

## Cakes

Cakes celebrate the ceremonies and milestones of our lives
-birthdays, weddings, and almost any other festive occasion
-and for good reason. No matter the variety
-layer cakes, sheet cakes, Bundt cakes, cheesecakes
-brought to the table at the end of the meal, a cake always elicits admiration. Cookies are delightful and pies are tasty, but no dessert is quite as impressive as a beautifully baked and finished cake.

Cake recipes don't have to be fussy and difficult, however. Simple, unfrosted varieties such as pound cakes and coffee cakes are just as delicious as their showier layered cousins. In this primer, we'll explain the differences between the various types, as well as the basic steps that are common to nearly all cake recipes. If you're a novice baker, you can start with the simple pound and angel food cakes in the list below and move on to more complicated recipes as you gain confidence. And if you're already experienced, understanding the different categories of cakes and the various options for finishing them will give you a basis for experimenting and creating recipes of your own.

## Type of cakes

There are many different types of cakes and many different ways of dividing them into various categories, but professional bakers categorize cakes by ingredients and mixing method. (Home bakers tend to categorize cakes by flavoring-i.e., chocolate cakes, fruit cakes,which is helpful when you're trying to decide what to eat, but not as helpful when you're trying to understand how best to make a cake.) Depending on how the batter is prepared, you will find that the final texture (and color, if it is a yellow or white cake) varies. Below is a comprehensive but by no means exhaustive list of the basic types of cakes:
Butter-type cake
Foam-type cake
Chiffon-type cake

## Butter-type cake

- Butter (or Oil) Cakes
- These contain some kind of fat-often butter, but sometimes oil-and baking powder to leaven them or make them rise. If the fat is butter, the ingredients are usually combined using the creaming method, which means that the soft butter and sugar are beaten together in an electric mixer to partially dissolve the sugar and to incorporate some air. Then the dry and wet ingredients are added in alternating doses. This results in a light and airy crumb, though not quite as light as that of a sponge cake (see below). The best butter cakes have a moist buttery richness tempered by lightness. Included in this category are:


## Butter-type cake

- Pound Cakes: This is the simplest type of butter cake. A classic pound cake is made with a pound each of butter, sugar, eggs, and flour. This produces a dense yet tender texture. Pound cakes are heavier than the types of butter cakes used for constructing layer cakes (see below). They're easy to prepare, with the only trick being that the butter must be quite soft when you begin. These cakes are usually very lightly flavored and served plain or topped with a simple glaze or water icing. A pound cake is usually baked in a loaf or Bundt pan. Many coffee cakes, sour cream cakes, and fruit crumb cakes are variations of pound cake.


## Butter-type cake

- Butter (and Oil) Layer Cakes: Many different types of cake can be arranged in layers. However, classic American layer cakes are usually butter or oil cakes. The birthday cake you ate as a child was probably of this type. These cakes are lighter than traditional pound cake, but more moist and flavorful than European-style sponge layer cakes (see below). Cakes in this category include: devil's food cake(the classic chocolate layer cake), golden cakes (made with egg yolks, which add richness and a golden color), and white cakes (made with egg whites, which create a lighter, whiter-colored cake).


## Sponge and Foam Cakes

- Sponge and Foam Cakes
- These are notable more for what they are missing than for what they contain: They usually do not include fat, such as butter or oil, and they do not incorporate leaveners, like baking powder. Instead, volume is created by whipping the eggs or egg whites. The air whipped into the eggs expands during baking, causing these cakes to rise on their own without baking powder. However, the success of this method depends on not deflating the eggs after whipping them. To this end, dry ingredients are usually sifted over and gently folded in, and fat is often avoided, as it would weigh down the foamy batter.
- This method produces extremely light, airy cakes with a spongy texture but generally less flavor and moisture than butter and oil cakes. The basic types of sponge and foam cakes are:


## Sponge and Foam Cakes

- Angel Food Cake: This type is made with egg whites alone and no yolks. The whites are whipped with sugar until very firm before the flour is gently folded in, resulting in a snowy-white, airy, and delicate cake that marries beautifully with fruit. Most angel food cakes have a spongy, chewy quality derived from their relatively high sugar content and the absence of egg yolks. Baked in ungreasedtwo-piece tube pans, angel food cakes are cooled by being inverted, since this type of cake would collapse if cooled right-side-up in the pan or if removed from the pan while still warm.


