

Chapter 23

Breads

Oven Tender

Tends stationary or rotary hearth oven that bakes breads, pastries, and other bakery products.

Baker

Mixes and bakes ingredients according to recipes to produce breads, pastries, and other baked goods.

Dividing-Machine Operator

Tends machines that automatically divide, round, proof, and shape dough into units of specified size and weight, according to work order, preparatory to baking.



Terms to Know

batter
dough
leavening agent

gluten
fermentation

Objectives

- After studying this chapter, you will be able to
- describe how to select and store baked goods.
 - identify the functions of ingredients in baked products.
 - prepare quick breads and yeast breads.

You can prepare *quick breads* in a short amount of time. Quick breads include biscuits, muffins, popovers, cream puffs, pancakes, and waffles. They also include coffee cakes and breads leavened with baking powder.

Yeast breads require more time to prepare than quick breads. Yeast breads include breads, rolls, English muffins, raised doughnuts, crullers, and many other yeast-raised products.

Selecting and Storing Baked Products

Quick breads and yeast breads are *baked products*. Cakes, cookies, and pies are baked products, too. Some of the following information applies to *all* baked products. However, preparation of cakes, cookies, and pies differs from preparation of breads. Therefore, cakes, cookies, and pies will be discussed further in the next chapter.

You can purchase baked products freshly baked, partially baked, refrigerated, and frozen. *Freshly baked items* are sold in bakeries, in bakery sections of supermarkets, and on supermarket shelves. They are ready to serve. *Brown-and-serve baked goods* are partially baked. They need a final browning in the oven before serving. *Refrigerated doughs* are ready to bake. They are handy for quickly preparing items like biscuits, turnovers, cookies, and rolls. *Frozen doughs and baked goods* require thawing and/or baking. Yeast doughs and cookie doughs are available frozen. You can buy frozen pies, cakes, coffee cakes, and doughnuts, too.

Cost of Baked Products

The cost of rolls, cakes, and other bakery products depends a lot on the amount of convenience. Ready-to-serve items usually cost more than items that require some preparation. Bakery yeast rolls, for instance, usually cost more than frozen yeast rolls.

Bread costs depend on size of loaf, extra ingredients, and brand. Large loaves usually cost less per serving than small loaves. Breads with fruit and nuts cost more than plain white or wheat bread. Store brands generally cost less than national brands.

Storing Baked Products

You can store freshly baked items at room temperature or in the freezer, tightly wrapped, 23-1. Freezing bread in hot, humid weather prevents mold growth. You can take slices of bread from the freezer as needed to thaw and eat. Refrigerate any baked products with cream, custard, or other perishable fillings or frosting.

Keep refrigerated doughs refrigerated until you plan to bake them. Likewise, store frozen doughs and baked products in the freezer until you are ready to use them.

Quick Breads

Quick breads may be made from batters or doughs. Both batters and doughs are mixtures of flour and liquid. **Batters** range in consistency



Cherry Marketing Institute

23-1 This freshly baked bread can be wrapped and stored at room temperature.

from thin liquids to stiff liquids. Thin batters are called *pour batters*. They have a large amount of liquid and a small amount of flour. You make a pour batter to prepare pancakes and popovers. Stiff batters are called *drop batters*. They have a high proportion of flour, and you can drop them from a spoon. You make a drop batter to prepare drop biscuits and some muffin recipes. **Doughs** have an even higher proportion of flour. They are stiff enough to shape by hand. You use soft dough to prepare shortcake and rolled biscuits. You use stiff dough to make rolled cookies and pastry.

Quick Bread Ingredients

Flour is a basic ingredient in all quick breads. However, the kinds of ingredients added to the flour distinguish one product from another. Leavening agents, liquid, fat, eggs, sugar, and salt are among the other ingredients that may be part of quick breads. Each ingredient serves a specific purpose.

Q: Doesn't a slice of toast have fewer calories than a slice of bread?

A: No. The heat of toasting removes water from bread but not calories.

Flour

Flour gives structure to baked products. White wheat flours are most often used for baking. Most quick breads are made with *all-purpose flour*. Some recipes call for *self-rising flour*. This is all-purpose flour with added leavening agents and salt.

Healthy Living

Breads, which are part of the grains group of MyPyramid, are an excellent source of complex carbohydrates. They also supply B vitamins and iron. Most teens need 6 to 10 ounce equivalents from the grains group each day, depending on calorie needs. One slice of bread and one small biscuit or muffin each count as one ounce equivalent. Half a sandwich bun or one-fourth of a large bagel also counts as one ounce equivalent. When buying breads, choose whole grain items most often. They are higher in fiber than refined bread products.

Leavening Agents

Leavening agents are ingredients that produce gases in batters and doughs. These gases make baked products rise and become light and porous. Two leavening agents used in quick breads are baking soda and baking powder. Chemical reactions during baking cause these ingredients to release *carbon dioxide* gas.

Baking soda is sodium bicarbonate,

which is an alkaline ingredient. It is used in quick bread recipes that contain food acid ingredients, which neutralize the alkali. This prevents a bitter, alkaline taste from forming in the bread. Food acid ingredients include buttermilk, molasses, brown sugar, vinegar, honey, applesauce or other fruit, and citrus juices. See 23-2.

Baking powders contain a dry acid or acid salt, baking soda, and starch or flour. Be sure to follow guidelines for using the recommended amount of baking powder. Too much baking powder will produce too much carbon dioxide, and the baked product will collapse. Too little baking powder will not produce enough carbon dioxide, and the product will be small and compact.

Two gases other than carbon dioxide that make baked products rise are steam and air. **Steam** is produced when liquid ingredients reach high temperatures during baking. Popovers and cream puffs are leavened almost entirely by steam. **Air** is incorporated into baked products by beating eggs, creaming fat and sugar together, folding doughs, and beating batters. All baked products contain some air.

Liquids

Water, milk, and fruit juices are liquids commonly used in baked products. Eggs and fats are also considered to be liquid ingredients.

Liquids serve several functions. They *hydrate* (cause to absorb water) the protein and starch in flour. Proteins must absorb water to later form gluten. Starches must absorb water to gelatinize during baking. Another function of

liquids is to moisten or dissolve ingredients such as baking powder, salt, and sugar. Liquids also serve as leavening agents when they are converted to steam during baking.

Fat

Fat serves primarily as a tenderizing agent in baked products. The fat coats the flour particles and causes the dough structure to separate into layers. Fat also aids leavening. When you beat fat, air bubbles form. The fat traps these air bubbles and holds them.

Eggs

Eggs help incorporate air into baked products when you beat them. They also add color

Be a Clever Consumer

Compare carefully when shopping for baked products. Although added convenience usually means added cost, there are exceptions. For instance, a devil's food cake made from a mix is often less expensive than one made from scratch. Also, keep in mind that convenience can be worth the extra cost when you are in a hurry.

and flavor and contribute to structure. During baking, the egg proteins coagulate. The coagulated proteins give the batter or dough elasticity and structure.

Sugar

Sugar gives sweetness to baked products. It also has a tenderizing effect and helps crusts brown. In yeast breads, sugar serves as food for

the yeast. Brown sugar gives a distinctive flavor to baked products. It also produces baked products that are moister than products made with granulated sugar.

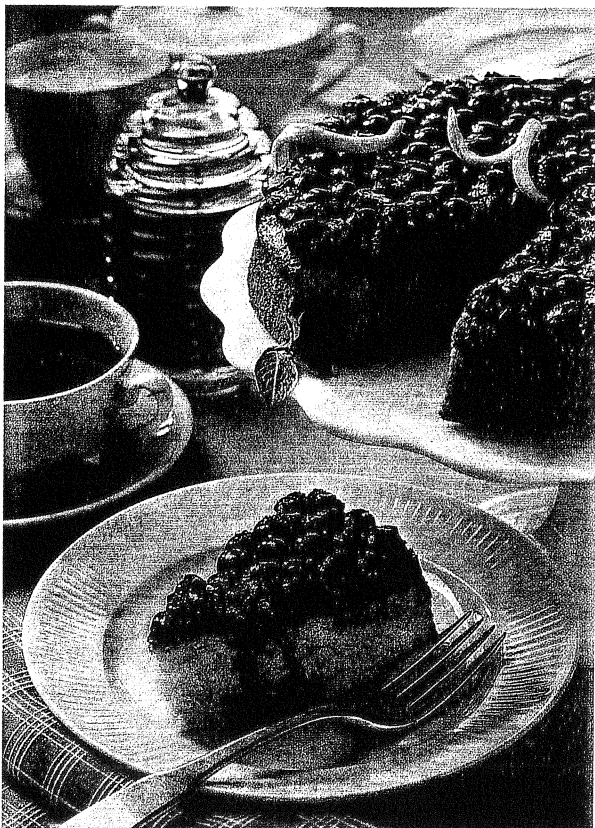
Salt

Salt adds flavor to many baked products. In yeast breads, salt also regulates the action of the yeast and inhibits the action of certain enzymes. If yeast dough contains no salt, the yeast will produce carbon dioxide too quickly. The bread dough will be difficult to handle, and the baked product will have a poor appearance.

