Chapter 12

Yeast Breads

Yeast breads refer to any bread product leavened with yeast, such as breads, rolls, doughnuts, or cakes. Yeast ferments the carbohydrates in the dough to produce carbon dioxide. The carbon dioxide stretches the gluten to raise the bread. Yeast breads take longer to prepare than quick breads because they generally require kneading and time to rise before baking.

The process of making yeast bread includes mixing, kneading, fermenting, punching down, proofing, and baking. First, you mix the yeast, wet ingredients, and dry ingredients to form the dough. Then, you knead the dough by folding, pushing, and turning it repeatedly to develop the gluten. Next, you set the dough aside for **fermentation**. During this process, the yeast acts on sugar to release alcohol and carbon dioxide. The carbon dioxide gets trapped in the gluten and the dough rises as a result. When doubled in size, you gently punch the dough down. Punching down redistributes the food source, evens out the temperature within the dough, and releases gas to prevent large air holes from forming. Next, you shape the dough and allow it to **proof** or rise a second time. When doubled in size again, the dough is ready to be baked. It is important to learn about the action of yeast and characteristics of yeast breads so you can prepare many different bread products and answer your clients' questions about breads.

THINK ABOUT IT

- List some facts you know about yeast and the bread making process.

- List 3 things you would like to learn about yeast breads or 3 questions you have relating to yeast breads.

  1.

  2.

  3.

LAB ASSIGNMENT:

English Muffins, Rolls & More Yeast Breads

The emphasis of this laboratory is to focus on principals of yeast bread food formulations. You will experiment with the effects of using different flours and preparing different types of yeast breads.

Overview:

All students will view a demonstration of the proper technique for kneading dough and punching it down. Then, students will immediately begin preparing their assigned yeast bread in order to complete the assignments within the allotted time. Finally, students will taste all bread products, complete evaluations, and recipe costing activity.

Kitchen 1: Cinnamon Raisin English Muffins

Kitchen 2: Roman Flatbread

Kitchen 3: Garlic Parmesan Breadsticks

Kitchen 4: Whole Wheat Rolls

Kitchen 5: Cinnamon Twists

Kitchen 6: French Rolls

Kitchen 7: Yeast Rolls

Kitchen 8: Rye Rolls

Evaluation Tools:

- Evaluation of Variety of Yeast Breads
- Costing Yeast Bread

Directions:

1. Always begin by washing your hands and thoroughly cleaning/sanitizing work surfaces.
2. Gather ingredients needed for the assigned recipe.
3. Complete the assigned recipe.
4. Read "Yeast Bread Science" and "Yeast Bread Tips for Consumers." Complete the "Yeast Bread Questions."
5. Groups may begin to assist with dishwashing duties while the dough rises.
6. When all the breads are finished cooking, taste a sample of each and complete the evaluation tools.
7. Clean your work station and check out before leaving.

RECIPES:

English Muffins, Rolls & More Yeast Breads

Cinnamon Raisin English Muffins

Ingredients:

1 cup milk, scalded
2 tablespoons sugar
1 cup raisins
1 tablespoon yeast
1 egg, beaten
Cornmeal, as needed
1/4 cup margarine
1 teaspoon salt
4 cups flour, all-purpose, divided
1/4 cup water, 110° Fahrenheit
1 tablespoon cinnamon

Method:

1. Combine the milk, margarine, sugar, salt, and raisins in a mixing bowl. Allow to cool to lukewarm.
2. Add 2 cups of flour. Mix well.
3. Dissolve the yeast in the warm water. Let it stand for 5 minutes.
4. Add the yeast mixture and the egg to the batter. Mix well.
5. Add the remaining flour and the cinnamon. Mix well.
6. Knead the dough until smooth and elastic, about 5-8 minutes.
7. Place the dough in a greased bowl. Cover with a cloth and let it rise for about 1 hour.
8. Gently punch the dough down.
9. Roll the dough out on a surface that has been sprinkled with cornmeal. The dough should be ¼-inch thick.
10. Cut the muffins out using a 3-inch biscuit cutter.
11. Sprinkle the top of each muffin with cornmeal. Place muffins on an un-greased baking sheet. Cover and let proof (rise) for 45 minutes.
12. Heat an ungreased griddle or skillet over low heat.
13. Place the muffins on the griddle. Cook for about 12 minutes. Turn and continue cooking for an additional 12 minutes.
14. Let the muffins cool for a while. Split and toast.

