



Gastronomixs

Sponge cake

Whitepaper

All you need to know about the lightest, fluffiest, and most popular cake among chefs



Whitepaper contents



Introduction	03
What is a sponge cake?	03
History	04
List of equipment	05
Using the right cartridge	06
The traditional recipe explained	07
Step by step	08
What can go wrong	09
Basic recipes	10
Special variants	15
Questions and answers	17

Introduction

The techniques in the kitchen are often centuries-old, tried-and-tested methods. But sometimes, a new technique arrives on the scene. The technique for using a siphon and microwave to make a sponge cake was developed less than fifteen years ago in the kitchen of El Bulli.

Yet, this newly developed method has already become a classic preparation technique. This comes as no surprise, as you can use this technique to create an extremely light and airy cake that can be used in both sweet and savoury dishes in no time and without needing too much experience.

So, there are plenty of reasons to find out more about it. After reading this white paper, you will know all there is to know about sponge cakes! A whitepaper is usually an in-depth report on a specific topic that often sets out a problem and provides a solution. It is often written by specialists within a particular field.

Why is there a white paper on sponge cakes?

For the simple reason that it is a frequently sought component on Gastronomixs. The basic sponge cake component has topped the list of most-viewed components for several years now.

After reading this whitepaper, you will know all there is to know about sponge cakes!

What is a sponge cake?

The term 'sponge cake' has become part of the jargon used by professional chefs. It refers to an incredibly light and airy cake made using a siphon and microwave.

However, if you search for 'sponge cake' on Google, you will find something very different. The original is nothing other than a basic cake batter that is used as a basis for cakes and pastries. **The Victoria sponge cake** is the best known version and consists of a layer of sponge sliced horizontally and filled with butter cream and strawberry jam.

The sponge cake that we are talking about was named **sponge cake M** by the men of El Bulli. The letter M stands for 'microwave', which says it all – a cake with a sponge-like structure that is cooked in the microwave. Although the microwave is not the most well-liked appliance in the kitchen, this technique has made the microwave relevant and popular again.





Ferran and Albert Adrià,
El Bulli*** restaurant

History

Once in a while, a chef comes onto the scene who does things completely differently. At the beginning of the previous century, we had Escoffier, who was later followed by the famous chefs of nouvelle cuisine, and then in around 2000 by Ferran and Albert Adrià. For the very young chefs among us: they are the founders of a culinary trend that was labelled by journalists as...

...*'molecular gastronomy'*

The origins of sponge cake

For many years, these Catalan chefs were the driving force behind El Bulli*** restaurant, which was named the best restaurant in the world by The World's 50 Best on five occasions. During each winter period, they would conduct endless experiments with new techniques and products in their kitchen laboratory (El Bulli Taller). This resulted in the creation of all kinds

of new textures including the espuma. Espuma is made using a siphon, an appliance that was also used to create the first sponge cake in 2004. This was a eureka moment for the patissier Albert Adrià, who used this technique to create a pistachio sponge cake for a dessert comprising several pistachio textures.

It was three years later when the brothers developed their second sponge cake – using black sesame – and this was followed by an entire series. This method is now one of the most frequently used techniques among chefs worldwide who still practise molecular gastronomy...

Full credit
herefore goes
to the men of
El Bulli!



List of equipment

The sponge cake has been widely embraced by chefs, as it is so simple to make and it is very easy to create your own variations. Nevertheless, there are a number of critical aspects and it is especially important to use the right equipment. What you need:

Kitchen scales

An essential piece of equipment as patisserie requires precisely measured quantities.

Strainer

Siphons can get clogged quickly, so it is extremely important to pass the batter through a strainer.

Microwave

An essential appliance for this technique. Most kitchens have a microwave and you do not need a special type. The minimum wattage needed is 900 Watt.

Siphon

Sometimes also called a Kidde, although this is a brand name. It is very important that all parts of the siphon are clean and that it is assembled correctly.

Blender

A strong blender or thermo-blender is very important for mixing the ingredients into a smooth batter.