Adjusting Ingredients

You can follow a few simple guidelines to adjust quick bread and yeast bread recipes to make them more healthful. For instance, you can substitute fat free milk for whole milk in bread recipes. This change will reduce fat in each serving of bread products. Also, some recipes call for more baking powder, fat, eggs, sugar, and salt than are really needed. Cutting down on these ingredients will result in breads that are lower in calories, fat, and sodium, 23-3. Such changes are in line with the Dietary Guidelines for Americans. A recipe for corn muffins has been modified in 23-4.

Adjusting bread recipes can help you increase your intake of fruits, vegetables, and whole grains. Try adding blueberries or sliced bananas to pancakes to add fruit to your diet. Stir some shredded zucchini or carrots into muffin batter to help meet your needs from the vegetable group. To increase whole grains in your diet, replace half the all-purpose flour in recipes with whole wheat flour or ground



National Honey Board

23-2 The alkaline baking soda in this coffee cake is neutralized by honey and lemon juice.

Minimum Ingredient Proportions per 1 Cup (250 mL) of Flour					
Product	Fat	Eggs	Sugar	Salt	Baking Powder
Biscuits	2 tablespoons (30 mL)	—	—	1/4 teaspoon (1 mL)	1 1/4 teaspoons (6 mL)
Muffins	2 tablespoons (30 mL)	1/2	1 tablespoon* (15 mL)	1/4 teaspoon (1 mL)	1 1/4 teaspoons (6 mL)
Popovers	1 tablespoon (15 mL)	2	—	1/4 teaspoon (1 mL)	—
Cream puffs	1/2 cup (125 mL)	4	—	1/4 teaspoon (1 mL)	—
Traditional yeast breads	1 tablespoon* (15 mL)	1/2*	1 teaspoon* (5 mL)	1/4 teaspoon (1 mL)	—
Bread machine yeast breads	2 teaspoons (10 mL)	*	1 tablespoon (15 mL)	1/2 teaspoon (2 mL)	—

*Many traditional yeast breads can be made without any fat or eggs. When recipes for richer breads call for these ingredients, the minimums shown here will produce a suitably rich dough. Sugar is not an essential ingredient in traditional unsweetened yeast breads. However, most recipes call for a small amount to serve as food for the yeast. Fat and sugar are not optional ingredients in yeast breads prepared in bread machines. Adding an egg and decreasing other liquids by 1/4 cup (50 mL) will improve structure and volume of whole grain bread machine recipes.

23-3 Following these proportions will reduce the sugar, fat, and sodium in many quick bread and yeast bread recipes.

oatmeal. Count these ingredients as flour when figuring proportions of ingredients. However, these flours are heavier and may require a little extra baking powder for proper leavening.

Food Science Principles of Preparing Quick Breads

You can see food science principles at work in quick breads in the development of gluten. **Gluten** is a protein that gives strength and elasticity to batters and doughs and structure to baked products. It also holds the leavening gases, which are what make quick breads rise. Gluten is created by the proteins *gliadin* and *glutenin*, which are found in wheat flour. When you combine wheat flour with liquid and stir or knead the mixture, the glutenin and gliadin form gluten.

To understand gluten, think of a piece of bubble gum. When you first put the gum in your mouth, it is soft and easy to chew. As you chew the gum, it becomes more elastic, and you can blow bubbles. As you continue to chew the gum

for a long time, it becomes so elastic it makes your jaws hurt.

Gluten behaves in a similar way. If you mix or handle a batter or dough too much, the gluten will overdevelop. This can cause a quick bread to be compact and tough. To keep quick breads light and tender, mix them for only a short time and handle them carefully.

Each kind of white wheat flour contains different amounts of gliadin and glutenin. Thus, the strength of the gluten produced by each of the flours differs. Do not replace more than half the all-purpose flour with whole grain flour when adjusting recipes. Otherwise, you may not have the right amount of gluten for the product you are preparing. Yeast breads need a strong gluten structure. Cakes should have a delicate structure. Most quick breads fall somewhere in between.

Another way food science principles are at work in quick breads is in chemical reactions that produce leavening gases. Baking soda is an alkali. When combined with a food acid ingredient, baking soda releases carbon dioxide. Acid ingredients also help neutralize the batter, which would otherwise have a bitter flavor and disagreeable color.

Recipe Comparison	
Traditional Corn Muffins (Makes 12 muffins)	Light Corn Muffins (Makes 12 muffins)
1 cup flour	1 cup flour
1 cup cornmeal	1 cup cornmeal
1/4 cup sugar	2 tablespoons sugar
1 teaspoon salt	1/2 teaspoon salt
4 teaspoons baking powder	1 tablespoon baking powder
1 egg	1 egg
1 cup milk	1 cup fat free milk
1/3 cup shortening	1/4 cup shortening

23-4 Adjusting ingredient proportions in this traditional recipe can save 25 calories, 2 grams of fat, and 115 mg of sodium per muffin.

Most baking powders are *double-acting baking powders*. They release some of their carbon dioxide when they are moistened. However, they release most of their carbon dioxide when they are heated.

Preparing Biscuits

The method used to mix baked products is another factor that distinguishes one baked product from another. When preparing biscuits, combine the ingredients using the *biscuit method*. This method involves sifting dry ingredients together into a mixing bowl. Use a pastry blender or two knives to cut the fat into the dry mixture. Continue cutting in until the particles are the size of coarse cornmeal. Then add the liquid all at once and stir until the dough forms a ball. This is the same mixing method you will use when making pastry.

The dry ingredients in biscuits are flour, baking powder, and salt. You can also use self-rising flour, which is a mixture of these three ingredients. The liquid in biscuits is milk or buttermilk. Drop biscuits contain a higher proportion of liquid than rolled biscuits. You drop the batter for *drop biscuits* from a spoon onto a greased baking sheet. You gently knead the dough for *rolled biscuits* 8 to 10 times and roll or pat it into a circle. Cut the dough with a biscuit cutter and place the biscuits on an ungreased baking sheet. Bake both types of biscuits in a hot oven until they are golden brown.

Characteristics of Biscuits

A high-quality rolled biscuit has an even shape with a smooth, level top and straight

sides. The crust is an even brown. When you break it open, the *crumb*, or soft interior, is white to creamy white. It is moist and fluffy and peels off in layers. See 23-5.

Biscuits require gentle handling. An under-mixed biscuit has a low volume and a rounded top with a slightly rough crust. The crumb is tender. An overmixed biscuit also has a low volume and a rounded top, but the top is smooth. The crumb is tough and compact.

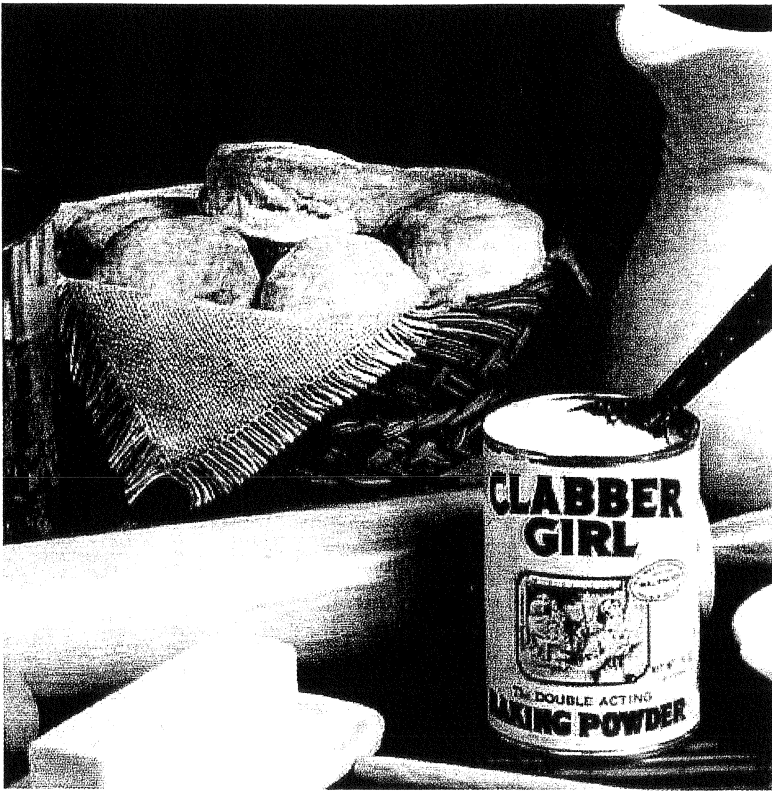
Preparing Muffins

When preparing muffins, combine ingredients using the *muffin method*. For this method, measure the dry ingredients into a mixing bowl. Make a well in the center of the dry ingredients. In a separate bowl, combine beaten eggs with milk and oil or melted fat. Pour all the liquid mixture into the well in the dry ingredients. For muffins, stir the batter just until the dry ingredients are moistened. You will also use this mixing method when preparing waffles, pancakes, popovers, and some coffee cakes. Batter for some of these baked products may require more stirring than the batter for muffins.