Roman Flatbread

Ingredients:

1 tablespoon sugar
12 ounces water, 110° Fahrenheit
2 teaspoons, divided salt, Kosher
As needed olive oil
1 teaspoon basil
1/4 cup parmesan cheese
1 tablespoon yeast
1 pound, 2 ounces flour, all-purpose
1/3 cup onion, finely chopped
2 tomato, thinly sliced
2 teaspoons oregano

Method:

1. Combine the sugar, yeast, and water in a large bowl. Stir to dissolve the yeast.
2. Stir in the flour, 4 ounces at a time.
3. Stir in 1 1/2 teaspoons of salt and the onion. Mix well.
4. Knead the dough until smooth and elastic, about 5-8 minutes.
5. Put the dough in an oiled bowl and cover. Place in a warm spot and let rise for about 1 hour.
6. Gently punch the dough down. Then press the dough onto an oiled half sheet pan. The dough should be no more than 1-inch thick.
7. Brush the dough with the olive oil. Allow to proof until doubled, about 15 minutes.
8. Preheat oven to 400° Fahrenheit.
9. Top the dough with the tomato, basil, oregano, parmesan cheese, and the remaining salt.
10. Bake for about 20 minutes.
11. Cut the dough into 24 even pieces using a knife or pizza cutter.

Garlic Parmesan Breadsticks

Ingredients:

- 1 ounce sugar
- 10 ounces water, 110° Fahrenheit
- 1 pound, 2 ounces flour, bread, divided
- 1 ounce parmesan cheese
- 1/2 ounce yeast
- 4 1/2 ounces olive oil, divided
- 2 teaspoons salt
- 2 tablespoons garlic, minced

Method:

1. Combine the sugar, yeast, and water in a large bowl. Stir to dissolve the yeast.
2. Add 4 ounces of olive oil, 8 ounces of flour, and the salt.
3. Gradually add the remaining flour.
4. Knead the dough until it is smooth and elastic, about 5-8 minutes.
5. Remove the dough from the bowl and allow it to rest for 5-10 minutes.
6. Roll the dough into a rectangle, about ¼-inch thick.
7. Cut the dough into 24 even pieces using a knife or pizza cutter. Roll each piece into a rope and twist. Place on a baking sheet lined with parchment paper.
8. Cover and place the dough in a warm area until doubled in volume, about 20 minutes.
9. Preheat oven to 375° Fahrenheit.
10. Brush the top of each breadstick with the remaining oil and sprinkle with parmesan cheese and garlic.
11. Bake for about 12-15 minutes.

Whole Wheat Rolls

Ingredients:

1 teaspoon salt
13 ounces flour, whole wheat, divided
1/4 ounce yeast
1/2 ounce butter
3/4 ounce dry milk
9 ounces water, 110° Fahrenheit
1 1/2 ounce honey

Method:

1. In a large mixing bowl, combine the salt, dry milk, and 6 ounces of the flour.
2. Stir in the hot water, yeast, honey, and butter. Beat until combined into a batter-like consistency.
3. Add the remaining flour, a little at a time. Knead for about 8 minutes.
4. Place the dough in a greased bowl. Cover and place in a warm spot to rise for about 1 hour.
5. Preheat oven to 375° Fahrenheit.
6. Punch down and shape into 1 1/4-ounce rolls. Cover and let proof (rise) until doubled.
7. Bake the rolls for about 15 minutes.