Silicone spatula

These recipe are quite valuable, and with using about 20 grams per spongecake it's recommended not to waste a drop of this precious batter.

Cups

Paper cups that are filled 1/3 of the way up with the batter, which then expands all the way to the edge. Always pierce a hole in the bottom to allow the moisture to escape.



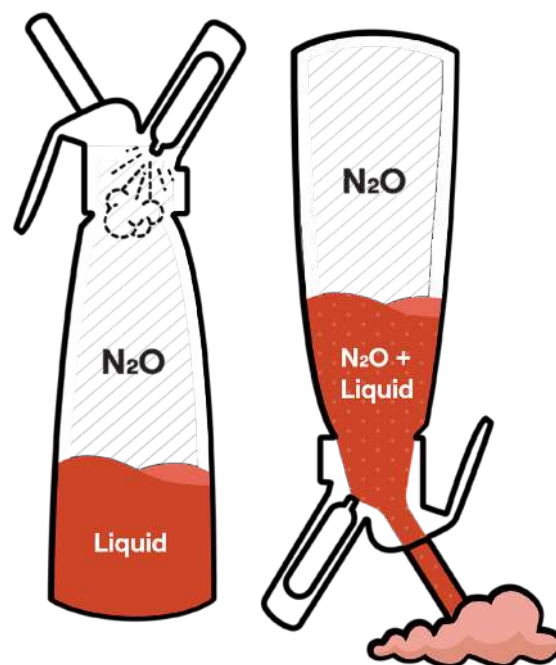
Featured equipment

No sponge cake without a siphon. The origin of the siphon can be found in the beverage industry. Soda siphons or seltzer bottles were used to turn still water into sparkling water and adapted versions were developed which made it possible to make light and airy whipped cream in an instant. The best known was the Kidde, a brand name for the most widely used whipped cream dispenser. Nowadays, there are many more brands and versions available and they are used in almost every professional kitchen. If it were not for the siphon, the Adrià brothers would never have discovered the sponge cake M.

What happens inside the siphon?

From a practical and rational point of view, the siphon does precisely the same as a whisk. With a whisk you can beat up to 40% air in liquid cream. But instead of air, the siphon is pumped full of N₂O – the most neutral gas – using a **whipping cream cartridge**.

The siphon is pressurised by screwing a cartridge onto it. This pressure creates a foam that is stabilised by the proteins and fats in the cream. Shake the siphon well to evenly spread the gas throughout the mixture. This will ensure the best result. If you are using a thicker mixture, you might need to shake for a while longer, but it's still a breeze compared to beating by hand.



Using the right cartridge

There are two types of cartridge available for the siphon and it is essential to choose the right one. The soda siphon mentioned earlier took a cartridge containing CO₂, also known as carbon dioxide. Never use this type for an espuma or sponge cake, as the recipe is sure to fail! Use whipping cream cartridges in the kitchen. These are filled with N₂O, or nitrous oxide, which is more commonly known as laughing gas. This gas has been used as an anaesthetic and as a party drug since the nineteenth century (and is not just a trend of recent years...). These N₂O cartridges should therefore be used for all types of espuma and sponge cake. As a rule, one cartridge is used for every half litre of liquid, although this is sometimes doubled for sponge cake.



The traditional recipe explained

To create a light and airy cake in the classic patisserie-sense, air needs to be incorporated into the batter somewhere in the preparation method. This can be done in various ways.

How to create a light and airy cake?