The dry ingredients in muffins are flour, baking powder, salt, and sugar. Fruits, nuts, cheese, and other ingredients may be added to muffin batter for variety. After combining ingredients, drop muffin batter into a greased muffin pan and bake.

Characteristics of Muffins

A high-quality muffin has a thin, evenly browned crust. The top is symmetrical, but it looks rough. When broken apart, the texture is uniform, and the crumb is tender and light.



Clabber Girl Corporation

23-5 Light, golden rolled biscuits should have a uniform appearance.

An undermixed muffin has a low volume and a flat top. The crumb is coarse. An overmixed muffin has a peaked top and a pale, slick crust. When broken apart, narrow, open areas called *tunnels* are visible.

Preparing Popovers

Popovers look like golden brown balloons. You can eat them with jam or fill their hollow centers with mixtures of meat, poultry, seafood, and/or vegetables. A variety of sweet fillings, such as ice cream, pudding, fruit, and custard, are also popular in popovers.

Popovers contain flour, salt, eggs, milk, and a small amount of fat. Use the muffin method to combine these ingredients. Then place popovers in a hot oven for the first part of the baking period. This allows steam to expand the walls of the popovers. Following this expansion, lower the temperature to prevent overbrowning before the interior has set. Do not open the oven door to check popovers during baking. If you do and they have not set, the steam can condense and cause the popovers to collapse.

Characteristics of Popovers

A high-quality popover has good volume. The shell is golden brown and crisp, and the interior contains slightly moist (but not raw) strands of dough. See 23-6.

Insufficient baking is one of the biggest causes of popover failures. If you have not baked a popover long enough, it will collapse when you take it from the oven. The exterior will be soft instead of crisp, and the interior will be doughy.

Preparing Cream Puffs

A cream puff is a golden brown, hollow shell with crisp walls. You can fill cream puffs with pudding, custard, ice cream, fruit, or whipped cream and serve them as a dessert. You can fill them with creamed meat, poultry, or fish and serve them as a main dish. You can also fill small cream puffs with cream cheese, shrimp salad, or another light filling and serve them as appetizers. Elongated cream puffs filled with custard are called *eclairs*.

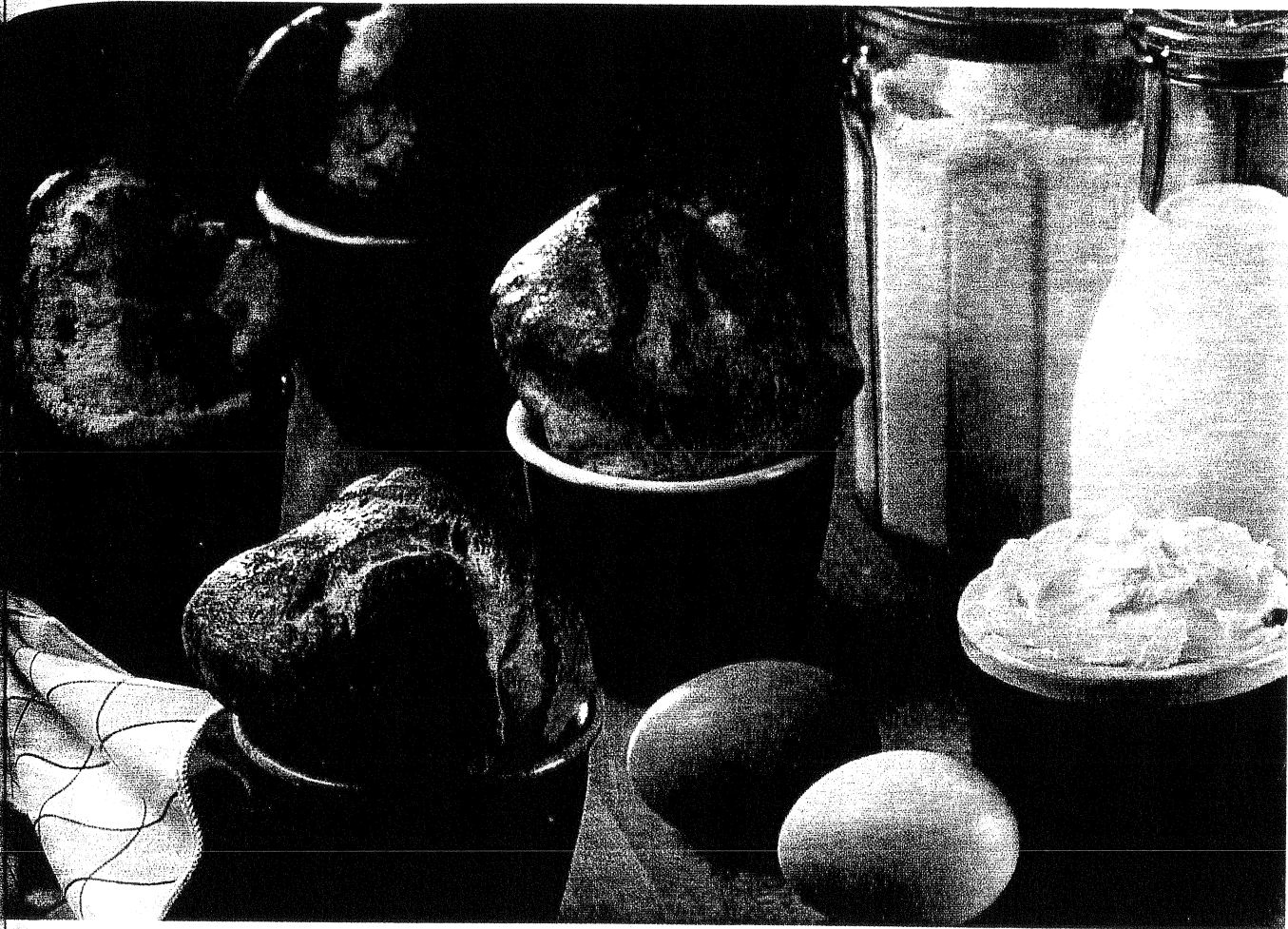
Cream puffs are made from water, fat, flour, and eggs. They require a special mixing method. Begin by bringing the water and fat to a boil. Then add the flour and stir vigorously over low heat until the mixture forms a ball. After removing the mixture from the heat, stir in the eggs until the mixture is smooth. The resulting dough is called *puff paste*.

Drop the puff paste onto an ungreased baking sheet. Begin baking the cream puffs in a hot oven so the steam will cause them to puff (rise). Then reduce the temperature. This will prevent the exteriors of the cream puffs from overbrowning before the interiors have set. Do not open the oven door to check the cream puffs during baking. If you do and the cream puffs have not set, the steam can condense and cause them to collapse.

Characteristics of Cream Puffs

A properly prepared cream puff has a good volume and a brown, tender crust. When broken apart, the interior of the cream puff is hollow. A few strands of moist, tender dough may be visible.

Cream puff failures usually are the result of underbaking. When you take an underbaked cream puff from the oven, it will collapse. The interior is moist and filled with strands of dough.



American Egg Board

23-6 High-quality popovers look like golden brown balloons on the outside.

Occasionally, cream puffs will ooze fat during baking. The evaporation of too much liquid can cause this. Evaporation may take place when the water and fat are heated together or when the puff paste is cooked.

Microwaving Quick Breads

You can use the microwave oven to prepare a variety of tasty quick breads in a matter of minutes. Nut breads, muffins, coffee cakes, corn bread, and biscuits all microwave beautifully. You can reheat frozen waffles and pancakes in a microwave oven, too. However, popovers and cream puffs do not microwave well due to the lack of dry heat needed for crust formation.

Many microwave quick bread recipes use baking mixes and refrigerated biscuits for added speed and convenience. You can use a variety

of tasty toppings to disguise the lack of browning on these products.

Quick breads will microwave more evenly in ring-shaped pans or muffin rings. A round casserole with a juice glass placed in the center will serve as a ring-shaped pan. Custard cups arranged in a circle can take the place of a muffin ring.



Yeast Breads

Homemade yeast bread is decidedly different from commercially prepared sandwich breads. It has a distinctively appealing sweet smell and delicious taste that cannot be matched, 23-7.

