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FRANCISCO MIGOYA
THE CULINARY INSTITUTE OF AMERICA

THE ELEMENTS OF DESSERT

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FRANCISCO MIGOYA
THE CULINARY INSTITUTE OF AMERICA
PHOTOGRAPHY BY BEN FINK



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CONTENTS

ACKNOWLEDGMENTS vi

INTRODUCTION vi

Ch ¹	The Basic Elements	1
Ch ²	Pre-Desserts	105
Ch ³	Plated Desserts	163
Ch ⁴	Dessert Buffets	261
Ch ⁵	Passed-Around Desserts	331
Ch ⁶	Cakes (Entremets)	381
Ch ⁷	Petits Fours (Mignardises)	449

BIBLIOGRAPHY 519

RESOURCES 520

INDEX 522

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INTRODUCTION

Nothing is more valuable than experience when it comes to developing a dessert. But where does that experience come from? Does it come from working in a pastry kitchen for many years, and then suddenly the ideas just start flowing? Does it come from studying pastry in school? No—work and study alone are not going to produce the wonderful menu items you are hoping to make. In my opinion, dessert creation is somewhat more ambiguous in its roots, but there are certain starting points that are the pillars of creativity and production.

One of these pillars is a constant intake of information. I have an ongoing interest in what other chefs and pastry chefs are doing. I taste the recipes of others; I read as many books, magazines, and blogs as I can; and I test recipes on a continual basis. I interpret food according to

my taste, textural, and visual preferences, and sometimes during that process, there is an original idea or thought.

Not everything you make can be new or never seen before. Everything comes from something, and this brings me to the creative process of making desserts, which is really quite simple. All of the ideas you have are the result of the information you have stored in your brain. Your brain creates a map of these experiences, and it is constantly working on finding places on this map, creating new roads on it as new information is stored. The bigger the map is, the more results it will churn out. This is why most of us mortals need a few years before we develop a menu we can call our own.

I believe I have a good-size food map in my brain, which helps me to develop ideas and brainstorm in the kitchen. However, having a well-developed map does not

mean that every idea will work. If you test out one of your ideas and it is just plain bad, that also becomes part of the experience and builds on your personal food map. Chances are, there will be many more bad ideas than good. Finding a good idea is like finding the treasure in the map. To me, few things in life are more exhilarating than coming up with a dessert that balances it all: flavor, texture, and aesthetics.

What kick-starts the ideation process? Maybe it is a single ingredient you are curious about, or a method you saw a chef use that you had not seen before. Or maybe it is just a different approach to something you have done many times before. For the most part, I create a mental image of what I would like to see. My ideas are based initially on an aesthetic approach. I am comfortable with that because I already know that I can translate that image into something appetizing; it is just a matter of searching my mental database. But I have also created a dessert based on a beautiful dish, a new ingredient, a new method, or a new technique.

There is no single source for ideas, and it is important to realize that. Just remember, in order to come to that place where ideas just flow, you need to expose yourself to as much food (pastry and savory) as you can. When you first start out as a pastry apprentice, and even when you get your first actual pastry chef job, it is OK to emulate other pastry chef's desserts. It is not a crime. Just don't make it a constant habit; otherwise, you will not be able to develop your own style. Style is something you can truly call your own and is what will distinguish you from other pastry chefs. A unique style is easier to develop than a new dish. And, if you are the creative source for a new technique or a new dish that no one has seen before, you just might be destined for greatness. Most of the ideas that are considered innovative or revolutionary really just come from the chef taking a different approach, or looking at something in a different way than anyone else ever has. According to Vilfredo Pareto, an Italian economist and sociologist from the late nineteenth century, an idea is nothing more or less than a new combination of old elements that are related. But it is your capacity to form old elements into new combinations and your ability to see the relationships between those elements that will determine the creation of a "new" idea. Take the now

(in)famous foams, for example. These whippers were used for years exclusively for dispensing whipped heavy cream, but then there was a revolution. Ferran Adrià realized that whatever went into that whipper had to have the capacity to take air in and remain stable inside the canister, so it could be a flavored cream, or a fruit purée with a small amount of gelatin. It is people like him (and Thomas Keller and Michel Bras) who saw something others didn't see, and they are originals in their own right. It is finding the new view, the new method or technique, that will be the biggest claim to fame a chef can ever have.

