OBJECTIVES

After reading this section, you will be able to:

- Describe five types of cakes and their mixing methods.
- Demonstrate how to scale and pan cakes.
- Bake, cool, and serve cakes.

CUSTOMERS often look forward to something sweet, such as cake, for a conclusion to a good meal. Cakes are made of eggs, flour, sugar, fat, leavening, and flavorings. They can be as simple as a pound cake or as elaborate as a wedding cake. This section introduces different types of cakes and how to make them.

**TYPES OF LAYER CAKES**

There is an almost limitless variety of cake formulas. Different textures and tastes result from the type of fat and the different ingredients used. The five basic varieties of cakes are:

- Pound cakes.
- Sponge or foam cakes.
- Angel food cakes.
- Chiffon cakes.
- High-ratio layer cakes.

Cake ingredients either weaken or strengthen a cake’s structure and determine its texture, moisture, and sweetness. For example, sugar and fat, used in proper amounts, help weaken cake structure and give the cake tenderness. On the other hand, eggs and flour both have proteins that, when baked, join together to give the cake support. See Fig. 30-7.

The starch in flour also helps stabilize the cake by absorbing liquid when it is mixed. Liquid, such as milk or water, forms gluten when it combines with flour. When mixed, gluten gives structural support to the cake.

- **High-fat cakes.** These cakes generally use baking powder as the leavening agent. High-fat cakes, such as pound cake, also require that air cells be creamed into the center of the fat cell. The air cells then pick up the leavening gases that the heat of the oven releases.

- **Low-fat cakes.** Low-fat cakes, such as sponge cakes, are leavened from air that is whipped into the egg batter. These cakes have a light and springy texture. This makes them a good choice for desserts such as a torte that has many layers with cream and fruit between them.

KEY TERMS

- pound cakes
- sponge cakes
- emulsified shortening
- genoise
- angel food cakes
- chiffon cakes
Pound Cakes

The pound cake’s origin can be traced back to England. **Pound cakes** contain a pound each of butter, flour, sugar, and eggs. They are flavored to taste using vanilla, almond, or lemon. The butter pound cake is a familiar example, and is considered to be the basis for all layer cakes.

A pound cake can be frozen for up to two months, or kept refrigerated for a week. Many other variations on the basic pound cake have been developed, such as lemon poppy seed or chocolate pound cake.

Sponge or Foam Cakes

**Sponge cakes**, which are also called foam cakes, have an airy, light texture because of large amounts of air whipped into the eggs. This type of cake does not rely on butter or modern types of fat such as all-purpose shortening or **emulsified shortening**—a type of fat that helps create a smooth consistency throughout the mixture. Instead, sponge or foam cakes have a base of whipped, whole eggs.

European sponge cake, which is called **genoise** (zhen-WAHZ), is the most common example. Genoise can be the basis for special desserts with layers of jam, chocolate, or fruit filling. Because whole eggs are used in the batter, sponge cakes are richer than angel food cakes.

Angel Food Cakes

**Angel food cakes** are a type of foam cake that is made with egg whites—not egg yolks. The air whipped into the egg whites leavens the cake. Once the egg whites have been whipped, the cake batter must be finished quickly, or it will collapse when the air beaten into the egg whites escapes.

Usually angel food cakes are baked in tube pans. The pans are left ungreased so that as the batter rises it can attach to the sides of the pan. To prevent the cake from collapsing as it cools, the pan is turned upside down, and the cake left to cool inside the pan. Angel food cake may be served plain, frosted, topped with a chocolate or fruit-flavored glaze, or served with whipped cream or fresh fruit. Because angel food cakes contain no egg yolks or other fat, they are a healthier alternative to other cakes.
Vanilla Chiffon Genoise