Many meal managers rely on the ease of bread machines to make homemade bread an option in their menu plans. All a meal manager

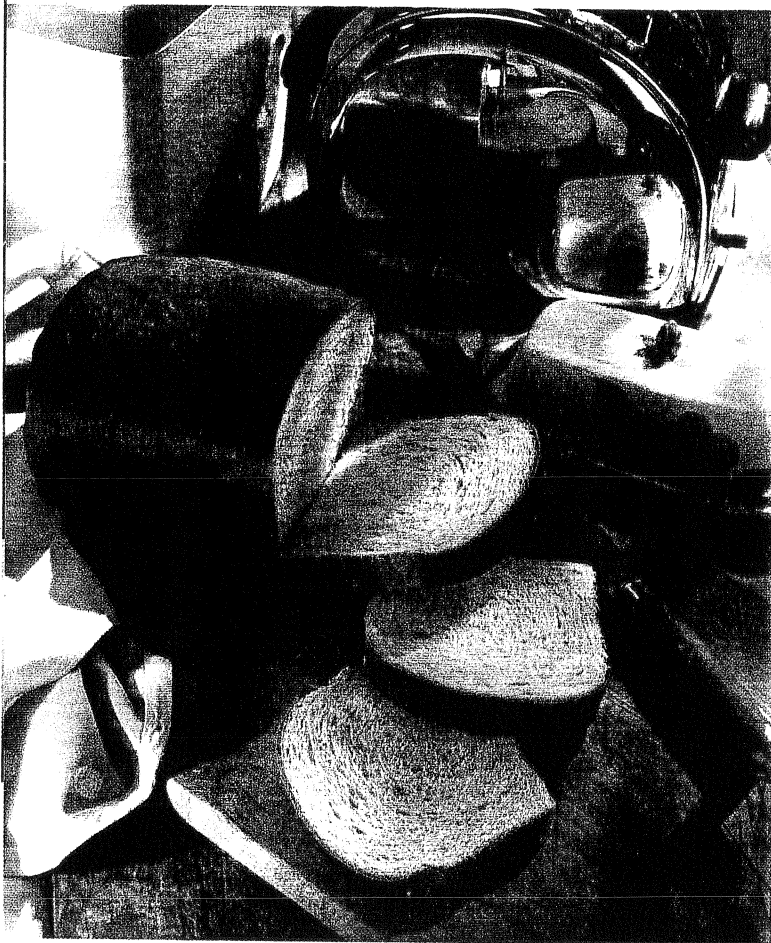


photo courtesy of Fleischmann's Yeast

23-7 The flavor, texture, and aroma of homemade yeast bread create a feast for the senses.

has to do is measure the ingredients, and the bread machine does the rest. Even without the convenience of this appliance, however, you can serve homemade breads. Try recipes for brown-and-serve breads and cool-rise and frozen doughs. These recipes allow you to take advantage of time you have available to prepare products you can bake later.

Yeast Bread Ingredients

All yeast breads must contain flour, liquid, salt, and yeast. Most recipes call for a small amount of sugar, and some include fat and eggs. Proportions of ingredients vary somewhat between traditional yeast breads and those prepared in bread machines.

Flour

You can use all-purpose flour for making traditional yeast breads. When mixed with liquid

and kneaded, the flour develops gluten to support the carbon dioxide produced by the yeast.

Bread flour contains larger amounts of gliadin and glutenin than all-purpose flour. It produces the strongest and most elastic gluten of all the white wheat flours. Bread flour is recommended when preparing breads in a bread machine. This is because the actions of a bread machine require stronger gluten.

Whole wheat and nonwheat flours, such as rye, soy, corn, and oat, have a lower protein content than all-purpose flour. They will produce a denser loaf than all-purpose or bread flour. Many recipes calling for whole grain flours also call for some all-purpose or bread flour. Such a combination is essential when preparing products in a bread machine. The combination of flours will produce more gluten and help bread rise. Traditional recipes may suggest equal parts of all-purpose and whole grain flours. A ratio of two parts bread flour to one part whole grain flour is recommended for bread machines.

Liquid

You can use plain water, potato water, or milk as the liquid in yeast breads. Milk produces a softer crust and helps breads stay fresh longer than water. Other options for liquid ingredients in yeast breads include buttermilk, fruit juices, yogurt, applesauce, and cottage cheese. These options add nutrients and distinctive flavors.

The temperature of the liquids affects yeast cells. You need to warm liquids used in traditional yeast breads. Your recipe will tell you the temperature to which liquids should be heated. Temperatures that are too high kill the yeast cells. Temperatures that are too low can slow or stop yeast activity. When preparing breads in a bread machine, liquids should be near room temperature, 75°F to 85°F (24°C to 29°C). Using liquids that are too warm may keep yeast breads prepared in a bread machine from rising.

Salt

Salt regulates the action of the yeast and inhibits the action of certain enzymes in the flour. Bread machine recipes require a higher proportion of salt than traditional recipes. Without salt, a traditional yeast dough is sticky and hard to handle. When baked, the bread may look moth-eaten. Omitting salt from a bread machine recipe may cause the top of the loaf to collapse.

Yeast

Yeast is a microscopic, single-celled plant used as a leavening agent in yeast breads. It is available in three forms.

Compressed yeast is made from fresh, moist yeast cells that are

pressed into cakes. You must refrigerate compressed yeast because it is very perishable.

Active dry yeast is made from an active yeast strain that has been dried and made into granules. *Fast-rising yeast* products are highly active yeast strains. The granules of these products are smaller than those of active dry yeast, which allows them to act more quickly. Active dry and fast-rising yeast are both available in small foil packets and glass jars. Store these yeast products in a cool, dry place and refrigerate jars after opening. For fastest action, buy yeast in small quantities and use it promptly. See 23-8.

For best results, use the amount of yeast specified in your recipe. A general guideline is $\frac{3}{4}$ teaspoon (3 mL) active dry yeast or $\frac{1}{2}$ teaspoon (2 mL) fast-rising yeast per cup of flour. Using too much yeast will cause the dough to rise too quickly. Excess yeast will also give the bread an undesirable flavor, texture, and appearance. Using too little yeast will lengthen the rising time.

Sugar

Sugar, brown sugar, honey, and molasses can all be used in yeast bread recipes. These ingredients influence browning, flavor, and

Good Manners Are Good Business

You can use a piece of bread to help you push a bite of food onto your fork at a business meal. However, avoid using your bread to wipe your plate clean.

texture. They also provide extra food for the yeast so the dough will rise faster. If you use too much sugar, however, the yeast will work more slowly.

Bread machine recipes require a higher proportion of sugar than

traditional recipes. In a bread machine, too much sugar can keep bread from rising. Even the sugar contributed by dried fruits can have this effect. Some bread machines have a special cycle for sweet breads. This cycle is designed to produce high-quality products when using recipes with a high sugar content.

Fat

Fat increases tenderness of yeast breads. Fat is optional in some traditional recipes, but it is required in bread machine recipes. Most recipes call for solid fat, but some call for oil.

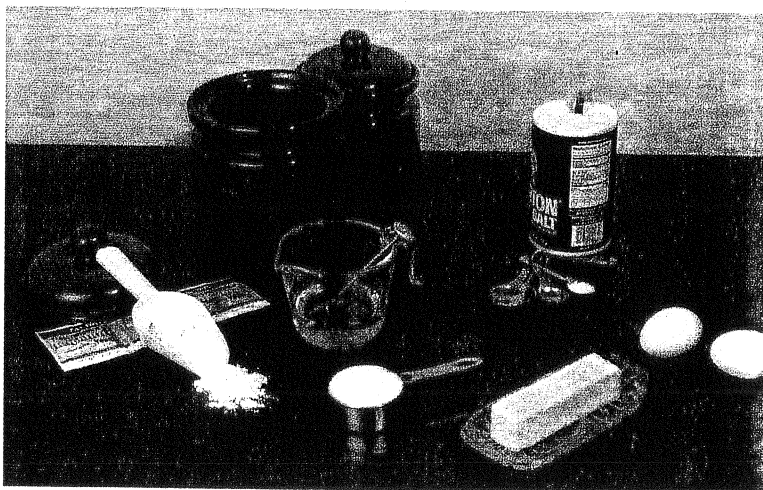
Eggs

Eggs add flavor and richness to yeast breads. They also add color and improve the structure.

You may wish to add an egg to a bread machine recipe calling for whole grain flour. This will help improve the structure and volume of the finished product. Eggs are considered part of the liquid in yeast bread recipes. Therefore,

Q: If I want more fiber in my diet, shouldn't I eat brown bread instead of white bread?

A: Use the Nutrition Facts panel and the ingredients list rather than color to find bread that is higher in fiber. In some bread, brown coloring comes from food dyes not high-fiber, whole grain ingredients.



Jack Klasey

23-8 In addition to yeast, basic yeast bread ingredients include flour, liquid, salt, sugar, fat, and eggs.

when adding an egg not listed in the recipe, decrease the amount of other liquid ingredients by $\frac{1}{4}$ cup (50 mL).