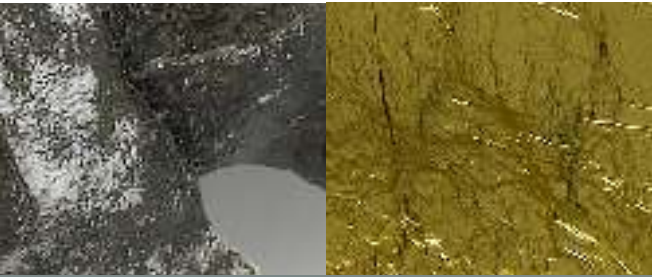
You will very likely make a fair amount of mistakes, but that is part of the process. The most important lesson to be learned from this is that you cannot give up easily. In my experience, I give a dessert no more than four chances, meaning that it will only go four steps away from the original idea before I decide to drop it. When food is too overworked or overthought, it shows. Your food will look awkward and contrived and it will be hard for the customer (and even your staff) to get it. As wise as it is to not give up, it is also wise to know when to rethink your idea. You will need to decide if you give your dessert four chances or ten. It really is up to you and how much you believe in the original idea.

I want to make sure that you know and understand the most important quality aspect of a finished dessert before you get started. It is not flavor, texture, or aesthetic. The most important quality is wholesomeness. That means that whatever you make, it should be beneficial and generally good for your customers. If you work in sanitary conditions and you follow food safety principles, it will be the most important aspect of your food. After wholesomeness, then you can think of flavor, texture, and aesthetics. Here is what I explain to my staff: People are going to come to our restaurant, order our food, put the food we made into their bodies, and then pay with their hard-earned money. There is nothing more personal than that, and we should be humbled by this privilege. Think of how many people can do what we do. The trust that your customers put in you is enormous, and you need to respect that.

Ch¹



THE BASIC ELEMENTS



The word *dessert* comes from *desservir*, a French term that means “to remove that which has been served.” Essentially, it is what is offered to the guests after everything on the table has been cleared. The meaning has evolved to an extent, but the principle has not. Once your entrée or last course has been cleared, the utensils and all glassware have been removed, and the table has been “crumbed,” then the dessert is served.

It is important to understand that dessert can be presented and served in many different ways and in a variety of environments. Each setting will have a style or type of dessert that is ideal and makes the most sense to maintain the quality of the product.

Dessert is vastly more far-reaching now than it ever has been; in fact, it has become very complex and multifaceted. For all intents and purposes, dessert is the final course, but the context in which dessert can be categorized is more than something you have after your entrée. There may be courses that border the lines of sweet and savory but cannot be categorized as dessert *per se*. As a pastry chef, you need to really understand how far desserts can be broken down and what makes the most sense for your operation. Is your establishment high end, and does it require a large menu or a short menu? Do you offer pre-desserts or only desserts? Can your customers choose from a cake menu for a special occasion? Can you offer petits fours, and if so, how many and what is a good variety?

One of the questions asked most frequently by pastry cooks and pastry students is: How does one come up with flavor combinations? The short answer is that after a few years of manipulating and tasting food, not just where you work but in as many places as you can manage, you will come to your own conclusions and figure out what you like and dislike. This is mostly accurate, but it doesn't mean that because you like a particular flavor combination, everyone else is going to like it. This is one of the biggest reasons why some pastry chefs are successful and some are not: If your flavors work well together, people will want to eat your desserts. If they do not, they won't. We make desserts for people to eat and enjoy.

The comprehensive table of flavors on pages 61 to 84 is codified in the following way to help explain which flavors complement each other.

- **Ingredient name (ingredients are divided into categories—fruit, herbs, spices, flavorings, and so forth—and will contain some nontraditional ingredients)**
- **Type of flavor: frontal, background, or mild**
- **Flavor compatibility**

There is also a table of the most frequently used pastry preparations and components, which is meant to be used as a reference to begin the creative process. You can use this to visualize all that you can produce, and then it is just a matter of matching the components properly. Essentially, this is what you will need to know to create your own desserts:

- **The basic pastry methods**
- **The components of pastry**
- **Flavors and textures**
- **The principles of dessert composition**
- **The principles of menu composition and item enunciation**

These are all of the key points in this chapter and are the pillars or the basis of your technical knowledge. The experience part is entirely in your hands.

THE BASIC PASTRY METHODS

As with anything, pastry is all about the foundations you have acquired through experience. Once you have become comfortable with them, you should be able to move on to more elaborate and complex techniques. This is similar to what the artist Pablo Picasso did during his career. He was a master of technique. He knew how to use different materials and he also knew how to construct a canvas with his own hands. His style changed as he experimented with different theories, techniques, and ideas until he was able to start an entirely new movement. The point is, he did not jump into Cubism right away. He established a solid technical foundation beforehand. The same is true in pastry.

This section will cover all of the basic information you need to know about the most widely used pastry methods. All of these methods will be used throughout the book and have been organized alphabetically for ease of use. The recipes throughout the book will cross-reference these methods as needed.