YIELD: 10 LBS., 6 OZ. (SEVEN 9-IN. CAKES)    SERVINGS: 70

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
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<tbody>
<tr>
<td>2 lbs.</td>
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<tr>
<td>3 lbs.</td>
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<tr>
<td>12 oz.</td>
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<tr>
<td>2 lbs.</td>
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<tr>
<td>2 lbs., 4 oz.</td>
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<tr>
<td>1 oz.</td>
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<tr>
<td>5 oz.</td>
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<tr>
<td>To taste</td>
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<table>
<thead>
<tr>
<th>METHOD OF PREPARATION:</th>
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</thead>
<tbody>
<tr>
<td>1. Gather the equipment and scale the ingredients.</td>
</tr>
<tr>
<td>2. Properly grease the cake pans.</td>
</tr>
<tr>
<td>3. Place the egg yolks and half of the granulated sugar in a 5-qt. mixing bowl; whip to full volume.</td>
</tr>
<tr>
<td>4. Continue mixing on medium speed, and slowly incorporate the oil.</td>
</tr>
<tr>
<td>5. In another 5-qt. mixing bowl, whip the egg whites to a medium peak; slowly add the remaining granulated sugar to make a meringue.</td>
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<tr>
<td>6. Sift together the cake flour and baking powder.</td>
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<tr>
<td>7. Combine the water and vanilla extract.</td>
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<tr>
<td>8. Alternately add the flour and water mixtures into the yolk mixture by hand.</td>
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<tr>
<td>9. Fold the meringue into the batter.</td>
</tr>
<tr>
<td>10. Scale 1 lb., 8 oz. batter into each greased, paper-lined, 9-in. cake pan.</td>
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<tr>
<td>11. Bake at 360°F until spongy in the center.</td>
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</table>

Chiffon Cakes

Chiffon (shef-FON) cakes are a variation of genoise cakes. They are made by using whipped egg whites, or meringue (muh-RANG), to lighten a mixture. The egg yolks and part of the sugar are whipped to full volume and then the flour is added to the yolk and sugar mixture. Finally, the egg whites and the remaining sugar are whipped to form the meringue, and then folded in.

Chiffon cakes have less saturated fat and cholesterol than any cake except angel food, and about half the fat of a pound cake. Like angel food cakes, chiffon cakes are cooled upside down. Chiffon cakes can be stored in the freezer for up to two months or refrigerated for up to three days.
High-Ratio Layer Cakes

High-ratio layer cakes contain a high ratio of both liquids and sugar, giving the cake a very moist and tender texture. It is necessary to use a high-ratio shortening or emulsified shortening to help absorb the quantity of liquids. These cakes have a tight and firm grain due to the mixing method. The paddle attachment is used on the bench mixer to limit the amount of air that is mixed into the batter. Wedding cake is an example of a high-ratio layer cake.

CAKE MIXING METHODS

Mixing cake batter is an important step when making a cake. A properly mixed cake has the desired texture and grain. Air is blended into the batter and all ingredients are mixed completely. Each mixing method produces a certain kind of cake. Bakers use the following five standard methods. See Fig. 30-8.

Creaming Method

The creaming method was once the standard method for mixing a cake. To begin with, all ingredients should be at room temperature and accurately scaled. Then use the following steps:

1. Cream the butter or all-purpose shortening, sugar, and salt. Cream the mixture on medium speed for about 4-6 minutes, until it is lighter in volume, texture, and color.
2. Add the eggs and other liquids gradually in small amounts. Beat the mixture on low speed after each addition to fully incorporate the eggs without curdling.
3. Add the sifted, dry ingredients and mix on low speed to incorporate the dry ingredients with the wet ingredients.

Blending Method

The blending method is often called the two-stage method, because the liquids are added in two stages. This method produces a smooth batter that makes a moist, tight, and firm-grained cake. The blending method is used for making

Fig. 30-8.

<table>
<thead>
<tr>
<th>TYPE OF CAKE</th>
<th>MIXING METHODS</th>
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<tbody>
<tr>
<td>High-fat or Shortened Cakes</td>
<td>• Creaming method.</td>
</tr>
<tr>
<td></td>
<td>• Two-stage or blending method.</td>
</tr>
<tr>
<td>Low-fat or Foam-type Cakes</td>
<td>• Foaming or sponge method.</td>
</tr>
<tr>
<td></td>
<td>• Angel food method.</td>
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<tr>
<td></td>
<td>• Chiffon method.</td>
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</table>
high-ratio cakes, which means using large amounts of liquids and sugar as well as emulsified shortenings to absorb the liquids and sugar.

- Blend the sifted flour, sugar, chemical leaveners, and other dry ingredients for 30 seconds on medium speed.
- Add the emulsified shortening and half of the liquids.
- Mix on low speed until the ingredients are moistened.
- Increase the speed to medium and mix for 5 minutes.
- Scrape the sides of the bowl and add the remaining liquid.
- Blend on low speed for 3 minutes.

Angel Food Method

Angel food cakes have no fat and are based on egg-white foam. They do, however, contain a large amount of sugar. To properly whip the egg whites, do not add all of the sugar to them at once. Gradually add the sugar as you whip the egg whites to create high-volume foam. Follow these steps to make angel food cake:

1. Whip the egg whites with half the sugar, salt, and cream of tartar to full volume.
2. Sift the remaining half of the sugar with the flour. Fold the sugar and flour mixture into the egg-white foam just until it is absorbed.