Cinnamon Twists

Ingredients:

- 10 cups flour, all-purpose
- 2 teaspoons salt
- 2 tablespoons yeast
- 2 cups buttermilk
- 1 cup margarine
- 1 cup brown sugar
- 1 cup pecans, chopped
- 3 cups powdered sugar, sifted
- 1 cup + 2 tablespoons sugar, divided
- 1/2 cup dry milk
- 1/2 cup water, 110° Fahrenheit
- 1/2 teaspoon baking soda
- 4 eggs, beaten
- 2 teaspoons cinnamon
- 4 tablespoons, margarine, melted, divided
- 1/4 cup water, hot

Method:

1. Combine the flour, 1 cup of sugar, salt, and dry milk.
2. In a small bowl, dissolve the yeast and the remaining 2 tablespoons of sugar in the warm water, set aside to use in step 5..
3. In a small sauce pan, bring the buttermilk to a boil. It will curdle.
4. Add the baking soda and 1 cup of margarine to the buttermilk. Cool to lukewarm in a large mixing bowl.
5. Add the beaten eggs and yeast mixture to the buttermilk mixture.
6. Add 5-5 1/2 cups of the flour mixture to the buttermilk mixture, mix until a soft dough is formed.
7. Sprinkle your breadboard with some of the remaining flour mixture. Knead the dough until smooth and elastic, about 5-8 minutes.
8. Lightly grease a bowl and place the dough inside of it. Cover with plastic wrap and let rise in a warm place for about 1 hour.
9. While the dough rises, combine the brown sugar, cinnamon, and pecans in a small bowl.
10. Grease two baking sheets.
11. Gently punch the dough down. Roll the dough into a 12x20-inch rectangle.
12. Brush the dough with 3 tablespoons of the melted margarine.
13. Sprinkle the brown sugar mixture length-wise over half of the dough to within 1/2-inch of the long edge. Fold the dough in half and seal the edges.
14. Cut into strips about 3/4-inch wide.
15. Twist each strip length-wise and then twist into a circle. Place on a prepared baking sheet. Cover and let rise until doubled.
16. Preheat oven to 375° Fahrenheit.
17. Bake until golden brown, about 12 minutes.
18. Combine the powdered sugar, the remaining 1 tablespoon of margarine, and the hot water. Drizzle on the warm twists.

French Rolls

Ingredients:

- 1 pint water, 110° Fahrenheit
- 1 pound, 6 ounces flour, bread
- 1/2 ounce yeast
- 1/2 ounce salt

Method:

1. Combine the water and yeast in a mixing bowl.
2. Add the flour and salt. Mix on low speed with a dough hook attachment until all of the flour is incorporated.
3. Increase to the second speed and knead the dough until it is smooth and elastic.
4. Let the dough rise in a warm place until doubled, about 1 hour.
5. Preheat oven to 400° Fahrenheit. Place a pan of water in the oven for steam.
6. Punch down and shape the dough into 1 to 1 1/4-ounce rolls.
7. Place on a parchment lined baking sheet. Let proof until doubled.
8. Bake for about 12 minutes.

Yeast Rolls

Ingredients:

- 10 ounces water, 110° Fahrenheit
- 1 pound, 6 ounces flour, bread
- 2 ounces sugar
- 1 ounce shortening
- 2 ounces eggs, beaten
- 1 ounce yeast
- 1/2 ounce salt
- 1 ounce dried milk
- 1 ounce butter

Method:

1. Combine the water and yeast in a small bowl.
2. Combine the remaining ingredients in a large mixing bowl. Add the water and yeast mixture and stir. Knead for 10 minutes using a dough hook mixer attachment or by hand on a floured work surface.
3. Place the dough in a lightly greased bowl. Cover and let rise in a warm place, for about 1 hour.
4. Punch down the dough.
5. Divide the dough into 1 1/4-ounce portions and shape into balls. Place on baking sheets lined with parchment paper.Cover and allow to proof (rise) until doubled in size.
6. Preheat the oven to 400° Fahrenheit.
7. Bake for about 12 minutes.

Rye Rolls

Ingredients:

8 ounces flour, wheat
1 1/2 ounces dark molasses
1/4 ounce yeast
1 tablespoon caraway seeds, crushed
1 1/2 teaspoons butter
4 ounces flour, rye
10 ounces water, 110° Fahrenheit
3/4 ounce dry milk
1 1/2 teaspoons salt

Method:

1. Combine the wheat and rye flours in a bowl and set aside.
2. Combine the molasses, water, and yeast in another bowl. Add 8 ounces of the flour mixture.
3. Stir vigorously for 3 minutes to form a soft dough. Cover the bowl and let rise for about 30 minutes.
4. Combine the dry milk, caraway seeds, salt, and butter and stir into the flour mixture. Gradually add the remaining flour. Stir to form a moderately stiff dough.
5. Knead the dough until smooth and elastic, about 5-8 minutes.
6. Place in a greased bowl. Cover and let rise in a warm place for about 45 minutes.
7. Shape the dough into 1-ounce rolls. Place on baking pans lined with parchment paper. Cover and let rise for 45 minutes.
8. Preheat oven to 375° Fahrenheit.
9. Bake for about 15 minutes.