THE BLENDING METHOD

This method is most commonly used for quick breads in which two or more ingredients are combined just until they are evenly mixed. The fat used is a liquid fat. We will be applying this method to certain sponge cakes, such as the Blackout Cake on page 303 and the Devil's Food Cake on page 256.

THE BLENDING METHOD IS AS FOLLOWS:

1. **In the bowl of an electric mixer fitted with a paddle attachment, combine all of the liquid ingredients on medium speed. Some recipes require a whip instead; it depends on the density of the final mass—will it be loose like a light *génoise*, or dense like a *pain de gènes*?**
2. **Sift all of the dry ingredients together.**
3. **Add the dry ingredients to the liquid ingredients and mix on low speed.**
4. **Mix until just incorporated, scraping the bowl as necessary. Don't overmix, since this can cause gluten development in the flour and make the final product denser than intended.**
5. **Add the garnish at the end if needed in the recipe. The garnish is not obligatory, but in some cases a recipe will call for one. Some examples are chopped dried fruit or nuts.**

THE CREAMING METHOD

Used for certain cakes (such as pound cake) and doughs (most cookies and tart doughs are made with this method), the creaming method is a mixing method in which softened fat (generally butter) and sugar are vigorously combined, either manually or mechanically, to incorporate air. This trapped air is partially responsible for the leavening of the product. The main ingredients used are sugar, fat, eggs, and flour. The sugar is granulated to assist in incorporating air into the mixture. Superfine sugar or bakers' sugar yields better results than regular granulated; the sugar dissolves better and faster into the fat because the crystals are smaller. The fat should be between 21°C/70°F and 22°C/72°F. This temperature will allow it to take air in more readily than if it were cold. Oil should not be used since it does not have the capacity to trap air with this mixing method. Vegetable shortenings and animal fats such as lard and duck fat may be used, but the end result will vary. The eggs should be warmed over a hot water bath to between 26°C/80°F and 29°C/85°F. They are usually added slowly into the butter in order to create an emulsion, and their warm temperature makes the mixing process more efficient. If the eggs are colder, the butter will seize and the emulsion will break. If the eggs are warmer, they will soften the butter too much and any trapped air would escape, resulting in a flat product. Milk, water, or fruit juices may be added to the eggs, but the eggs cannot be completely replaced. The flour that is used should be a low-protein flour, such as pastry or cake flour, but sometimes an all-purpose flour is also used. Other dry ingredients may be combined with the flour for flavor and texture, such as ground nuts, dried fruit, or cocoa powder.

THE CREAMING METHOD IS AS FOLLOWS:

1. **Soften the butter. It can be left out of the refrigerator for 2 hours before using, or it can be softened in the microwave in short intervals of time until the desired temperature is reached.**
2. **Warm the eggs over a hot water bath to between 26°C/80°F and 29°C/85°F. Reserve until needed.**

-
3. In the bowl of an electric mixer fitted with a paddle attachment, mix the butter and sugar together on medium speed until there are no lumps of butter or sugar. Five to 10 minutes is appropriate for an item such as a pound cake, since this action makes the butter fluffier and aerates it as well as helps grind the sugar into the butter. If you are making a tart dough or cookie dough, simply mix the butter and sugar until both components are very well incorporated; this takes less than 2 minutes on high speed. Stop the mixer regularly to scrape down the sides and bottom of the bowl; this will ensure a homogenous mix.
 4. Add the eggs in four to six increments. After each addition, allow the mixer to turn for a minute or more to incorporate eggs; in smaller batches the time between egg additions will decrease. It is sufficient to wait for the eggs to be fully incorporated into the butter-sugar mixture.
 5. Scrape down the sides and bottom of the bowl between egg additions. Continue adding the eggs until they are fully incorporated.
 6. Stop the mixer, and then add the flour all at once. Mix on low speed to just incorporate the flour.
 7. Scrape the bowl several times to ensure thorough mixing. If you are adding a solid garnish, it is at this moment when it should be added.
 8. Do not overmix. This will cause the gluten in the flour to develop, negatively affecting the product. In cakes such as pound cake, it will produce a dense cake, and in cookies, it will cause them to spread too much when they bake.

THE CUSTARD METHOD

A custard is defined as a dairy product that is thickened with eggs (crème brûlée, crème anglaise, crème caramel, flan, quiche) or with eggs and starch (pastry cream, chocolate pudding). It is a usually sweet, very moist, tender gel of egg protein. Custards are typically classified as boiled, stirred, and baked and are grouped in this book under the boiled custard or pastry cream, baked custard, or stirred custard or anglaise methods.

