1 min
3. Gradually add remaining flour until soft dough ball is formed, dough will be slightly sticky
4. Knead on a floured surface adding additional flour if needed, until smooth and elastic; about 4 min
5. With floured hands, pat and stretch dough to a 30 cm circle
6. Place dough on greased pizza pan
7. Top with ¾ cup sauce.
8. Top with 2 cups grated cheese and toppings as listed above.
9. Bake for 12 to 15 min at 220°C
10. Evaluate visual appearance immediately upon removing from oven, and record observations. Taste pizzas and record observations.
11. Bake commercial frozen pizza & microwave pizza according to instructions. Compare the appearance of commercial pizzas with experimental pizzas and record observations. Taste pizza and add flavor comments if desired.