Other Ingredients

You may add other ingredients, such as raisins, nuts, cheese, herbs, and spices, to bread dough. They add flavor and variety. However, these ingredients tend to lengthen the rising time.

Mixing Methods for Yeast Breads

You will use the traditional, one-rise, mixer, or batter method when mixing yeast dough. Your recipe will tell you which method to use.

Traditional Method

For the *traditional method*, dissolve the yeast in a small amount of warm water. The water should be 105°F to 115°F (41°C to 46°C). Then add remaining liquid, sugar, fat, salt, and some of the flour. Like the water used to

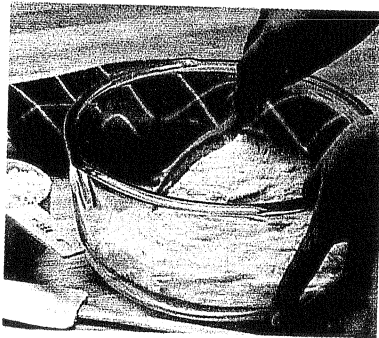
dissolve the yeast, remaining liquid should be 105°F to 115°F (41°C to 46°C). Cold liquid will slow the rising action when added to activated yeast. If the recipe calls for eggs, stir them in before adding the remaining flour to form a soft dough.

Doughs prepared by the traditional method are allowed to rise twice. The first rising takes place after you mix the ingredients. Then you shape the dough and allow it to rise a second time. See 23-9.

One-Rise Method

The *one-rise method* requires the use of fast-rising yeast. Mix the yeast with some of the flour and all the other dry ingredients. Heat the liquid and fat together to a temperature of 120°F to 130°F (49°C to 54°C). Add the warmed liquids to the dry ingredients. If eggs are required, add them before adding the remaining flour to form a soft dough.

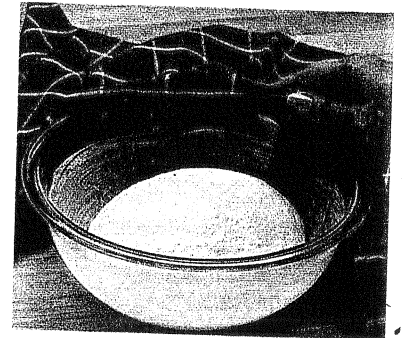
After combining the ingredients, you may knead the dough. Then cover it and allow it to rest for 10 minutes. This resting period replaces



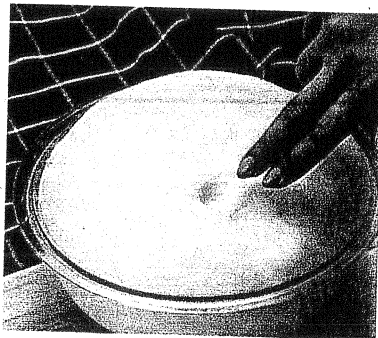
A—Combine ingredients and beat until smooth. Stir in enough additional flour to make a moderately stiff dough.



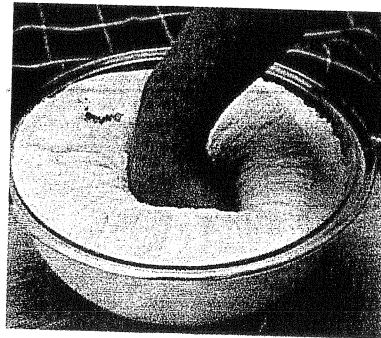
B—On a lightly floured pastry board or cloth, knead dough until smooth and elastic.



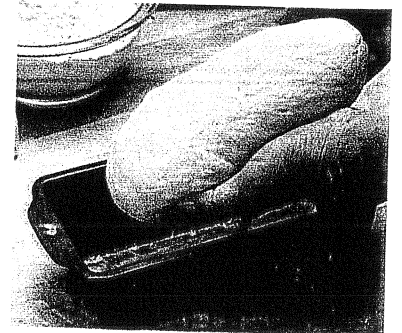
C—Place dough in a lightly greased bowl; turn once to grease top.



D—Let dough rise in a warm place until double in bulk. Test dough for lightness with two fingers.



E—When dough is light, punch down.



F—Shape dough into loaves or rolls. Allow the dough to rise a second time, then bake as directed.

23-9 To prepare yeast bread by the traditional method, follow these easy steps.

photo courtesy of Fleischmann's Yeast

the first rising required in the traditional method. After resting, shape the dough and allow it to rise before baking.

Mixer Method

The *mixer method* works well with active dry or fast-rising yeast. Like the one-rise method, begin by mixing the yeast with some of the flour and all the other dry ingredients. Heat the liquid and fat together to a temperature of 120°F to 130°F (49°C to 54°C). Using an electric mixer, add the warmed liquids to the dry ingredients. Add eggs if required. Then stir in the remaining flour with a spoon to form a soft dough. This method allows ingredients to blend easily. Using the mixer helps develop gluten and, therefore, shortens the kneading time.

Batter Method

Some recipes use the *batter or no-knead method*. These recipes use less flour, so the yeast mixture is thinner than dough. Vigorous stirring, rather than kneading, helps develop the gluten. Batter recipes that require two risings rise first in the mixing bowl. Then you spread the batter in a pan for the second rising before baking.

Food Science Principles of Preparing Yeast Breads

Like preparing quick breads, preparing yeast breads requires the development of gluten and the formation of carbon dioxide. During mixing and kneading, the gluten develops. The gluten will form the framework of the bread. It will trap the carbon dioxide produced by the yeast as the dough rises. As the amount of carbon dioxide increases, the dough will rise, giving volume to the bread. The preparation of successful yeast bread depends on careful measuring, sufficient kneading, and controlled fermentation temperatures. Correct pan size and baking temperature are also important.

Kneading

After forming yeast dough by the traditional, one-rise, or mixer method, you must knead it. Although some of the gluten develops during initial beating, kneading develops most of the gluten. To knead, press the dough with the heels of the hands, fold it, and turn it. You must rhythmically repeat this motion until the dough is smooth and elastic. See 23-10.

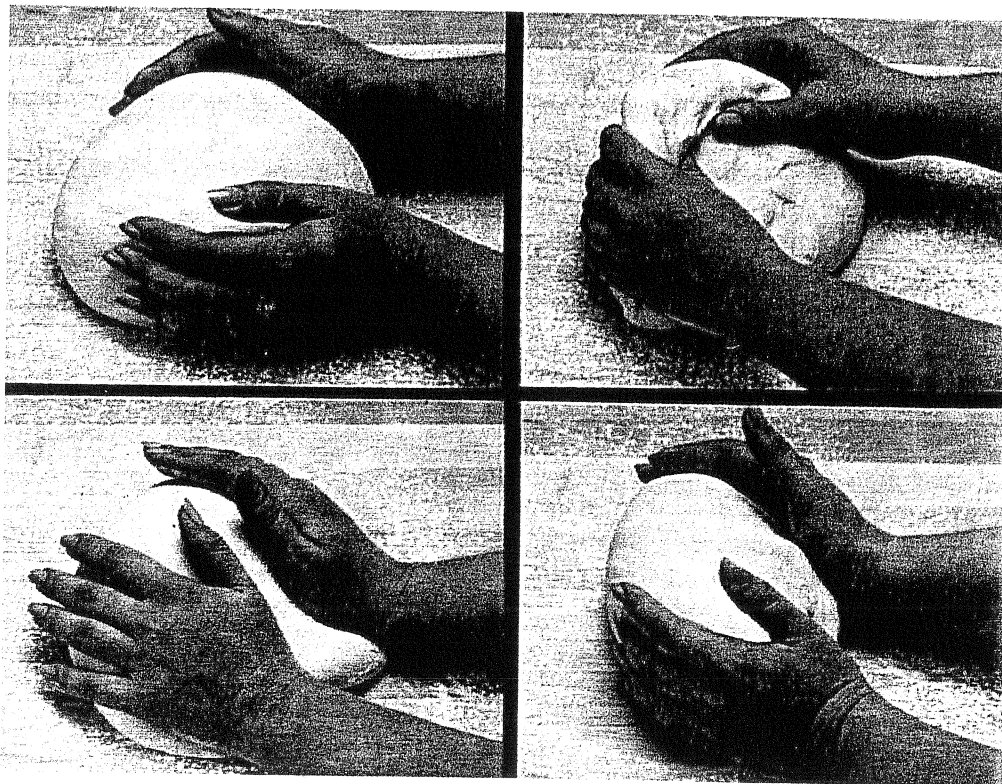


photo courtesy of Fleischmann's Yeast

23-10 To knead dough, use your fingers to fold it in half toward your body. With the heels of your hands, push against the dough and turn it one-quarter turn.