## Sponge and Foam Cakes

- Genoise: This type of sponge cake is made with whole eggs rather than just egg whites, which gives it a richer flavor than angel food cake. The eggs are combined with sugar and gently heated over simmering water, then whipped (heating the eggs allows them to be whipped to a greater volume). Genoise lacks much assertive flavor of its own, but it is often used to construct layered or rolled cakes when a lighter texture than a butter cake is desired. To add flavor and moisture, genoise cake layers are always moistened with a flavored syrup, and they are often sliced into thin horizontal layers and stacked with rich fillings such as buttercream. These layer cakes, common in the coffeehouses of Europe, are called "European-style" to distinguish them from American-style butter layer cakes, which generally have fewer, thicker layers.


## Sponge and Foam Cakes

- Biscuit (always pronounced the French way as beeskwee): This type of sponge cake contains both egg whites and yolks, but, unlike in genoise, the whites and yolks are whipped separately and then folded back together. This creates a light batter that's drier than a genoise but holds its shape better after mixing. For this reason, it's often used for piped shapes such as ladyfingers. If baked in a tube pan like an angel food cake, it makes a very chewy sponge cake that was popular in the early 20th century but has since fallen out of favor. However, it's still known in a slightly different form as the classic Passover sponge cake, in which the flour is replaced by matzoh cake meal and potato starch.


## Sponge and Foam Cakes

- Chiffon Cake: This fairly recent American creation was invented by a salesman who sold the recipe to General Mills, which spread the recipe through marketing materials in the 1940s and 1950s. A classic chiffon cake is kind of a cross between an oil cake and a sponge cake. It includes baking powder and vegetable oil, but the eggs are separated and the whites are beaten to soft peaks before being folded into the batter. This creates a cake with a tender crumb and rich flavor like an oil cake, but with a lighter texture that's more like a sponge cake. Chiffon cakes can be baked in tube pans like angel food cakes or layered with fillings and frostings.


## Low- or No-Flour Cakes

- Cakes made without flour (or with very little) generally have a creamy or silky texture. They can be baked or unbaked:
- Baked Flourless Cakes: These include baked cheesecakes and flourless chocolate cakes. For easy removal, they're often made in a spring form pan, though some can also be made in regular round layer cake pans. Often the filled pan is placed in a larger pan that's half-filled with water to insulate the delicate, creamy cake from the oven's strong bottom heat, which might give the baked cake a porous rather than silky texture. This is called baking the cake in a water bath.
- Unbaked Flourless Cakes: These types of cakes are typically molded in a dessert ring or spring form pan then simply chilled before unmolding. They include unbaked cheesecakes and mousse cakes. They often have a crust or bottom layer that's baked before the mousse is added.
Sometimes other layers, such as genoise or biscuit, are alternated with the mousse.


## Ingredients

Each ingredient used in cake baking is employed for the specific characteristics it has and/or the result it has on the finished product. If these effects are understood, the ingredients may be selected with the assurance that the products produced will be good..

| Flour | Leavening, Baking Soda |
| :--- | :--- |
| Syrup | Smell, Savor, Spices |
| Sugar | Liquid ; milk, water |
| Salt | Milk powder |
| Oil, Shortening | Egg |

## Flour

Flour is the primary structure builder in most cakes. The gluten formed during mixing coagulates during baking and assists in supporting the heavy weight of sugar and shortening. Cake flour used in cake baking is made from soft wheats. Flours milled for bread baking will be made from hard wheat. Cake flour should have a low protein content ( 7 to 9 percent). Cake flour should be properly bleached, because bleaching helps to carry more sugar and shortening as well as water during mixing. Cake flour should also have a P.H. of around 5.2 which is slightly acid. This acidity helps to mellow or soften the gluten.

## Sugar

Sugar is used in cake as a sweetener. Sugar is considered a tenderizer because of its tenderizing effect resulting from the softening action on flour proteins. Sugar lowers the carmelization point of the batter, allowing the cake crust to color at a lower temperature. Sugar helps to retain moisture left in the baked cake after baking thereby keeping the cake moist and edible for several days. A portion (about 50 percent) but not all of the sugar may be replaced with sirup. When this is done, the liquid content of the sirup must be deducted from the liquid going into the mix. For example, if 50 pounds of cane sugar is to be replaced with a sirup containing 80 percent sugar solids, it will be necessary to divide 50 pounds of needed sugar solids 50, by 80 percent (the percentage of sugar solids contained in the sirup) equals 62.5 pounds of sirup to use. Multiply 62.5 pounds of sirup times 20 percent (the percentage of water in the sirup) equals 12.5 pounds of water in 62.5 pounds of sirup. Subtract 12 pounds of water from the amount of water called for in the formula so the water content of the formula will remain constant. The greater the percentage of sugar contained in the formula, the longer the cake will stay fresh. The amount to use will be covered later under formula balance. For optimum results, sugar must be completely dissolved in the batter. This is the reason why in balancing a cake formula, especially in HIGH RATIO CAKES (Cakes containing greater quantities of sugar and water than flour in the formula) water must exceed the sugar in the formula.