A boiled custard is thickened with eggs and cornstarch over direct heat. The idea is that heat will coagulate the proteins in the starch and gelatinize the cornstarch, which will in turn thicken the liquid, which is generally milk. The mixture, in theory, will have to boil for this to happen, but as you will read in the method below, boiling is not necessary. There is a way to make a thick, smooth pastry cream without submitting it to intense heat. Because we do not need to boil this custard, it is not necessary to call it a boiled custard; we will simply call it pastry cream.

This method can get extremely complicated if you do not follow the steps to the most exact detail. It is not easier than the traditional boiled custard method; it is different and not without its complications. However, it turns out a superior-quality custard with a very smooth mouthfeel.

There are some cons to this method. The first is that there is an enzyme in the egg yolk called amylase that breaks the cornstarch in the pastry cream down into sugar (retrogradation). The only way to neutralize this enzyme is by boiling the egg yolk, which can be done with the

boiled custard method. However, the custard made by the following method will not be affected within 48 hours of making the pastry cream. Making too much pastry cream is not necessarily ideal, so this method is well suited for the pastry shop. The second con is that this custard is cooked until all the proteins are just cooked and no further, which means that the addition of a flavored liquid such as rum could potentially loosen the consistency of the custard too much.

Stirred custards are similar to boiled custards in that they are cooked over direct heat, but they differ in that they do not need to boil to reach the desired consistency (between 80°C/175°F to 85°C/185°F) and are thickened only by eggs. The most common example is crème anglaise.

Baked custards use only eggs and, as the name indicates, are baked in order to coagulate the egg protein. They are usually baked inside a ramekin in a hot water bath in an oven between 135°C/275°F and 160°C/325°F.

THE BOILED CUSTARD OR PASTRY CREAM METHOD IS AS FOLLOWS:

1. **Warm the eggs to 21°C/70°F in a bowl over a hot water bath. Set aside. This is an important step, since it will help the egg yolks coagulate faster than if they were refrigerator cold (see Step 5).**
2. **Pour the first amount of milk in a deep pot or rondeau. It should be deep enough to hold the milk when it is at a rolling boil. Add the full amount of sugar, along with any flavors (vanilla, coffee, and so forth).**
3. **In a small bowl, combine the cornstarch with the second, smaller amount of milk. Mix well. Whisk in the tempered egg yolks.**



Warm the first amount of milk along with the sugar and any flavorings in a large deep pot. Bring the mixture to a rolling boil.



Dump the milk in one motion into the egg, second amount of milk, and cornstarch mixture, whisking vigorously for 1 minute without stopping.



The finished pastry cream will be thick, smooth, and glossy.

4. Pour through a fine-mesh sieve into a large bowl. The bowl should be large enough to hold the entire amount of milk that is in the pot, but it should not be so big that it cools down the hot milk too much once it is added to the bowl.
5. Bring the milk and sugar to a rolling boil. Let it boil for 10 seconds, and then, in one motion (very important step: It must be one dumping motion, not a slow pour), dump it into the bowl with the yolks, cornstarch, and milk while whisking vigorously (preferably another person is doing the whisking while you dump). It is imperative that you do not hesitate when dumping the milk in one motion and that you do not use a slow pour; this is necessary in order to bring the temperature of the ingredients in the bowl up high enough to coagulate the protein in the egg yolks and gelatinize the cornstarch so it will thicken. Stir for about 1 minute without stopping. This is another very important step; if you stop even for a second to switch hands because your arm is tired, it may not work out.
6. Cover the pastry cream with plastic wrap and let it cool down over an ice water bath.

NOTE Common examples of items made from this method are pastry cream, puddings, and coconut cream pie base.

The Baked Custard Method

There are two approaches to this method. The first should be used if the base is going to be baked right away, and the second if the base is to be reserved to cook at a different time.

METHOD 1 IS AS FOLLOWS:

1. Preheat a convection or static oven to 135°C/275°F.
2. Place the ramekins (or other vessel in which the custard will be baked) in a sheet pan or hotel pan. The ramekins or the baking vessel should be shorter than the sheet pan or hotel pan, because you will have to pour water into the pan, and the ramekin or baking vessel needs to be surrounded by water to bake the custard properly.
3. In a sauce pot, combine all of the milk (or the milk and heavy cream mix) with half the sugar and any flavorings (vanilla, cinnamon, and so forth).
4. Combine the egg yolks and the other half of the sugar in a bowl. The bowl should be large enough to hold all of the components of the recipe.
5. Bring the milk (or milk with heavy cream) to a boil. Turn off the heat, and slowly pour all of this liquid into the bowl with the egg yolks and sugar while whisking. This process is known as tempering the egg yolks, in which the eggs are brought up to a high temperature without coagulating the proteins in them, which would result in a lumpy base.
6. Pass the mixture through a fine-mesh sieve. Pour into the prepared ramekins or vessel. A funnel gun works well for portion control. Fill nearly to the top.
7. Place the sheet pan or hotel pan in the oven. Pour hot water into it, being careful not to get any into the custard base. The water should come up to the same level the custard is inside the ramekins or baking vessel. If it is too low, the “exposed” custard will overbake, since it will come into direct contact with the heat from the oven.

