




# Yeast Dough Production



# Yeast Dough Preparation

- ▶ Yeast breads and rolls can be prepared by traditional “hand” methods. However, larger quantities and faster turnover times are often required, Yeast breads and rolls can also be prepared through an automated process known as continuous bread making.
  - ▶ The steps in bread making varies slightly depending on which type you are making. However, the same general stages apply:
    - ▶ 1. Scaling Ingredients
    - ▶ 2. Mixing and Kneading
    - ▶ 3. Fermentation
    - ▶ 4. Dividing dough
    - ▶ 5. Rounding Dough
    - ▶ 6. Bench Rest
    - ▶ 7. Shaping Dough
    - ▶ 8. Panning Dough
    - ▶ 9. Final Proofing
    - ▶ 10. Baking Dough
    - ▶ 11. Cooling Dough
    - ▶ 12. Packaging Dough
- 



# Mixing Methods



- ▶ There are 3 methods used for making yeast dough:
  - ▶ 1. Straight-Dough Method: You will use this method to make the most basic breads. This method calls for mixing all the ingredients together in a single step. This method allows the yeast to begin acting on all of the ingredients immediately.
  - ▶ 2. Modified Straight-Dough Method: this method breaks the straight dough method into steps. These steps allow for a more even distribution of sugars and fats throughout the dough.
    - ▶ A. dissolve yeast in part of the water
    - ▶ B. Combine the fat, sugar, salt, milk solids, and flavorings
    - ▶ C. Mix well, but do not whip
    - ▶ D. Add eggs one at a time
    - ▶ E. Add the rest of the liquids and mix briefly
    - ▶ F. Add the flour and dissolved yeast last
    - ▶ G. Mix until a smooth dough forms




# Continued...

- ▶ **Sponge Method:** The sponge method allows the yeast to develop separately before it is mixed with the other ingredients. This method results in a more intense flavor and a lighter, airy texture. Here are the basic steps:
  - ▶ Combine 50% water with 50% flour
  - ▶ Add the yeast. Sugar or malt may also be added to this mixture to promote faster yeast growth
  - ▶ Cover the sponge. Let it rise in a warm place for two to three hours or until it doubles in size
  - ▶ Combine the sponge with the remaining ingredients



# Scaling Ingredients

- ▶ Accurate measurements are important when using any recipe, scaling ingredients to meet the quantity you are making is common in bakeries. Foodservice operations often post the procedures for converting percentages to weight and weight to percentages.
- 



# Mixing and Kneading

- ▶ Kneading means to work the dough until it is smooth and elastic.
- ▶ In continuous bread making or commercial baking, mixing and kneading are done in a spiral mixer. There are four stages to this:
  - ▶ Pickup: Use a low speed to mix the water and yeast. Then incorporate the dry ingredients and add solid fats or shortenings last.
  - ▶ Cleanup: During this stage, the ingredients come together into a ball. At this stage all of the water is absorbed into the flour.
  - ▶ Development: During this stage, oxygen is incorporated into the dough and gluten is developed. The dough will be uneven in color and tear easily.
  - ▶ Final Clear: At this point you should be able to stretch the dough several times without it breaking. Now you can remove the dough from the mixer.





# Fermentation



- ▶ Once the dough has been kneaded or has reached the final clear stage in a mixer, the dough is ready for fermentation. Fermentation is the process by which yeast converts the sugars in dough to alcohol and carbon dioxide. Gases that are trapped in the gluten cause the dough to rise.
- ▶ For fermentation to take place, shape the kneaded dough into a ball, coat it with a thin film of oil, cover and let it stand. The dough is ready when it has doubled in size. At this point the dough is ready to be punched.




# Fermentation continued..

- ▶ Punching: the action of turning the sides of the dough into the middle and turning the dough over is called punching. Punching accomplishes 4 things:
  - ▶ 1. Maintaining the dough temperature
  - ▶ 2. Releasing carbon dioxide
  - ▶ 3. Introducing oxygen
  - ▶ 4. Developing gluten





# Fermentation continued...

- ▶ **Dividing Dough:** Once the dough has been punched, it must be divided for baking. To divide the dough, use a bench scraper to cut the dough into uniform pieces. You will need to work quickly when portioning dough. Fermentation continues during this process.
  - ▶ **Rounding Dough:** Divided dough must be rounded or shaped into smooth balls. Rounding the dough provides it with a skin to prevent the loss of too much carbon dioxide.
- 




# Fermentation continued...

- ▶ Bench Rest: Depending on the formula, at this time the rounded portions may need to be placed in bench boxes or left covered on a work station. This short intermediate proofing stage, called bench rest, allows the gluten to relax. The dough becomes lighter, softer and easier to shape.
- ▶ Shaping Dough: Some general principles apply to the shaping process.
  - ▶ Work quickly
  - ▶ Shape pieces in order
  - ▶ Use very little flour
  - ▶ Place any seam at the bottom: a seam are places where the edges of the dough meet. The seam is the weakest part of the piece.