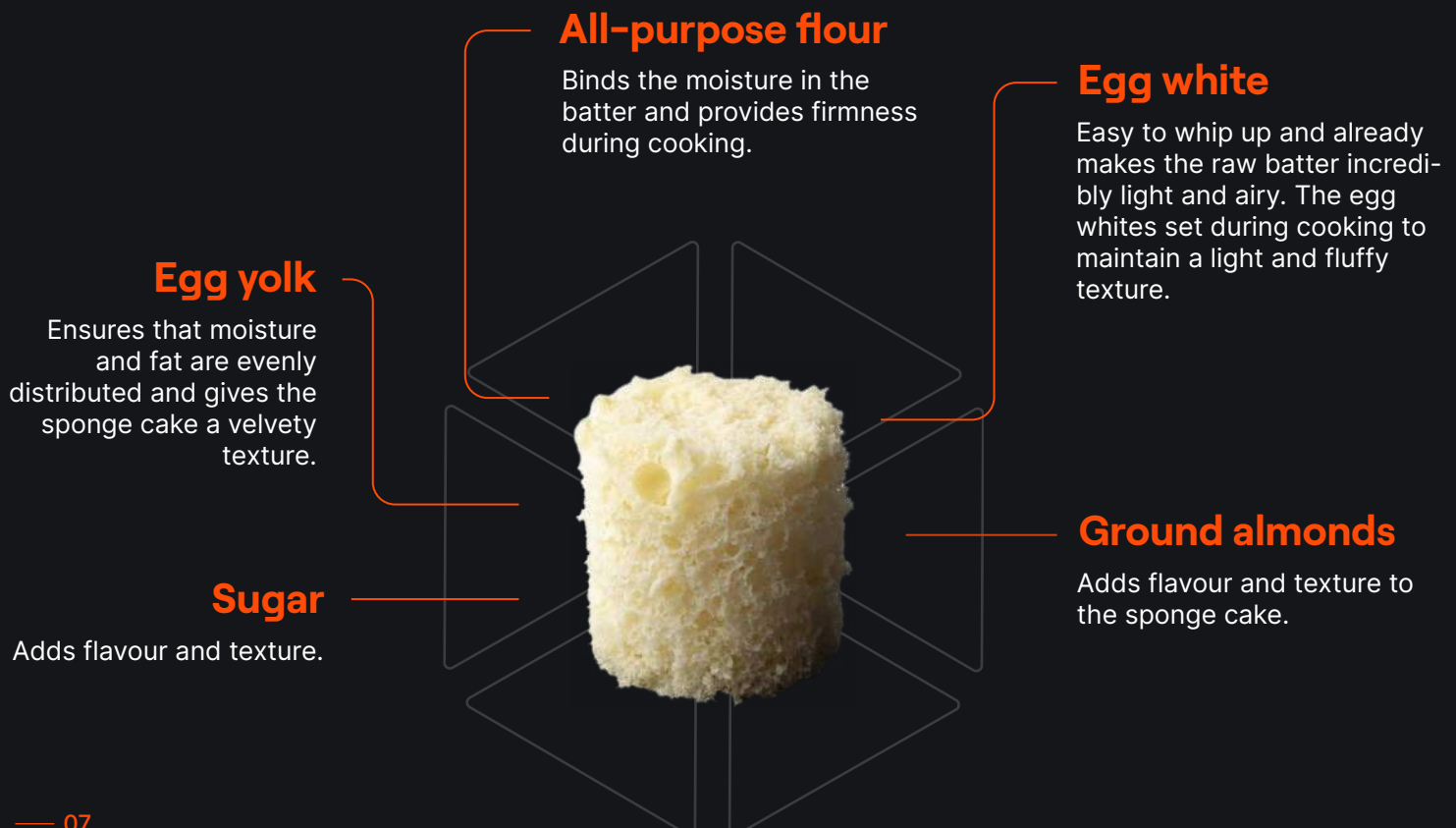
- By beating the fat with the sweetener until light and airy.
- By beating the eggs with the sweetener until light and airy.
- By beating all the ingredients together until light and airy, as is often the case for ready-made cake mixes.
- By adding a leavening agent such as baking powder or baking soda.

A light and airy result with far less effort

It takes a relatively long time to beat together ingredients until light and airy, even with a food mixer, and the whole mixture needs to be whipped up in one go. With this modern preparation technique of using a siphon for sponge cake, the air is incorporated into the batter **quickly and instantly**. This, and the endless options for variations, are the reasons for the popularity of this technique.