EVALUATION OF VARIETY OF YEAST BREADS

1. Taste each variation and place the numerical score for each characteristic in the upper left hand corner of each box. (Score System: 1=very poor; 2=poor; 3=fair; 4=medium; 5=good; 6=very good; 7=excellent)
2. Provide comments/description to justify the numerical score.

QUALITY CHARACTERISTICS	APPEARANCE	CONSISTENCY/ TEXTURE	TENDERNESS	FLAVOR	OVERALL QUALITY
CINNAMON RAISIN ENGLISH MUFFINS					
ROMAN FLATBREAD					
GARLIC PARMESAN BREADSTICKS					
WHOLE WHEAT ROLLS					
CINNAMON TWISTS					
FRENCH ROLLS					
YEAST ROLLS					
RYE ROLLS					

COSTING YEAST BREAD (THE VARIETY YOU MADE)

My Variety _____

1. List each ingredient, cost for amount purchased and unit purchased, and amount used in recipe in the table below. You will need to get a copy of the receipt from your instructor.
2. For each ingredient, calculate and record the cost for the amount used.
3. Calculate the total cost to prepare your grain recipe.

INGREDIENT	COST FOR AMOUNT PURCHASED AND UNIT PURCHASED	AMOUNT USED IN RECIPE	COST FOR AMOUNT USED
Total cost to prepare your yeast bread variety:			

LEARN MORE:

Yeast Bread Science:

- Each ingredient in yeast breads serves one or more functions. These functions include leavening, tenderizing, flavoring, adding textures, or affecting the appearance of the final product. Similar ingredients are used for quick breads and yeast breads. One difference is the use of yeast in yeast breads.

- Flour provides the proteins (gliadin and glutenin) that combine to form the structural protein gluten which expands as bread rises. Bread flour and all-purpose flour are typically used in yeast breads due to their higher protein content and therefore higher **gluten** formation. Starch in flour provides additional structural support for bread. During the fermentation process, amylase enzymes in flour aid in breaking starch down into sugar.

- Liquid ingredients moisten or hydrate the bread proteins, yeast, and starch. The liquid ingredients serve as a medium for dissolving dry ingredients, such as salt and sugar, and create steam which tenderizes the bread. Milk is often used in yeast breads as the moistening agent because it improves the nutritional value of bread and provides a source of nitrogen for the yeast. Pasteurized milk should be warmed (105-115° Fahrenheit) to create an optimal temperature for the yeast. Water and potato water are also commonly used.

- Yeast serves as the leavening agent. Enzymes in yeast act on sugars to produce carbon dioxide, which fills and expands existing gas cells, causing the bread to rise. Alcohol and flavor compounds are produced during the fermentation process too. They give bread its distinct aroma and flavor. Active-dry yeast, instant yeast, compressed/cake yeast, cream/liquid yeast, or sour starters are different types/forms of yeast that are used in bread making.

- Sugar serves as food for yeast and can aid in browning the crust via the **Maillard reaction** and **caramelization**. Added sugar is not a necessary ingredient because flour contains a small amount of sugar. However, adding a little sugar promotes yeast growth.

- Salt serves to enhance the flavor of bread and controls the rate of fermentation. Too much salt slows fermentation and not enough salt allows the yeast to grow too fast.

- As flour naturally contains a small amount of fat, added fat is not a required ingredient for yeast breads. When added, fat aids in tenderizing the bread and enhancing the flavor.

- Eggs are another optional ingredient for yeast breads. When added, eggs serve to emulsify ingredients, enhance flavor and color, and provide nutritional value.

- Under-mixing, over-mixing, insufficient rising time, and mis-proportioned ingredients may cause your yeast breads to be of poorer quality. Outlined below are potential failures and causes.