Chiffon Method

The chiffon method is closely related to the angel food method. Follow these steps to make chiffon cakes:

1. Whip the egg yolks and half of the sugar to full volume. They will be a light pale yellow.
2. Fold in sifted flour and other dry ingredients.
3. Whip the egg whites and the remaining half of the sugar until a meringue with medium to stiff peaks forms.
4. Gently fold the meringue into the yolk mixture a small amount at a time. See Fig. 30-9.

Fig. 30-9. Carefully folding meringue into the chiffon cake mixture incorporating air and makes the final product fluffy.
ADJUSTING FOR ALTITUDE

According to where you live, you may need to make adjustments to your cake recipes. The higher the altitude, the lower the air pressure or atmospheric (at-mohs-SFEEAR-ik) pressure. This means that a higher percentage of liquid evaporates at high altitudes than it does at low altitudes. Because liquid evaporates from cakes as they bake, they may end up tasteless and tough.

For high altitude areas, use the following for recipes that include a leavening ingredient:

- For altitudes of about 2,000 ft., decrease the amount of baking powder or other leavening agent called for in the recipe by 15%.
- For altitudes of about 5,000 ft., decrease the level of baking powder or other leavening agent called for in the recipe by 40%.
- For altitudes at about 8,000 ft., decrease the amount of leavening agent by 60%.

Above 3,000 ft., the baking temperature for cakes should be increased by 25°F. This temperature will help prevent liquid evaporation.

\[
\frac{\text{wt. of ingredient}}{\text{wt. of flour}} \times 100\% = \% \text{ of ingredient}
\]

APPLY IT!

You are catering a family reunion in Denver. You plan to make a large sheet cake for the party. The sheet cake formula calls for 5 oz. of baking powder.

1. Denver is 5,280 ft. above sea level. How should the formula be adjusted?
2. If you alter the amount of leavening, how will other ingredients such as flour and eggs need to be altered?

**PANNING & SCALING CAKES**

To keep cakes from sticking, baking pans are usually coated with fat and flour or lined with parchment paper. This allows the cake to release easily from the pan. Commercial pan preparations are also available, such as spray pan release, which is a type of grease.

Pans should be filled one-half to two-thirds full, so that the batter does not spill over the sides of the pan as it rises. Spread the batter evenly using an offset spatula. Don't work the batter too much, or air cells will collapse and the cake will not rise properly. When making multiple cakes or when making a multi-tiered cake, always fill pans to the same level. If one pan has more batter, it will be larger and require longer to bake than the other cakes. For all but foam cakes, tap the filled pans firmly on a bench or counter to let large air bubbles escape before baking.

**Pan Preparation**

It is important to have the pans prepared before the batter is mixed. Pans should be filled as soon as possible after mixing is complete so that air cells in the batter do not collapse.

Most pans are either sprayed with an oil and flour mixture or greased and dusted with a bit of flour. See Fig. 30-10. Extra flour should always be tapped out of the pan so that the bottom of the cake does not get doughy. Some baked items can be placed on pans lined with parchment paper.

**Scaling Cake Batters**

Because it is important that cakes be consistently the same size, the batter is scaled before it is panned. How a batter is scaled is based on the amount of liquid in the batter and the amount of handling a batter can withstand.
- **Creaming method.** These thick batters do not pour easily. To scale cakes made by the creaming method:
  1. Place a prepared cake pan on the left side of the scale.
  2. Balance the scale to zero.
  3. Set the scale for the desired weight.
  4. Add batter to the prepared pan until the scale balances. See Fig. 30-11.

- **Blending method.** These batters can be scaled the same way. However, because they have more liquid, they can also be measured by volume:
  1. Place an empty volume measure on the left side of the scale.
  2. Balance the scale to zero.
  3. Set the desired weight and pour the batter into the volume measure until the scale balances.
  4. Pour the batter into the prepared pan, being careful to scrape out all of the batter from the volume measure.

- **Sponge or foam method.** To keep beaten eggs from collapsing in these batters, handle the batter as little as possible.

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**Fig. 30-11.**

<table>
<thead>
<tr>
<th>PAN TYPE &amp; SIZE</th>
<th>SCALING Wt.</th>
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</thead>
<tbody>
<tr>
<td><strong>High-fat Cakes</strong></td>
<td></td>
</tr>
<tr>
<td>• Round 8 in.</td>
<td>• 14–18 oz.</td>
</tr>
<tr>
<td>• Square 9 in. × 9 in.</td>
<td>• 24 oz.</td>
</tr>
<tr>
<td>• Loaf 2¾ in. × 3½ in. × 8 in.</td>
<td>• 16–18 oz.</td>
</tr>
<tr>
<td><strong>Low-fat Cakes</strong></td>
<td>• 10 oz.</td>
</tr>
<tr>
<td>• Round 8 in.</td>
<td>• 2½ lb.</td>
</tr>
<tr>
<td>• Sheet 18 in. × 26 in. × ¼ in. thick (for jelly roll or sponge roll).</td>
<td>• 24–32 oz.</td>
</tr>
<tr>
<td>• Tube (angel food and chiffon) 10 in.</td>
<td></td>
</tr>
</tbody>
</table>
BAKING CAKES