8. **Bake until you obtain a gelatinous jiggle.** This means is that if you tap or gently move the ramekins or baking vessel, the custard will jiggle. This is because the protein in the eggs has coagulated just enough to have set but is still smooth and elastic. If it still sloshes around, it means the custard needs to bake further. If it is beyond a gelatinous jiggle and the surface does not look smooth, the custard is overbaked, and at this point there is no way to fix it.
9. **Once the custard has baked, take the sheet pan or hotel pan out of the oven (carefully so as to not spill any water into the ramekins), and take the ramekins or baking vessel out of the water. Place them on a clean sheet pan and let them cool at room temperature. Once they are cool, reserve refrigerated, covered well with plastic wrap. Discard after 2 days.**

NOTES *Some chefs prefer to cover the hotel pan with foil, which can in fact speed up the baking process. This is not a bad practice, but it will add moisture to the surface of the custard, and that can be detrimental for items like crème brûlée, since it will be very complicated to get the sugar to caramelize over a wet surface. However, this method works well if you are pressed for time.*

METHOD 2 IS AS FOLLOWS:

1. **Prepare an ice water bath. Infuse the milk (or milk and heavy cream mixture) with the desired flavor; stir in the sugar while it is hot in order to dissolve it completely. Pass through a fine-mesh sieve. Cool the liquid in the ice water bath.**
2. **Once it has cooled down completely, stir in the egg yolks using a whisk. Pass the custard base through a fine-mesh sieve. Reserve refrigerated in an airtight container for up to 5 days.**
3. **To bake the custard, follow Steps 6 through 9 of the previous method (except do not pass the custard through a fine-mesh sieve, as that has already been done).**

NOTES *This second method takes longer to bake than the first method, but the advantage to it is that you can make a large amount of base ahead of time and use it as you need it. Try to refrain from making the base using the first method and then cooling it down for future use, since this will start the coagulation process in the yolks and, in the end, will not yield ideal results. The general rule is that eggs should only be heated or cooked once.*

Other baked custards, such as pumpkin pie, cheesecake, or quiche, for example, simply require that the base ingredients be mixed in well with eggs (or egg yolks alone) and then baked. These items will not require the use of a water bath, which would prevent the crust from baking properly. Common examples of custards made using this method include crème brûlée, crème caramel, and its Latin cousin, flan.

The Stirred Custard or Anglaise Method

This method refers to the stirring motion that is necessary to cook this custard over a direct heat source (flame or induction). This type of custard is fully finished in a pot on the stove top. The stirring is done with either a wooden spoon (traditionally) or a whisk. A whisk covers more area than a spoon does and thus distributes heat more efficiently and evenly.

THE STIRRED CUSTARD OR ANGLAISE METHOD IS AS FOLLOWS:

1. Prepare an ice water bath. In a sauce pot, combine all of the milk (or the milk and heavy cream mixture) with half the sugar and any flavorings (vanilla, cinnamon, and so forth).
2. Combine the egg yolks and the other half of the sugar in a bowl. The bowl should be large enough to hold all of the components of the recipe.
3. Bring the milk (or milk with heavy cream) to a boil. Turn off the heat, and slowly pour all of this liquid into the bowl with the egg yolks and sugar while whisking.
4. Return this mixture to the sauce pot and cook over medium-low heat, stirring constantly with a whisk.
5. Stir until the base has reached a maximum temperature of 85°C/185°F. Maintain this temperature long enough to thicken the custard until it reaches what is known as the nappé stage (anywhere between 3 and 5 minutes; it depends on the size of the batch you are making). Nappé means “coated” and what it has to coat is the back of a spoon. You are supposed to be able to run a finger through the sauce and it will leave a trace. In other words, if it were not quite yet ready to come off the stove, your finger would not be able to leave a trail, the liquid on the spoon being so loose that it would cover any trace of a trail. Evaluate the custard visually—does the custard look like it has thickened from its original state? Has it reached 85°C/185°F? Temperature and consistency are your best indicators of doneness.
6. Once you have reached the correct thickness/temperature, pass the liquid through a fine-mesh sieve and cool it quickly over the ice bath.
7. Once the custard has cooled, place it in an airtight container and refrigerate it for up to 4 days.