Avoid adding too much extra flour when kneading the dough. Too much flour will make the dough stiff. It is also important not to be too rough with the dough. Too much pressure at the beginning of kneading can keep the dough sticky and hard to handle. Too much pressure toward the end of kneading can tear or mat the gluten strands that have already developed.

Fermentation

After kneading yeast dough, you must allow it to rest in a warm place. During this resting time, the yeast acts on the sugars in the bread dough to form alcohol and carbon dioxide. This process is called **fermentation**. The alcohol evaporates during baking. The carbon dioxide causes the bread to rise.

The dough should at least double in volume during fermentation. To see if dough has doubled in size, gently push two fingers into the dough. If an indentation remains, the dough has risen enough.

Fermentation time varies depending on the kind and amount of yeast, the temperature of the room, and the kind of flour. Breads made with fast-rising yeast rise up to 50 percent faster than products made with regular yeast. The dough should be kept in a warm place for optimal fermentation. The temperature range of 80°F to 85°F (27°C to 29°C) is ideal for the production of carbon dioxide by the yeast. You can create such a warm environment by placing the bowl of dough over a pan of steaming water. Avoid temperatures that are too warm, which will cause the yeast to work too quickly, causing the dough to rise too fast.

Punching the Dough

When the dough is light (has completed the first rising), you must punch it down to release some of the carbon dioxide. Punch dough down by firmly pushing a fist into the dough. Then fold the edges of the dough toward the center, and turn the dough over so the smooth side is on top. At this point, some doughs require a second rising time. (Doughs made with bread flour need a second rising.)

Shaping

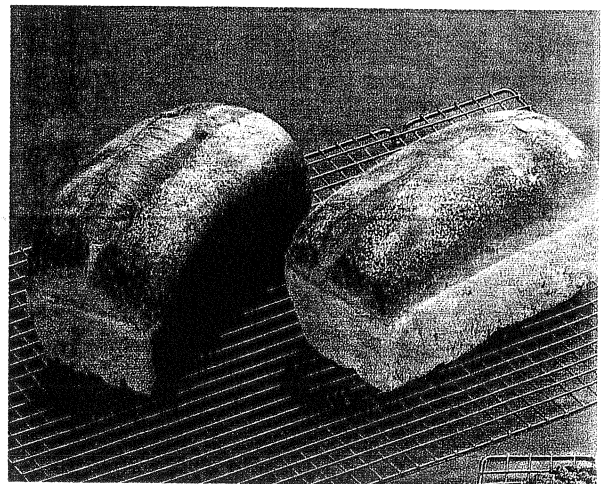
After punching the dough down, use a sharp knife to divide it into portions as the recipe directs. Allow the divided dough to rest about 10 minutes. After resting, the dough will be easier to handle and shape as desired.

To shape yeast dough, first flatten the dough into a rectangle. The width of the dough should be about the length of the bread pan. Using a rolling pin will help you to work out any large air bubbles. Fold the ends of the rectangle to the center, overlapping them a little. This should give you a smaller rectangle. Use your rolling pin to flatten the rectangle into a square. Roll the dough into a cylinder. Pinch the edge of the dough into the roll to seal it. Seal each end of the roll by pressing down on it with the side of your hand. Fold the ends under. Place the shaped dough, seam side down, in a greased loaf pan. Brush the top with melted shortening, if desired. Cover the loaf with a clean towel, and shape the remaining dough. Let the loaves rise in a warm, draft-free place until they have doubled in bulk.

Baking

Baking times and temperatures vary somewhat depending on the kind of dough and size of the loaf. Place most yeast breads in a moderately hot oven. During baking, the gas cells formed during fermentation expand. The walls of dough around these cells set and become rigid. During the first few minutes of baking, the dough will rise dramatically. This rapid rising is called *oven spring*.

After baking, immediately remove bread from the pans and place it on cooling racks. Cool the bread thoroughly before you slice and store it, 23-11.



Baker's Secret

23-11 Using a cooling rack will keep the bottom of yeast bread from getting soggy due to trapped steam.

Characteristics of Yeast Bread

A high-quality loaf of yeast bread has a large volume and a smooth, rounded top. The surface is golden brown. When sliced, the texture is fine and uniform. The crumb is tender and elastic, and it springs back when touched.

If yeast dough has been under- or over-worked, the finished product will have a low volume. This is because carbon dioxide has leaked out of the dough.

If you allow bread to rise for too long a time before baking, it may have large, overexpanded cells. The top of the loaf may be sunken with overhanging sides, much like a mushroom. The texture is coarse, and it may be crumbly.

If you have not allowed bread to rise long enough before baking, it may have large cracks on the sides of the loaf. Its texture is compact.

Timesaving Yeast Bread Techniques

Bread making no longer has to be the all-day task it once was. Fast-rising yeast can cut rising time in half. Using the one-rise mixing method saves rising time. The mixer method speeds the blending of ingredients and shortens kneading time. The batter method eliminates kneading entirely.

Besides timesaving ingredients and mixing methods, some recipes allow you to fit bread making conveniently into your schedule. These include recipes for cool-rise, refrigerator, and freezer doughs. Of course, a bread machine is the ultimate time-saver.

Cool-Rise Doughs

Cool-rise doughs are prepared from recipes that are specially designed to rise slowly in the refrigerator. You mix ingredients and knead the dough. Then after a brief rest, you shape the dough and place it in a pan. You cover the dough and place it in the refrigerator. The dough will rise and be ready to bake at your convenience any time from 2 to 24 hours later.

Refrigerator Doughs

Like cool-rise doughs, *refrigerator doughs* are prepared from recipes that are specially designed to rise slowly in the refrigerator. The batter method is often used to prepare these doughs. Therefore, they are not kneaded like cool-rise doughs. Refrigerator doughs are also

shaped after, rather than before refrigeration. Refrigerator doughs can usually remain in the refrigerator for 2 to 24 hours. Then you shape the dough, let it rise, and bake it.

Freezer Doughs

Another type of specially formulated yeast bread recipe is for *freezer doughs*. These recipes allow you to mix and knead dough. Then you can freeze the dough before or after shaping. Store dough in the freezer for up to one month. When you are ready to eat it, simply thaw, shape if necessary, let rise, and bake.

Q: Isn't bread fattening?

A: Bread provides mostly complex carbohydrates, which supply 4 calories per gram, or about 70 calories for the average slice. If you're worried about calories, go easy on high-fat spreads, such as butter and margarine.

Bread Machines

Few people would argue that bread machines are the fastest, easiest way to produce homemade bread. However, these marvelous appliances are not foolproof. Each machine model behaves a bit differently. The best way to ensure success when using your machine is to carefully follow the manufacturer's directions. See 23-12.

The consistency of the dough in a bread machine indicates the quality of the bread that will result. You can check the texture of the dough by opening the machine's lid partway through the first knead cycle. The dough should form a soft ball that is somewhat sticky to the touch. If the dough is too moist, the loaf will collapse during baking. To correct this, add bread flour 1 tablespoon (15 mL) at a time. If the dough is not moist enough, it may produce a small, compact loaf. To correct this, add liquid 1 tablespoon (15 mL) at a time.

Weather conditions can have an effect on dough prepared in a bread machine. Therefore,



23-12 A bread machine simplifies the process of making yeast bread at home.

Oster

a recipe may produce satisfactory results one time and unsatisfactory results another time. For advice on specific problems with your bread machine, use the toll-free consumer information number provided by the manufacturer. Your county extension agent may also be able to offer suggestions related to your specific situation.

Microwaving Yeast Breads

You may be able to use a microwave oven to help you with some steps in yeast bread preparation. For instance, you can defrost frozen bread dough in a microwave oven. Start by microwaving 1 cup (250 mL) of water for 3 to 5 minutes on high power until boiling. This creates a warm, moist atmosphere for the dough. Then place the frozen dough in a greased, microwavable loaf pan. Microwave on the defrost setting for 3 minutes. Turn dough over and rotate the pan. Microwave on defrost for another 3 minutes until the dough is soft to the touch. Allow the dough to stand for 5 minutes to become pliable.

You can raise dough in a microwave oven by placing the dough in a greased bowl. Turn the dough to grease all sides. Cover the bowl with waxed paper and place it in a dish of warm water. Microwave on low power for 1 minute. Let the dough stand in the oven for 15 minutes. Rotate the dish one-quarter turn. Repeat the microwaving, standing, and rotating process as needed until the dough is doubled in size.

Some recipes are even designed to be baked in a microwave. However, the resulting loaves will lack the crisp, brown crusts of conventionally baked breads. Batter breads work especially well in a microwave oven because they do not have crusts. Raised coffee rings with toppings and dark breads also microwave well because they do not show the lack of browning.

Bread baked in a microwave oven is microwaved on medium power until it is almost done. Complete the last few minutes of microwaving on high power until bread is no longer doughy. You may place bread in a preheated conventional oven for a final few minutes to brown the crust.