## Salt and Shortening

- Salt:

Salt is used primarily for taste and to tone down the sweetness.

- Shortening: Shortening incorporates air in the cake batter during mixing. This air helps to obtain volume in the baked cake. It also tenderizes the cake. In making HIGH RATIO cakes, an emulsified shortening must be used to form an emulsion. Regular shortening is not capable of forming an emulsion when large amounts of sugar and liquid are used. If not enough liquid is used to dissolve the sugar, the cake will collapse in the center.


## Egg

- Eggs:

Eggs furnish structure, moisture, flavor, color, and food value to the cake. Their most valuable contribution is structure. The proteins in the eggs coagulates during baking and assists the flour as a structure builder. Egg is the only ingredient that can be used to regulate the toughening action in a cake. If a weak flour is used, the eggs can be increased. If the percentage of shortening (a tenderizer) called for in the formula is increased, the eggs must be increased also. It is important to know the percentages of fat, moisture, and protein content of eggs when balancing cake formulas.

- To get the same amount of solids when using egg whites in lew of whole eggs, the amount of egg whites would have to be increased and the moisture going into the mix must be decreased. To get the same amount of moisture when using egg yolks in lew of whole eggs, the moisture content must be increased. The amount of eggs to use in a cake formula will be discussed in formula balance.


## Milk Solids

- Milk Solids:

Milk solids have a binding effect on the protein of the flour, thereby increasing the toughness in a cake. A portion of the total solids in milk contain lactose sugar, which carmelizes at a low temperature ( 270 to 275 degrees F.). It is used to control crust color. It, along with the proteins in milk, adds food value and flavor to the cake, and helps to retain moisture in the cake. If liquid milk is used in lew of dry milk powder, it will be necessary to know the liquid content of the milk in order to make adjustments to the formula so the formula can be properly balanced. The various types of milk are composed of the following percentages of components: Fresh whole milk is composed of 8.5 percent solids; 3.5 percent butterfat; 88 percent water. Milk, Dry Whole is composed of 72 percent solids; 26 percent butterfat; 2 percent water. Milk, Solids Nonfat is composed of 97 percent solids; 1.5 percent butterfat; 1.5 percent water.

## Leavening

- Leavening:

Cakes are leavened mainly in three ways. Incorporation of air during mixing, chemically leavened and vapor pressure created in the oven. The manner of leavening depends upon the type of cake being made in regard richness of formula, consistency of batter and baking temperature. Cakes low in water and high in ennriching ingredients get a larger amount of leavening during mixing and require less chemical leaveners than cakes made from lean formulas high in liquids. In addition to leavening the cake, chemical leaveners control the eating qualities of the cake. Excess soda , for example results in an undesirable "soapy taste". Baking Soda is necessary to produce the rich red color in Devils Food Cake. However, one must be careful not to use too much soda in the formula. To produce a chocolate cake having a brown crumb color rather than a red crumb color, Baking Soda must be left out. Some types of cakes require no chemical leavening. Examples are the true Pound Cake and the Basic Sponge Cake. These two cakes are leavened entirely by physical means such as air incorporated in the batter during mixing and vapor pressure created during baking. This is the reason why these types of cakes require a longer mixing period and precise control of temperature of the batter during mixing.

## Liquids

- Liquids:

Liquids in some form is required in every cake formula. The liquid may be in the form of water, liquid milk, eggs or any other ingredient which contain water. Water has several functions in cake production. It developes the gluten, dissolves the sugar, makes the function of baking powder possible, regulates the batter consistency, and controls the temperature of the batter. It is possible to carefully regulate the water portion of the formula by figuring the liquid content of any liquid ingredient used in the batter. The amount of water going into the cake formula is partially controlled by the type of shortening used. An emulsified type shortening will carry considerably more water in the mix, thus allowing the use of more sugar such as in High Ratio Cakes The total liquids (Liquid in the form of water and the liquid contained in the eggs) should always equal or exceed the weight of the sugar in the formula, because all of the sugar in the formula must be dissolved to produce a quality cake.