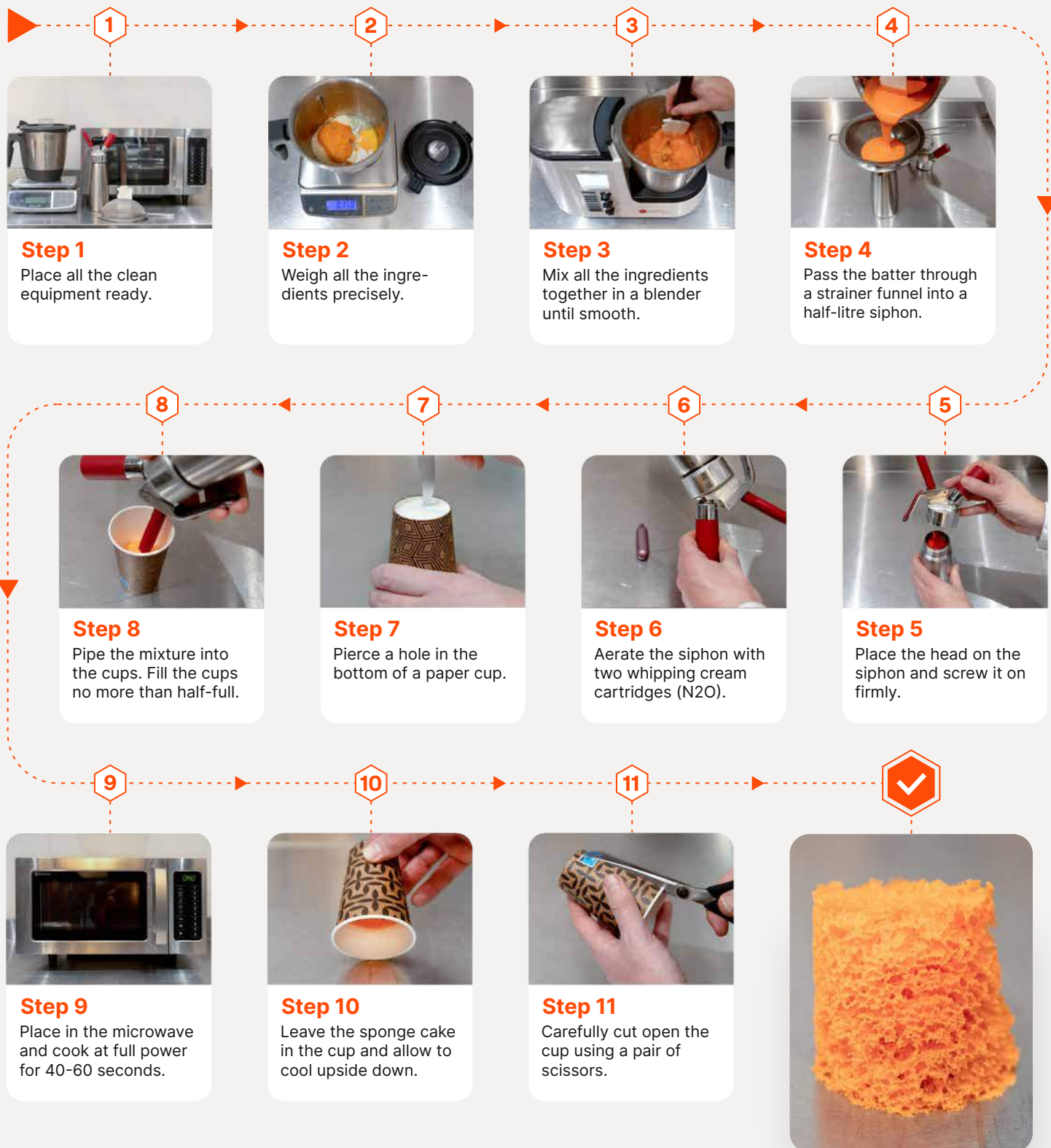
What is the purpose of the ingredients in a sponge cake?

But how does this batter and the processing of it produce such a light and airy result? A basic sponge cake recipe consists of five ingredients only. The purpose of each ingredient is explained below.



Step by step

Although sponge cake is very simple to make, there are a number of critical points where it can go wrong. The following steps should be used for all sponge cake recipes, even if they differ in terms of quantities or ingredients. If you follow this process carefully, nothing should really go wrong. Not getting the desired result with one of your own recipes? Carefully go through the steps again to see whether you can locate the problem.