NOTE *This method is used most notably for custard-base ice creams and crème anglaise. A citrus curd can also be considered to fall into this category, but the difference is that a curd is mixed and cooked over a hot water bath, not directly inside a pot over heat.*

FOAMED PASTRY PREPARATIONS

This method refers to the properties of an egg foam (either whites or yolks or whites and yolks) used for a batter. There are three different methods within the foaming method: the cold foaming method, the warm foaming method, and the separation foaming method. Each method has a specific purpose.

First, what is a foam? A foam is the dispersion of a gas or air in a liquid. Proteins in the egg whites and/or egg yolks are unfolded through beating at the interface between air and liquid. The main function of foamed eggs is to give volume, texture, structure, and grain to a batter. Egg whites will produce a lot more volume than egg yolks do, but sometimes a batter will call for both of these foams. Egg white can be whipped to eight times its volume, while egg yolk can be whipped to only four times its volume. The reason for this is because egg yolks contain large amounts of fat, which inhibits the intake of air. When egg yolks are whipped to their full

volume, it is called the *ribbon stage*, because if you lift the whip or whisk away from them, the strand that is dripping from it will form what looks like a ribbon over the surface of the whipped yolks. The color of the yolks will also be a very pale yellow on account of all of the air that has been incorporated into them.

It is important to whip ingredients to the correct volume, especially when it comes to foamed egg whites. Underwhipped egg whites will produce a coarse batter with low volume, while overwhipped whites will curdle from extensive protein coagulation; this coarseness will prevent the foam from being uniformly and smoothly folded into other ingredients in a batter. The goal of a proper foam is to obtain the largest amount of volume for a batter that it could not achieve on its own (without the foam).

In order to obtain the ideal egg white foam, egg whites should be beaten at room temperature, but cold whites will quickly warm up through friction as they whip anyway, so letting egg whites sit out to temper before whipping them, or warming them over a warm water bath, is not absolutely necessary for a good foam. Do use a clean stainless-steel bowl (large enough to hold the foam at its full volume) and a clean whisk or whip. Plastic bowls are not recommended since they are porous and can harbor foam “enemies” such as fat and other impurities. Finally, whites should have no traces of yolk or other foreign proteins (egg shell, grease, and so forth). Tradition dictates that old egg whites whip better, since they seem thinner or more watery, and this is true to an extent, but older eggs are also alkaline (as opposed to acidic), which affects the stability of the foam; in other words, the foam won’t last very long at its full volume. Acidity, which is found in fresh eggs, produces a much more stable foam. Some ingredients can be added to help with the foaming process. For example, an acid such as cream of tartar helps stabilize foams. Adding powdered egg whites also helps stabilize a foam, since it gives the whites more of the proteins that trap air, thus increasing the foam’s air-trapping power. Sugar also helps with stabilizing the foam, so long as it is added at the right time. Add the sugar when the whites have reached about half their volume, and then continue to whip until they have reached their full volume. When sugar is added at the beginning, it can extend the foaming time (the time it takes for the whites to reach their full volume), which will result in what feels like a denser meringue, but this is only because the prolonged whipping time has made the air bubbles smaller than their normal size. The volume will be the same. If the sugar is added when the whites have reached almost their full volume, the sugar may not dissolve completely. This sometimes results in a meringue that weeps moisture, since the large sugar crystals pull moisture from the egg whites (the term *hygroscopic* refers to the ability that sugar and salt have to pull water away from moist ingredients), resulting in large drops of water. Meringue weeping is also caused by overwhipping the meringue; the overcoagulated proteins literally squeeze the water out of the meringue.

THE COLD FOAMING METHOD IS AS FOLLOWS:

- 1. Beat the egg whites until they have quadrupled in volume, then gradually add the sugar.**
- 2. Continue beating until the egg whites have reached eight times their original volume.**
- 3. When the whites have reached full volume, the sifted dry ingredients are gently folded in.**

NOTE *Examples of items made with this method are angel food cake and French macarons.*

THE WARM FOAMING METHOD IS AS FOLLOWS:

1. Place the whole eggs and sugar in a mixing bowl over a simmering water bath and whisk until they reach 50°C/120°F. Beat this mixture until it quadruples in volume.
2. Gently fold the sifted dry ingredients into the egg mixture.
3. At this point, pour a small amount of batter into a separate bowl. Temper the melted, but cooled, butter (or oil) into the batter, and then fold this mixture into the remaining batter.