  - **Irregular shape** – Poor dough shaping prior to baking, pan is too small, or an insufficient rising time
  - **Size**
    - *Too Small* – Insufficient rising time, too much salt, too little yeast, or too low oven temperature
    - *Too Large* – extended rising time, too little salt, too much yeast, or too low of an oven temperature
  - **Color**
    - *Pale* – insufficient rising time, excessive handling of over risen dough, too little sugar, or too low of an oven temperature
    - *Dark* – insufficient rising time, too much sugar, or oven too hot
    - *Uneven/Streaked* – poor mixing of dough, poor dough shaping prior to baking, poor oven placement, or oven too hot
  - **Texture**
    - *Course* – too low of an oven temperature, or low grade flour
    - *Crumbly* – poor gluten development, or extended rising time
  - **Crust**
    - *Thick* – too much salt, or over baked
    - *Cracked* – dough drying out during rising, or cooled too fast
    - *Blisters* – poor dough shaping prior to baking, or extended rising time
  - **Flavor** – mis-proportioned ingredients, extended rising time, or incomplete baking

Yeast Bread Tips for Consumers:

- The nutritional content of yeast breads can vary dramatically depending on the ingredients. Yeast breads made from 100% whole grain flours may contain more vitamins and minerals such as magnesium, zinc, vitamin B_6, and vitamin E. Whole grains breads, such as whole wheat bread, typically contain more fiber than breads made from refined flour. For example, one cup of whole wheat flour contains about 13 grams of fiber; while, the same amount of enriched white, all-purpose flour contains about 3 grams of fiber. Similarly, one cup of pure dark rye flour contains about 31 grams of fiber and light rye flour contains about 8 grams of fiber. It is also important to be aware that yeast breads made with added fats or sugars, such as cinnamon twists or doughnuts, are less nutrient-dense.

- Bread makers should be aware of the conditions in which dough is left to rise. Dough rises more rapidly at warmer temperatures, between 75 and 85° Fahrenheit. Colder temperatures slow the growth of yeast and higher temperatures may kill the yeast. When proofing dough, you normally place the dough in a greased mixing bowl or on a greased baking pan and cover with a cloth or plastic wrap. Next, you place the dough in a warm area such as the top of a gas oven (turned off but warmed with pilot lights) or in an oven that was briefly heated (1-2 minutes) at a low temperature and turned off. You should avoid proofing dough in drafty spaces.

- You can test the readiness of proofed dough by pressing two fingers into the dough. If your fingers leave an indentation, the bread is ready for baking. If the dough springs back into shape, more rising time is needed.

- Scoring dough before baking can prevent cracks from forming during baking. You can score dough by cutting 1/4-inch deep diagonal slits along the top of the bread.

Yeast Bread Questions

1. The ingredients for bread dough can be combined by the straight-dough, sponge-dough, no-knead, or cool-rise mixing method. Match the mixing method with the description.

____ Straight-dough

____ Sponge-dough

____ No-knead

____ Cool-rise

A. The liquid is heated and mixed with the yeast. One-third of the flour and all other ingredients are added and blended. The remaining flour is gradually added. Next, the dough is kneaded and allowed to rise. The dough is punched down, shaped, and allowed to rise again.

B. Yeast, water, and a portion of the flour are mixed together. The yeast is given time to rise, and will double in size. Then, the remaining ingredients are added to form a dough, which is kneaded. The dough is allowed to rise. It is punched down, shaped, and allowed to rise again.

C. All of the ingredients are blended together. Less flour and more fat are incorporated in this method. The dough is then shaped and allowed to rise.

D. The liquid is heated and mixed with the yeast. One-third of the flour and all of the other ingredients are added and beaten. Another 1/3 of the flour is added and vigorously beaten. The remaining flour is added, the dough is shaped using a rolling pin, and is then placed in the refrigerator to rise. When removed from the refrigerator, the dough is allowed to double in size before baking.

2. Why is warm milk used for making yeast breads?

3. Why is the dough kneaded?

4. Why is the dough punched down?

5. What is proofing?

Yeast Breads Teacher Tips

Overview

This laboratory should be scheduled late in the course and will take approximately 2 ½ hours to complete.