Yeast Bread Variations

Add variety to yeast bread by combining white flour with whole wheat flour, rye flour, or cornmeal. Try adding dried fruits, nuts, herbs, or cheese to the basic dough. Brush the tops of the loaves with butter and sprinkle them with poppy, sesame, or caraway seeds.

You can shape basic bread dough into rolls. After punching the dough down, allow it to rest for a short time. Then divide it into portions and shape it into rolls. Crescent rolls, cloverleaf rolls, Parker House rolls, fan tans, and bows are popular roll shapes. You can find directions for shaping rolls in many cookbooks. See 23-13.



photo courtesy of Fleischmann's Yeast

23-13 Fruit filling and a fancy shape turn ordinary yeast dough into a festive coffee cake.



UNDERSTANDING YEAST PRODUCTS

YEAST PRODUCT TYPES

Although all yeast doughs are made according to essentially the same basic principles, it is useful to divide yeast products into categories such as the following.

REGULAR YEAST DOUGH PRODUCTS

After reading this chapter, you should be able to

1. Prepare breads and dinner rolls.
2. Prepare sweet dough products.
3. Prepare Danish pastry and croissants.

Lean Dough Products

A lean dough is one that is low in fat and sugar.

- Hard-crust breads and rolls, including French and Italian breads, kaiser rolls and other hard rolls, and pizza. These are the leanest of all bread products.
- Other white breads and dinner rolls. These have a higher fat and sugar content and, sometimes, also contain eggs and milk solids. Because they are slightly richer, they generally have soft crusts.
- Whole-grain breads. Whole wheat and rye breads are the most common. Many varieties of rye bread are produced with light or dark flours or with pumpernickel flour and with various flavorings, especially molasses and caraway seeds.

Rich Dough Products

There is no exact dividing line between rich and lean doughs but, in general, rich doughs contain higher proportions of fat, sugar, and, sometimes, eggs.

- Nonsweet breads and rolls, including rich dinner rolls and brioche. These have a high fat content but low enough sugar that they can be served as dinner breads. Brioche dough is especially rich, made with a high proportion of butter and eggs.
- Sweet rolls, including coffee cakes and many breakfast and tea rolls. These have high fat and sugar and, often, eggs. They are usually made with a sweet filling or topping.

ROLLED-IN YEAST DOUGH PRODUCTS

Rolled-in doughs are those in which a fat is incorporated into the dough in many layers by means of a rolling and folding procedure. The alternating layers of fat and dough give the baked product a flaky texture.

- Nonsweet rolled-in doughs: croissants.
- Sweet rolled-in doughs: Danish pastry.

MIXING METHODS

Mixing yeast doughs has three main purposes:

1. To combine all ingredients into a uniform, smooth dough.
2. To distribute the yeast evenly throughout the dough.
3. To develop gluten.

Three principal mixing methods are used for yeast doughs: the straight dough method, the modified straight dough method, and the sponge method.

STRAIGHT DOUGH METHOD

There is only one step in this method, as practiced by many bakers.

Some bakers dissolve the compressed yeast in some of the water before adding the remaining ingredients. Others omit this step. Active dry yeast, on the other hand, must be rehydrated before mixing.

The advantage of softening the yeast in water is that it helps ensure that the yeast is evenly distributed in the dough.

Procedure: Straight Dough Mixing Method

Combine all ingredients in the mixing bowl and mix.

MODIFIED STRAIGHT DOUGH METHOD FOR RICH DOUGHS

For rich sweet doughs, the method is modified to ensure even distribution of the fat and sugar.

Procedure: Modified Straight Dough Method

Soften the yeast in part of the water.

Combine the fat, sugar, salt, milk solids, and flavorings and mix until well combined, but do not whip until light.

Add the eggs gradually, as fast as they are absorbed.

Add the liquid and mix briefly.

Add the flour and yeast. Mix into a smooth dough.

Procedure: Sponge Method

SPONGE METHOD

Sponge doughs are prepared in two stages.

1. Combine the liquid (or part of the liquid), the yeast, and part of the flour (and, sometimes, part of the sugar). Mix into a thick batter or soft dough. Let ferment until double in bulk.
2. Punch down and add the rest of the flour and remaining ingredients. Mix to a uniform, smooth dough.

STEPS IN YEAST DOUGH PRODUCTION

The production of yeast breads involves 12 basic steps. These steps are applied to yeast products in general, with variations depending on the particular product.

- | | |
|------------------------|-----------------------|
| 1. Scaling ingredients | 7. Benching |
| 2. Mixing | 8. Makeup and panning |
| 3. Fermentation | 9. Proofing |
| 4. Punching | 10. Baking |
| 5. Scaling | 11. Cooling |
| 6. Rounding | 12. Storing |

As you can see, mixing of ingredients into a dough is only one part of a complex procedure.

SCALING INGREDIENTS

All ingredients must be weighed accurately. The only items that may be measured by volume are water, milk, and eggs, which may be scaled at 1 pint per pound (or 1 liter per kilogram).

MIXING

Use the *dough arm* attachment when using a vertical mixer. Mix for the specified time.

The first two purposes of mixing—combining the ingredients into a dough and distributing the yeast—are accomplished during the first part of mixing. The remaining time is necessary to develop the gluten. Overmixed and undermixed doughs have poor volume and texture. (Review “Gluten Development,” p. 895.)

It is necessary for you to learn to tell by sight and feel when a dough is thoroughly mixed. This can be done only through experience and with the guidance of your instructor. A properly developed dough feels smooth and elastic. A lean dough should not be sticky.

Sometimes it is necessary to add a little more flour if the dough hasn't lost its stickiness after most of the mixing time has passed.

Rich doughs are generally undermixed slightly because greater tenderness is desired for these products.

Note: Mixing speeds and times given in bread formulas in this book are guidelines only. Small mixers might be damaged if they are run at too high a speed with a stiff dough. In such cases, use a lower speed and extend the mixing time as necessary. Depending on the mixer, developing a dough at first or slow speed requires about twice as much mixing time as at second speed. Follow the manufacturer's recommendations.

FERMENTATION

Fermentation is the process by which yeast acts on the sugars and starches in the dough to produce carbon dioxide gas and alcohol.

Procedure For Fermenting Yeast Doughs

1. Place the dough in a lightly oiled container and oil the surface to prevent a crust from forming. (This may not be necessary if humidity is high—about 75 percent.)
2. Cover the container lightly and let the dough rise at a temperature of about 80°F (27°C).
3. Fermentation is complete when the dough has doubled in volume. If fermentation is complete, a dent will remain after the hand is pressed into the top of the dough.

Gluten becomes smoother and more elastic during fermentation. An underfermented dough does not develop proper volume, and the texture will be coarse. A dough that ferments too long or at too high a temperature becomes sticky, hard to work, and slightly sour.

An underfermented dough is called a *young dough*. An overfermented dough is called an *old dough*.

Doughs with weak gluten, such as rye doughs and rich doughs, are usually underfermented or “taken to the bench young.”

PUNCHING

Punching is *not* hitting the dough with your fist. It is a method of deflating the dough that *expels carbon dioxide, redistributes the yeast* for further growth, *relaxes the gluten*, and *equalizes the temperature* throughout the dough.

Procedure For Punching Yeast Doughs

Pull up the dough on all sides, fold over the center, and press down. Then turn the dough upside down in the bowl.

A second fermentation and punching may or may not take place, depending on the product.

SCALING

Using a baker's scale, divide the dough into pieces of uniform weight, according to the product being made.

During scaling, allowance is made for weight loss due to evaporation of moisture in the oven. This weight loss is approximately 10 to 13 percent of the weight of the dough. Allow an extra 1½ to 2 ounces of dough for each 1 pound of baked bread, or 50 to 65 grams per 500 grams.

ROUNDING

After scaling, the pieces of dough are shaped into smooth, round balls. This procedure forms a kind of skin by stretching the gluten on the outside of the dough into a smooth layer. Rounding simplifies later shaping of the dough and also helps retain gases produced by the yeast.

Your instructor will demonstrate rounding techniques. Machines are also available that divide and round portions of dough automatically. Figure 30.1 illustrates a piece of dough being rounded by hand.

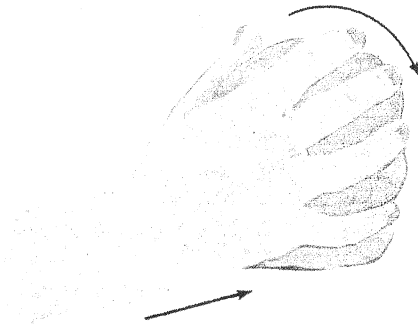


Figure 30.1

To round a piece of dough, roll the dough on the bench with the palm of your hand. As you rotate the dough, use the edge of your hand to pinch the dough against the bench. This movement stretches the surface of the dough so it is completely smooth except for a seam at the bottom where it was pinched together.