NOTE *Génoise (or sponge cake) is the most common example of an item made using this method.*

THE SEPARATION FOAMING METHOD IS AS FOLLOWS:

1. Separate the eggs.
2. Place the egg whites in the bowl of an electric mixer fitted with a whip attachment, and beat on high speed until they reach medium peaks. Slowly pour in the sugar, and continue beating until the whites reach stiff peaks.
3. Beat the egg yolks in a mixing bowl with sugar until they quadruple in volume (ribbon stage).
4. Gently fold the dry ingredients into the whipped yolks.
5. Gently fold the whipped whites into the previous mixture.
6. Fold melted, but cooled, butter (or oil) into the mix.

NOTE *Joconde, the cake used to make a classic opera cake, is made with this method.*

From all of these complicated methods, we go to an overly simple one created by Ferran Adrià. In his method, all of the ingredients are combined in a bowl with a whisk, and then they are passed through a fine-mesh sieve. This batter is placed inside a whipped cream canister, which is then filled with CO₂. This gas aerates the batter in a matter of seconds. Once the batter sits in refrigeration for a few hours, it is then portioned into plastic cups, which are heated in the microwave for about 45 seconds. The result is a very airy sponge cake, not at all like a génoise.

The downside to this method is that you can only “cook” small portions at a time. And also, it is not a replacement for any of the cakes mentioned in this method. A regular génoise tastes much better, depending on the recipe.

NOTE *The proper method for folding egg whites into a batter and anything else is as follows:*

Fold foamed whites into a mix (batter) by pushing a rubber spatula down the side of the mixer bowl, then drawing it up the center of the bowl and folding some of the lower layer on top (forming the letter “U”), while turning the bowl in the opposite direction with your other hand to optimize the amount of foamed egg that is being folded into other ingredients.

THE MERINGUE METHODS

Alphabetically, meringues should not follow the foaming method, but logistically they will. The reason for this is because we continue on the same principles, that is, the use and purpose of the foamed egg white. In this method, the foamed egg white can be used on its own, or it can be incorporated into another ingredient, either to form a batter or to make a ready-to-eat pastry preparation such as a crème Chiboust.

There are three categories of meringue: French or common, Swiss, and Italian. They are also classified as uncooked meringues (French) and cooked meringues (Swiss and Italian). In general, the ratio of egg whites to sugar for meringues will be 1:2, but this depends on what they are being used for, so it is not written in stone. The sugar will act as a stabilizer for the foam, and the more sugar, the more stable the foam.

Typically, a meringue will be whipped until it reaches its largest volume, or eight times its original volume. This is also known as the stiff-peak stage. Egg white foams can be whipped to three different stages, depending on their use. The first stage is the soft-peak stage, when the foam barely holds its shape. The second stage is the medium peak stage, when the foam can hold its shape briefly before dropping, and then there is the third and final stage, the aforementioned stiff peaks, in which the foam will completely hold a peak and not move. After this stage, the foam has been overwhipped and will look curdled.

The French Meringue Method (Uncooked Meringue)

This is the method used in the cold foaming method and the separation foaming method. It is the simplest method for making a meringue.

THE FRENCH MERINGUE METHOD IS AS FOLLOWS:

- 1. Place the egg whites in the bowl of an electric mixer fitted with a whip attachment. If using an acid such as lemon juice or cream of tartar (the acid will promote stability in the foam), it should be added at this time.**
- 2. Whip the whites on high speed. When the whites have reached half their final volume (they will have quadrupled in size), slowly pour the sugar in down the side of the bowl. Ideally, granulated sugar such as superfine or bakers' is recommended, because the smaller the crystal, the faster it will dissolve into the whites.**
- 3. Continue to whip until the whites have reached the desired volume. This desired volume is not always necessarily eight times the original volume. It could be slightly less. When a French meringue is whipped to full volume or stiff peaks, it can be difficult to fold it into another component smoothly and efficiently, since the foam will be too hard and stiff to incorporate into another equally dense or denser preparation. Whipping to maximum volume is not a problem if the meringue is to be used on its own (as a crisp meringue), but it can be an issue if the meringue is to be folded into another component. So if folding into another component, don't whip to full volume; whip until just under full volume.**

NOTE This method can be used for French macarons and soufflés, for example. Raw eggs should never be used unless the egg whites are pasteurized, and even then, this foam is not permanent unless the proteins in the egg whites have been coagulated by heat.

The Swiss Meringue Method (Cooked Meringue)

This method requires the use of heat.

THE SWISS MERINGUE METHOD IS AS FOLLOWS:

1. Combine the egg whites with the sugar the bowl of an electric mixer. Place the bowl over a hot water bath and stir with a whisk until the mixture reaches between 57°C/135°F and 60°C/140°F. Be careful to not exceed this temperature, because doing so will coagulate the egg white proteins and result in a lumpy meringue. This process helps dissolve the sugar and makes the egg whites safe for consumption.
2. While the mixture is hot, attach the bowl to the mixer fitted with a whip attachment and beat until it has reached the desired volume. At this point, it can be folded into another preparation or dried to obtain a crisp meringue.