- Dough needs time to rise. Timing is important if evaluation is to occur.
- This lab, like quick breads, allows students to study flour as a structural ingredient. In this lab, students will also study the evolution of carbon dioxide gas from yeast. Yeast breads refer to any bread product leavened with yeast including breads, rolls, doughnuts, and cakes.
- Careful measuring of ingredients and skill in handling the dough will effect the final product.

Lab Management

Demonstrations

- Demonstrate the use of a dough hook on a mixer for kneading dough. Most instructions for kneading state "knead until the dough pulls cleanly from the sides of the bowl, but still clings slightly to the bottom of the bowl." This is a good indicator of how well-developed the dough should be for that recipe. If available, compare and contrast dough kneaded by hand and kneaded by machine (e.g. time, consistency, and final product characteristics).
- Discuss and demonstrate ways to determine gluten development.
- The term "artisan" is being applied to breads. What does that mean?
- Demonstrate what a griddle or skillet is. You will want to identify what to use.
- Discuss the reasons for sifting flour. Compare and contrast products made with unsifted flour, pre-sifted flour, and flour sifted just before use.
- Compare and contrast flours with different levels of protein and gluten. What type of yeast breads do they produce?
- Discuss the reason some recipes call for scalding the milk. When is it necessary? Describe what scalded milk looks like.

Time Management

- The cinnamon twist recipe takes the longest amount of time. This group should begin as soon as class starts. This recipe also makes a lot of dough and a standard table mixer may not be large enough to knead all of the dough at once.
- During downtime, students can clean the kitchen space and begin working on their "while you wait" questions.
- Yeast will be used for this lab. Explain to students that warm water is to be used to activate the yeast. If the water is too hot, they will kill their yeast.
- If dough remains too sticky after all of the flour is used, groups may need to add more to get a better consistency.
- Groups preparing the cinnamon raisin English muffins will need to keep a close eye on their muffins when they are cooking on the stovetop. If they are heated on too high of a heat, they will burn the bottoms.

Sensory Evaluation

- Instruct the students on how to display and when to evaluate the products. As time allows, a student from each kitchen should comment about the preparation of the dish and the final product.
- Students may not be familiar with the characteristics of high quality bread products. Describe and demonstrate them to the students.

Nutrition Points for Discussion:

- Discuss the function of fat in each of the recipes where it is used. Very little fat is used in bread making. Discuss how solid fat and oil function in the bread making process.
- Select a nutrition tip for yeast bread recipes. For example:
  - Salt is a required ingredient in yeast dough. How can Americans reduce their sodium consumption while still enjoying bread products?
  - Compare the Nutrient Facts of gluten free and regular yeast bread products. What advice do you give to an individual choosing a gluten free product?

SHOPPING LIST: (8 SECTIONS)

Item	Utilized Unit/Lab Section	Purchased Unit
Onion	1/3 cup	1
Tomato	2	2
Garlic, minced	2 TBSP	1 head
Olive oil	4 oz	1 bottle
Honey	1 ½ oz	1 bottle
Raisins	1 cup	1 box
Rye flour	4 oz	1 bag
All-purpose flour	4 ¾ lbs	5 lb bag
Bread flour	4 lbs	5 lb bag
Whole wheat flour	1 ½ lbs	5 lb bag
Sugar	10 ½ oz	1 bag
Brown sugar	1 cup	1 bag
Powdered sugar	3 cups	1 bag
Salt, kosher	2 tsp.	1 box
Salt	4 ½ TBSP	1 cont.
Pecans, chopped	1 cup	1 bag
Dark molasses	1 ½ oz	1 jar
Yeast	4 ½ oz	1 cont.
Baking soda	½ tsp.	1 cont.
Cinnamon	5 tsp.	1 cont.
Basil	1 tsp.	1 cont.
Oregano	2 tsp.	1 cont.
Caraway seeds	1 TBSP	1 cont.
Cornmeal	As needed	1 cont.
Dry milk	6 ½ oz	1 box
Shortening	1 oz	1 cont.
Parmesan cheese	3 oz	1 cont.
Milk	1 cup	1 pint
Buttermilk	2 cups	1 pint
Margarine	1 ½ cups	1 box
Butter	1 ¾ oz	1 block
Eggs	7	1 dozen