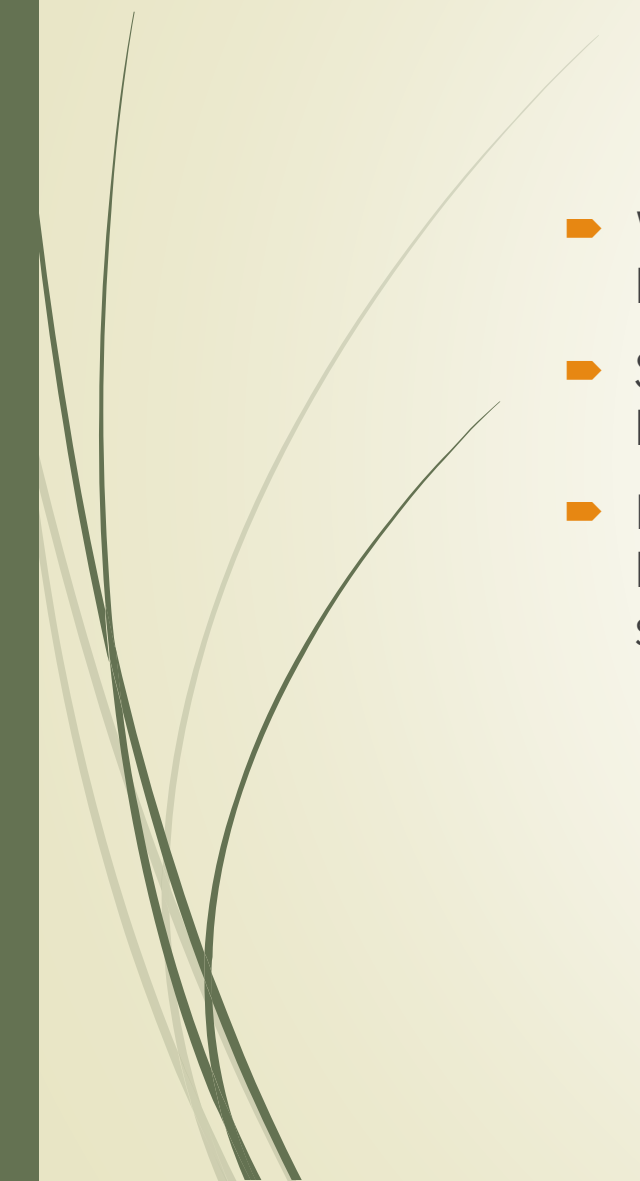


# Final Proofing

- ▶ The final fermentation stage for regular yeast dough is called final proofing. Proofing allows leavening action of yeast to achieve its final strength before yeast cells are killed by hot oven temperatures. Final proofing requires higher temperatures and humidity levels than fermentation temperatures. The use of a proofer is essential to maintain these conditions. Proofing time is shortened for rich and sweet doughs.
- 




# Washing, Slashing and Docking

- ▶ Washing: Applying a thin glaze of liquid to the dough's surface before baking.
  - ▶ Slashing: Making shallow cuts in the surface of the item before baking. This helps gases escape the hard crusted breads during baking.
  - ▶ Docking: The process of making small holes in the surface of an item before baking. Used primarily with rich doughs or rolled-in doughs, docking allows steam to escape and promotes even baking.
- 



# Baking Yeast Dough

- ▶ Baking is the process that changes dough into breads or rolls through the application of heat.
    - ▶ Dough type. Young, underfermented doughs require cooler oven temperatures, higher humidity and longer baking times than fully proofed doughs.
    - ▶ Dough richness. Lean doughs require higher oven temperatures and shorter baking times. Rich doughs require lower oven temperatures and longer baking times.
    - ▶ Portion size. Smaller items require shorter baking times.
    - ▶ Desired color. This depends on the taste of the customer. Higher temperatures and longer baking times will yield a darker crust.
- 




# Stages of Baking

- ▶ As yeast dough products bake, their internal temperatures rise. Each of the four stages of the baking process contributes to the final product:
  - ▶ 1. Oven spring. During the first five minutes of baking, the dough suddenly rises and expands as the yeast reacts to the heat of the oven. The final leavening effort, occurring before the internal temperatures become hot enough to kill the yeast cells, is called oven spring.
  - ▶ 2. Structure develops. As the internal temperature rises from 130 degrees F, starch granules in the dough begin to absorb moisture and swell up. At 150 degrees F the starches gel and become the final structure of bread. At 165 degrees F, the gluten begins to dry out and coagulate as the starch gel replaces it. The crumb is formed at this stage.
  - ▶ 3. Crust forms. At 165 degrees F, the crust begins to form as the starches and sugars on the surface begin to brown and thicken.
  - ▶ 4. Finished product. By the time the internal temperature has reached 165 degrees F, the alcohol will have evaporated.





# Testing for Doneness

- ▶ Appearance is not the best test for doneness. A better gauge of whether a product is done is the thump test. Tap the top of the loaf. If the loaf gives off a hollow sound, indicating that it is filled with air and not moisture, it's done.
- 



# What went wrong?

Product Failure	Possible Causes
Poor shape	<ul style="list-style-type: none"><li>*too much liquid in dough</li><li>*Improper shaping of dough</li><li>*Incorrect proofing</li><li>*too much steam in oven</li></ul>
Blisters on crust	<ul style="list-style-type: none"><li>*too much liquid in dough</li><li>*improper fermentation</li></ul>
Top crust separates from the loaf	<ul style="list-style-type: none"><li>*loaf poorly shaped</li><li>*top not slashed</li><li>*dough dried out during proofing</li><li>*lack of moisture in oven</li></ul>
Large holes in crumb	<ul style="list-style-type: none"><li>*too much yeast</li><li>*overkneaded dough</li><li>*inadequate punching of dough</li></ul>
Poor flavor	<ul style="list-style-type: none"><li>*improper fermentation</li><li>*insufficient salt</li><li>*overproofing</li></ul>



# Questions



- ▶ Define fermentation and explain when it takes place.
- ▶ Describe the state of yeast at temperatures above 138 degrees F.
- ▶ Explain the sponge method and its use.
- ▶ What are the benefits of thoroughly mixing the yeast dough?