## Basic Step

Cake baking is not difficult, but it requires some organization and forethought. While the steps for making a cake vary considerably depending on the type, you'll want to do the following before attempting any recipe:

## Basic Step

1. Read Through the Recipe

This sounds obvious, but cakes in particular have certain requirements, such as the temperature of ingredients, that cannot be altered. You don't want to realize too late that the butter you just mixed with sugar was supposed to be softened.

## Basic Step

2. Assemble Ingredients and Ensure Their Correct Temperature

Get all of your ingredients and equipment out on the counter before you begin and make sure they're at the proper temperature. This is especially important for butter and eggs: Soft butter makes for a smooth batter and a lofty cake, and roomtemperature eggs keep the batter's temperature consistent.

To soften butter, leave it out for several hours; it should offer no resistance when you press on it. Or, you can hurry the process using a microwave: Cut the butter into $1 / 2$-inch cubes, arrange them in a single layer on a microwave-safe plate, then microwave on high for 3 seconds at a time, testing in between, until the butter is softened but not melted.

## Basic Step

3. Preheat the Oven

Before preparing the batter, your oven should be at the correct temperature. A batter will not react properly to heat if it sits at room temperature for 10 minutes waiting for the oven to heat. Nor will it rise properly if the oven continues to warm up after the pan has been placed in it. Avoid burning your cake by setting a rack in the middle of the oven for cake layers or in the lower third for a tube cake so that the top of the pan is not too close to the top of the oven.

## Basic Step

4. Prepare Your Equipment

To ensure that your finished cake has the right shape, it's important to make sure that it will come out of the pan in one piece. The most common way to do this is to coat the pan with butter, but the specifics may vary depending on the type of cake. For cake layers in general, you coat the inside of the pan with very soft but not melted butter using a brush. Follow that with a disk of parchment paper cut to the size of the inside of the pan. For a butter cake baked in a Bundt pan, coat with soft butter, and then coat the buttered surface with fine, dry bread crumbs, tapping the inverted pan to dislodge any excess. Follow with a quick coat of vegetable cooking spray for a guarantee that the cake won't stick. Line a rectangular or square pan with foil by molding the foil first on the back of the pan, then pressing it into the pan. Butter the foil. This makes it easy to lift a cake that you don't want to invert, such as a crumb cake, right out of the pan.

## Basic Step

5. Prepare the Batter

Instructions will vary depending on the type of cake: For butter cakes, the ingredients will typically be combined using the creaming method; for sponge cakes the eggs will generally be beaten, then folded in. For the proper texture, be sure to follow the instructions closely, and then pour the batter into the pan or pans and bake.

- See our videos on preparing various kinds of cake batter:


## Basic Step

6. Test for Doneness

To test a cake, plunge a thin knife or cake tester into the center (or halfway between the side and the tube if using a tube pan). When a cake is finished, you will find a few crumbs sticking to the knife or tester when you withdraw it. If the cake is not ready yet, there will be wet batter on the knife or tester.

## Basic Step

7. Cool the Cake

Most cakes are cooled on a metal rack for even air circulation. A recipe will indicate whether the cake should be cooled in the pan or unmolded immediately. Follow instructions carefully-leaving certain types of cakes in the pan for too long may cause them to stick. Angel food cakes and chiffon cakes need to cool suspended upside down in their tube pans or they will deflate and look squashed and unappealing when you cut them. Invert the pan over several inverted ramekins so that the edges of the pan are supported by them. It is best to figure out the system for doing this before you begin baking the cake by testing the empty pan over the ramekins to make sure your system will be stable.

## Basic Step

8. Unmold the Cake

When you are ready, gently run a sharp, thin knife between the edge of the pan and the cake. Then invert a rack or platter (as indicated in the recipe) over the top of the pan. Turn the pan over and lift it off the cake. You may be asked to finish cooling the cake upside down or instructed to turn it right side up again. Be sure to follow instructions, as each type of cake cools best in a different way.

## Basic Step

9. "Finish" the Cake

As described in the section on fillings, frostings, and glazes, options for finishing a cake are numerous. Some varieties, such as pound cakes and crumb cakes, are finished already when they come out of the oven and don't need any embellishment at all. For others, a simple dusting of powdered sugar or quick brush with a glaze may be all that's required. And some cakes, such as European-style layer cakes, can be filled with multiple fillings, frosted with a different frosting or glaze, and then adorned with elaborate decorations, such as piped buttercream or marzipan crafted into roses and leaves.