Baking the cake completes the chemical reactions begun when the batter was mixed. Preheat the oven to the correct temperature. If the oven is too hot, the cake may set before it has risen fully, or it may set unevenly, causing the crusts to be too dark. A temperature that is too low creates poor texture and volume, since the cake won’t set fast enough. Cakes also may collapse when oven temperatures are too low.

Ovens and the shelves in them should be level. When pans are placed in the oven, they should not touch each other. The air needs to flow between the pans for the cakes to bake evenly.

It is important to keep the oven door closed in order not to disturb cakes while they bake. Cakes may fall if they are disturbed before they finish rising or become partially browned.

Three tests for doneness may be used with cakes. A cake is done if:
- A pick or cake tester comes out clean when inserted into the center of the cake.
- The center of the cake’s top springs back when lightly pressed.
- It pulls slightly away from the sides of the pan.

COOLING CAKES

Cakes may break if turned out of the pan too early. Always cool cakes at least 15 minutes before removing them from the pan. When turning out sheet cakes, lightly sprinkle the top with granulated sugar. Place an empty sheet pan with the bottom side down on top of the cake. Turn both pans upside down and remove the top pan from the cake. If parchment paper has been used to line the pan, peel it off the cake. See Fig. 30-12.

To remove a chiffon or angel food cake from the pan, loosen the cooled cake using a spatula or knife. Put a cooling rack or tray on top of the cake pan. Turn the cake pan and rack over carefully holding on to both. Carefully remove the pan from the cake.

ICING & BUTTERCREAMS

Icing improves a cake by forming a protective layer around the cake that seals in moisture. Icing also adds richness and flavor. Fudge-type icings hold up well on cakes and last longer in storage. To use after storage, simply heat the icing in a double boiler until the icing can be spread.

Buttercream is usually used to make cakes, tortes, and desserts taste better and look more attractive. Here are five types of buttercreams:
1. Simple buttercream is made by combining butter, shortening, confectioner’s sugar, egg whites, and vanilla.
2. French buttercream is made with beaten egg yolks and butter.
3. Italian buttercream is made with Italian meringue and butter.
4. German buttercream is made with butter, emulsified shortening, and fondant—a sugar syrup.
5. Swiss buttercream is made with Swiss meringue and butter.

Fig. 30-12. Slowly remove parchment paper from the baked cake.
Icing Cakes

When deciding what type of icing to use, be sure that the icing is not too heavy for the cake. Dense cakes pair well with fudge-type icings and simple or German buttercreams. However, lighter buttercreams such as Swiss and Italian, whipped cream, and fruit fillings go well with sponge cakes. Simple syrups can also be used.

Before spreading the icing, tap off any loose crumbs from the cake that would interfere with a smooth appearance. When spreading the icing on a layer cake, do not spread too much on the first layer. The iced cake should have a uniform appearance with an even amount of icing all over it. Icing should not ooze out the side after the layers have been placed.

To ice the top layer, start from the center and work out to the edges. Then spread the icing down the sides of the cake. Be sure to smooth the surface before adding decorations. See Fig. 30-13.

Fig. 30-13. Using both hands, pull the spatula evenly across the surface to smooth out the icing. Why is a smooth surface needed for adding decorations?

STORING & SERVING CAKES

Cakes should be wrapped in air-tight containers or plastic wrap and stored in the refrigerator until needed. If cakes have not been decorated and have been properly wrapped, they can be kept frozen for up to one month.

Frosted cakes should be stored in the refrigerator until they are served. Because frosting easily absorbs refrigerator odors, decorated cakes should be boxed or covered before they are placed in the refrigerator. Always bring cakes to room temperature before serving them.

Sheet cakes keep fresh and moist longer than layer cakes. Sheet cakes can be stored after they are baked, then cut into various shapes, such as bars or squares, prior to being served.

SECTION 30-2 Knowledge Check

1. Contrast chiffon cakes and pound cakes.
2. Explain one of the five methods for mixing cakes.
3. Describe the process for icing a cake.

MINI LAB

In teams, produce a cake. Be sure to add icing or a topping. Evaluate each team’s cake on appearance, texture, and flavor.