BENCHING

Rounded portions of dough are allowed to rest on the bench for 10 to 15 minutes. This relaxes the gluten to make shaping the dough easier. Also, *fermentation* continues during this time.

MAKEUP AND PANNING

The dough is shaped into loaves or rolls and placed in pans or on baking sheets. For all loaves and rolls, the seam must be centered on the bottom to avoid splitting during baking.

Breads and rolls take a great many forms. A variety of shapes and techniques is presented in the next section.

PROOFING

Proofing is a continuation of the process of yeast *fermentation*, which increases the volume of the shaped dough. Bakers use different terms so they can distinguish between fermentation of the mixed dough and proofing of the made-up product before baking. Proofing temperatures are generally higher than fermentation temperatures.

Procedure For Proofing Yeast Dough Products

Place the panned products in a proof box at 80° to 85°F (27° to 30°C) and about 70 to 80 percent humidity, as indicated in the formula. Proof until double in bulk.

If a proof box is not available, come as close to these conditions as you can by covering the products to retain moisture and setting them in a warm place.

Underproofing results in poor volume and dense texture. Overproofing results in coarse texture and some loss of flavor.

Rich doughs are slightly underproofed because their weaker gluten structure will not withstand much stretching.

BAKING

As you recall from the previous chapter, many changes take place in a dough during baking. The most important changes are these:

1. **Oven spring**, which is the rapid rising in the oven due to production and expansion of trapped gases as a result of the oven heat. The yeast is very active at first but is killed when the temperature inside the dough reaches 140°F (60°C).
2. Coagulation of proteins and gelatinization of starches. In other words, the product becomes firm and holds its shape.
3. Formation and browning of the crust.

Load the ovens carefully, as proofed doughs are fragile until they become set by baking.

Oven temperatures must be adjusted for the product being baked. Rolls spaced apart are baked at a higher temperature than large loaves so they become browned in the short time it takes to bake them. In general, lean breads such as those popular in North America are baked at 400° to 425°F (200° to 220°C), while some French breads and rolls are baked at 425° to 475°F (220° to 245°C). Rich doughs and sweet doughs are baked at a lower temperature, 350° to 400°F (175° to 200°C) because their fat, sugar, and milk content makes the crust brown faster.

Hard-crust breads are baked with steam injected into the oven during the first part of the baking period. This aids the formation of a thin, crisp crust.

Rye breads also benefit from baking with steam for the first ten minutes.

A break on the side of the loaf is caused by continued rising after the crust is formed. To allow for this final expansion, hard-crust breads are cut or scored before baking by making shallow slashes on the top of the loaf with a sharp knife or razor.

Small rolls bake completely without a break, so they are usually not scored.

Baking times vary considerably, depending on the product. A golden-brown crust color is the normal indication of doneness. Loaves that are done sound hollow when thumped.

COOLING

After baking, bread must be removed from pans and cooled rapidly on racks to allow the escape of excess moisture and alcohol created during fermentation.

Rolls baked apart from each other on sheets may be left on them because they will get adequate air circulation.

If soft crusts are desired, breads may be brushed with melted shortening before cooling.

Do not cool in a draft, or crusts may crack.

STORING

Breads to be served within eight hours may be left on racks. For longer storage, wrap cooled breads in moistureproof bags to retard staling. Bread must be thoroughly cool before wrapping, or moisture will collect inside the bags.

Wrapping and freezing maintains quality for longer periods. Refrigeration, on the other hand, increases staling.

Hard-crust breads should not be wrapped (unless frozen), or the crusts will soften.

Because of the complexity of bread production, many things can go wrong. To remedy common bread faults, check Table 30.1 for possible causes and correct your procedures.

Table 30.1
Bread Faults and Their Causes

Fault	Causes
Shape	
Poor volume	Too much salt Too little yeast Weak flour Under- or overmixing Improper fermentation or proofing Oven too hot
Too much volume	Too little salt Too much yeast Too much dough scaled Overproofing
Poor shape	Too much liquid Improper molding or makeup Improper proofing Too much steam in oven
Split or burst crust	Overmixing Underfermentation Improper molding—seam not on bottom Oven too hot Not enough steam in oven
Texture and crumb	
Too dense or close grained	Too little yeast Underproofing Too much salt Too little liquid
Too coarse or open	Too much yeast Too much liquid Incorrect mixing time Improper fermentation Overproofing Pan too large
Streaked crumb	Improper mixing procedure Poor molding or makeup techniques Too much flour used for dusting
Poor texture or crumbly	Fermentation time too long or too short Overproofing Baking temperature too low Flour too weak Too little salt
Gray crumb	Fermentation time too long or temperature too high
Crust	
Too dark	Too much sugar or milk Underfermentation (young dough) Oven temperature too high Baking time too long Insufficient steam at beginning of baking
Too pale	Too little sugar or milk Overfermentation (old dough) Overproofing Oven temperature too low Baking time too short Too much steam in oven
Too thick	Too little sugar or fat Overfermentation (old dough) Baked too long and/or at too low a temperature Too little steam
Blisters on crust	Too much liquid Improper fermentation Improper shaping of loaves
Flavor	
Flat taste	Too little salt
Poor flavor	Inferior, spoiled, or rancid ingredients Poor bakeshop sanitation Under- or overfermentation

ROLLED-IN DOUGHS: DANISH PASTRY AND CROISSANTS

Rolled-in doughs contain many layers of fat sandwiched between layers of dough. These layers create the flakiness you are familiar with in Danish pastry.

Two basic kinds of rolled-in yeast doughs are made in the bakeshop:

- sweet: Danish pastry
- nonsweet: croissants

Rolled-in doughs are mixed only slightly because the rolling-in procedure continues to develop the gluten.

Butter is the preferred fat for flavor and the melt-in-the-mouth quality of rolled-in doughs. Specially formulated shortenings are available when lower cost and greater ease of handling are more important considerations.



Danish Pastry



Ingredients	U.S.	Metric	Percentage
Milk	1 lb	400 g	40%
Yeast, fresh	2.5 oz	65 g	6.25%
Butter	5 oz	125 g	12.5%
Sugar	6 oz	150 g	15%
Salt	0.5 oz	12 g	1.25%
Cardamom	1 tsp	2 g (5 mL)	0.2%
Eggs	8 oz	200 g	20%
Egg yolks	2 oz	50 g	5%
Bread flour	2 lb	800 g	80%
Cake flour	8 oz	200 g	20%
Butter	1 lb 4 oz	500 g	50%
<i>Yield:</i>	<i>6 lb 4 oz</i>	<i>2499 g</i>	<i>250%</i>

■ Procedure

Mixing:

Modified straight dough method:

1. Scald milk. Cool to lukewarm. Dissolve yeast in milk.
2. Mix butter, sugar, salt, and spice until smooth, using paddle. Beat in eggs and yolks.
3. Add liquid (from step 1) and flour. With dough arm, mix 3–4 minutes on 2nd speed.
4. Rest in retarder 20–30 minutes.
5. Roll in remaining butter and give 3 three-folds, as shown in Figure 30.3.

Makeup:

See makeup techniques after recipe section.

Proofing:

90°F (32°C) with little steam. Egg wash after proofing.

Baking:

375°F (190°C).

Per 1 ounce:

Calories, 110; Protein, 2 g; Fat, 6 g (53% cal.); Cholesterol, 35 mg; Carbohydrates, 10 g; Fiber, 0 g; Sodium, 120 mg.



Croissants



Ingredients	U.S.	Metric	Percentage
Milk	1 lb	450 g	57%
Yeast, fresh	1 oz	30 g	4%
Sugar	1 oz	30 g	4%
Salt	0.5 oz	15 g	2%
Butter, soft	3 oz	80 g	10%
Bread flour	1 lb 12 oz	800 g	100%
Butter	1 lb	450 g	57%
<i>Yield:</i>	<i>4 lb 1 oz</i>	<i>1855 g</i>	<i>234%</i>

■ Procedure

Mixing:

Straight dough method.

Scald milk, cool to lukewarm, and dissolve yeast. Add remaining ingredients except last 1 lb (450 g) butter. Mix into a smooth dough. Do not overmix.

Fermentation:

1 hour at 80°F (27°C).

Punch down, spread out on flat pan, and rest in retarder 30 minutes.

Roll in last amount of butter and give 3 three-folds (see Figure 30.3). Rest in retarder overnight.

Makeup:

See Figure 30.20 on page 929.

Proofing:

80°F (27°C). Egg wash after proofing.

Baking:

400°F (200°C).

Per 1 ounce:

Calories, 110; Protein, 2 g; Fat, 7 g (57% cal.); Cholesterol, 20 mg; Carbohydrates, 10 g; Fiber, 0 g; Sodium, 160 mg.