The Italian Meringue Method (Cooked Meringue)

This method also requires the use of heat and is the most complicated one. For Italian meringue, combine the egg whites when they have reached their full volume with sugar that has been cooked to the soft-ball stage (see cooked sugar methods on page 47). The challenge is to coordinate these two events.

THE ITALIAN MERINGUE METHOD IS AS FOLLOWS:

1. In a sauce pot, combine the sugar with enough water to moisten all of the sugar, typically 4 parts sugar to 1 part water. Turn the heat to high. Meanwhile, prepare an ice water bath. Cook the sugar to between 115°C/240°F to 121°C/250°F.
2. Beat the egg whites in the bowl of an electric mixer fitted with a whip attachment on medium speed. Before the egg whites reach their full volume, the sugar should have reached the desired temperature. If not, turn the mixer down to low speed.
3. When the sugar reaches the required temperature and the egg whites are not yet at their full volume, shock the sauce pot in the prepared ice bath for a few seconds. This is only to stop the sugar from cooking further. If, however, the sugar is at the correct temperature and the egg whites are at their full volume, just pour the sugar directly into the foamed whites. It is important to follow a few safety precautions. When pouring the sugar into the whipping whites, turn the speed of the mixer down to medium and pour the sugar down the side of the bowl. If the sugar is poured over the fast-moving whip, the hot sugar may very well splatter.
4. Continue to whip until the meringue has cooled. At this point, it can be incorporated into another preparation or dried in an oven to obtain a meringue.

NOTE This method is used for Italian buttercream (the butter is to be added soft and while the meringue is still semi-warm so that the butter can be fully incorporated), crème Chiboust, and cooked-sugar French macarons, among other examples.

AERATED DESSERTS UTILIZING FOAMS

This method is for preparations that contain one or up to three different foams, from egg whites, egg yolks, whole eggs, and/or heavy cream. These items include mousses, creams (which are traditionally called “Bavarois” or “Bavarian,” but in this book they will be referred to as “creams”), semifreddo, parfais, soufflés, bombes, Chiboust, diplomat, sabayon (or zabaglione), foams (or *espumas*), and Chantilly. The foams are used mainly to add lightness and a smooth texture. Some of these items can be simply refrigerated, or they can be frozen.

KEY POINTS TO CONSIDER WHEN MAKING AERATED DESSERTS:

- The flavor base will always be made first, before any foamed components, and can be what is known as a *bombe* (see page 16). Ideally the flavor base should be tepid or slightly warm. If adding gelatin and the base is too cold, the gelatin will set on contact; if the base is too hot, whipped heavy cream will melt when it is added.
- If using heavy cream, it will only whip properly if it is cold enough (between 1°C/33°F and 4°C/39°F). Any warmer and the fat in the cream will be too soft to be able to hold air bubbles. When whipping heavy cream, it is not a good idea to whip it completely stiff. If it is too stiff, you will have the same problem as you find with very stiff egg white foams. They do not combine very well with other components, and the result is not very smooth. Whip the cream to slightly under medium-stiff peaks to be able to fold it in easily and obtain a smooth end product. Once the cream has been whipped, it needs to be kept cold in order to maintain the air bubbles; if left at room temperature, the cream will soften and deflate.
- The consistency of the foam is crucial to an even mixture. If the egg white foam is whipped very stiff, you will not be able to fold it into the flavor base.

THE PROPER FOLDING PROCEDURE IS AS FOLLOWS:

1. As soon as the foam has reached the desired volume, it should be folded into the remaining ingredients. Do not wait to fold in the foam because even though it might be stable enough for a few minutes, you want to take advantage of the maximum volume you have obtained. The longer the foam sits, the more it will deflate, even if it isn't perceptible.
2. Place half of the foam on top of the flavor base. Bring a rubber spatula or bowl scraper down the side of the bowl, all the way down to the base, and then bring it up through the center of the bowl as you curve your hand upward. The motion will resemble the letter “J”. At the same time, spin the bowl a quarter turn toward you with your free hand every time your other hand performs the “J” motion. This will maximize the amount of the foam that is folded into the flavor base and will result in the least amount of deflation. It is more effective than if you didn't turn the bowl. You have to be well coordinated to perform this action correctly, but even if you are not, practice helps.
3. Perform the same folding motion with the remaining foam. The foam is folded in two additions to prevent a decrease in volume; if you try to fold in all the foam at once, there will be a significant amount of air knocked out by the time all of the ingredients are incorporated. With two additions, the mixture will loosen up with the first addition, and the second addition will incorporate with greater ease.

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