## Formula Balance

In order to create a cake batter that will produce high quality cakes, certain amounts of the different ingredients have to be put together in a definite sequence at controlled mixing speed, time and temperature. The general relationship of ingredients that have to be brought into balance, differ according to the type of cake to be produced. In other words, the formula balance for batter cakes differs considerably from that of the foam type cake (Sponge cake and Angel food cake). These will be discussed separately. The following general rules apply to Batter type cakes:

## Formula Balance

## - RULE 1.

The weight of the sugar should equal or exceed the weight of the flour. There is a top limit, of course in the amount of sugar which can go into a cake. For White and Yellow Layer Cakes, 145 percent sugar-flour ratio seems to be about the generally accepted practical top limit. Higher sugar-flour ratios are possible in cakes containing cocoa or chocolate. The more cocoa or chocolate used in the formula, the higher the sugar-flour ratio can be. The amount of liquid also become significant in determining the amount of sugar to use. When RULE NO. 1 is applied and a specific amount of sugar is selected, both the amount of sugar and the amount of flour become fixed. To set up the formula, it then becomes necessary to consider the amount of shortening, eggs and liquid which can be used. As the percentage of shortening is increased, the percentage of eggs must be increased by the same amount. This is due to the fact that shortening is a tenderizer and to keep the cake from being over tenderized, additional structure in the form of eggs is needed.

## Formula Balance

## - RULE 2.

The weight of eggs should equal or exceed the weight of the shortening. In applying this rule, the type of cake desired must be considered. For example, a true pound cake will have equal parts of shortening or butter, sugar.flour and eggs. A high ratio layer cake will have about 50 or 60 percent as much shortening as flour and the eggs should at least equal the amount of shortening in the mix. Eggs generally exceed the shortening by 5 or 10 percent. Since shortening carries air into the batter, a cake with a high percentage of shortening will be classified as a rich formula. The air carried by the shortening will result in less chemical leavening being needed.

## Formula Balance

- RULE 3.

The combined weight of the eggs plus the liquid, should equal or exceed the weight of the sugar. In layer type cakes, the weight of the liquids usually exceed the sugar by 20 t0 30 percent. In devils food cake, the liquids usually exceed the sugar by 40 to 50 percent. In pound cakes, best results are obtained if the liquids and sugar are nearly equal because pound cake batter needs to be slightly thicker.

## Next week



## Orange Cake

## Ingredients

1. แปังเค้ก

150 กรัม
4 ฟอง
3. นมสด

90
กรัม
4. น้ำตาลทราย

150 กรัม
5. น้ำมันคาโนล่า
6. ผงฟู
7. วนิลา
8. เกลือ
9. เอสพี

12 กรัม

เตรียมพิมพ์ รองกระดาษไข อบ 350 องศาฟาเรนไฮด์ อบ $20-30$ นาที ได้ เค้ก 3 ปอนด์

1. ร่อนแปัง ผงฟู่ เกลือเข้าด้วยกัน 2 ครั้ง แล้วพักไว้
2. ติไข่ นมสด น้ำตาล เอสพี ด้วยสปีดแรง 5 นาที
3. ลดสปีดต่ำ ใส่แป้ง ตี 1 นาที
4. เร่งสปีดสูง $4-5$ นาที ใส่วนิลา
5. ลดสปีดต่ำ ใส่น้ำมันคาในล่าเป็นสาย ตีต่อจนน้ำมันเข้ากันเป็นเนื้อ เดียวกันประมาณ 1 นาที
6. เทใสพิมพ์ กระแทกพิมพ์ อบ $20-30$ นาที
7. นำออกจากเตาอบ พักไว้ $15-20$ นาที ก่อนแสะออกจากพิมพ์

## ซอสแยมส้ม

ஸ้า\%้ มศันควิ
ค้ำดกใ

- ஸ้?

- $69^{9}$ คกวน์ำ

100 กรัม
120 กรัม
400 กรัม
4-5 หยด
40 กรัม

## วิธีทำ

1. ตวงส่วนผสม น้ำส้ม น้ำ น้ำตาล รวมกันเทใส่หม้อ
2. ใส่แป้งกวนใส้ กวนให้ละลาย ใส่สีผสมอาหาร
3. เปิดไป กวนจนข้น