What can go wrong

Not cooked long enough



Cup too full



Not enough batter in the cup



Cooked in a cup that was not pierced beforehand



Cooked in a plastic cup



Cooked for too long



Basic recipes

There are a great many sponge cake recipes about, but they can all be traced back to five basic recipes. We have listed them for you. You can use these recipes as a basis for endless variations as long as you keep to the quantities.



Basic sponge cake

This sponge cake is quick and easy to make using a siphon and microwave. The original basic recipe has been tested extensively and can be elevated by adding small amounts of herbs and spices.

Ingredients

150	g	egg white
80	g	ground almonds
80	g	sugar
30	g	flour
60	g	egg yolk

Preparation method

- Mix all the ingredients in a blender until smooth.
- Sieve and then pour into a half-litre siphon.
- Aerate with 2 whipping cream chargers (N2O).
- Fill the perforated cups to no more than half way with the mixture from the siphon. Beware: every microwave acts slightly different. You might need to test and adjust timing according to your specific microwave.
- Place in the microwave at full power for 40 seconds.
- Allow to cool upside down.
- Cut open the cups to remove the sponge cake.



Sponge cake with vegetable purée

A variation of the basic sponge cake with the addition of a vegetable purée or coulis, in this case beetroot.

Ingredients

50	g	ground almonds
100	g	red beets, cooked
125	g	egg white
80	g	egg yolk
50	g	sugar
65	g	flour
12	g	beet reduction

Preparation method

- Combine all ingredients in a blender and purée until fine.
- Push through a sieve and transfer to a 1/2-litre siphon.
- Aerate with two cartridges of laughing gas (N₂O).
- Take a number of paper cups and prick a hole in the bottom of each.
- Fill the cups to 1/3 with the batter and cook for 50 seconds in the microwave oven.
- Allow to cool upside-down and then remove by cutting the cups open with the scissors.

Variations

Simply replace the beetroot with carrot or sweet potato. For more depth of flavour, add some spices to taste!



Savoury sponge cake

A bright green, savoury sponge cake in which baking powder is added to create a light and airy texture. Parsley is used in this version, but you can also use a different herb.

Creation of Ben Murphy, Launceston Place, London, United Kingdom.

Ingredients

190	g	water
62	g	butter
124	g	parsley
120	g	flour
6	g	baking soda
5	g	salt
112	g	egg white
75	g	egg yolk

Preparation method

- ▶ Heat the water and butter in a pan until the butter has just melted. Allow to cool to room temperature.
- ▶ Add all the ingredients, except for the butter and water, to the thermoblender and blend.
- ▶ Add the water and melted butter and continue to blend for a further minute.
- ▶ Using a siphon with two gas cartridges, add the mixture and shake until the mixture comes out thick.
- ▶ Fill a polystyrene cup half full with the mixture and microwave for one minute at maximum wattage.

Variations

Replace the parsley by a combination of leafy herbs, like chervil, tarragon, chives, or curly parsley!

Nut-free sponge cake

This sponge cake recipe is suitable for guests with a nut allergy, as we have used ground pumpkin seeds instead of almond flour.

Ingredients

150	g	pumpkin purée
160	g	egg white
80	g	ground pumpkin seeds
30	g	flour
60	g	egg yolk
2	g	salt

Preparation method

- ▶ Mix all the ingredients in a blender until smooth.
- ▶ Pass the mixture through a sieve and then pour into a half-litre siphon.
- ▶ Aerate the siphon with two whipping cream cartridges.
- ▶ Pipe the mixture into paper coffee cups in which a hole has been pierced in the bottom using a knife. Fill the cups no more than half-full.
- ▶ Place in the microwave and cook at full power for 50 to 60 seconds. Please note that every microwave is different and you will need to test carefully how long to cook this recipe for in your microwave.
- ▶ Allow the cups to cool upside down.
- ▶ Cut open the cups to remove the sponge cake.

Variations

It's easy to replace the pumpkin by any other vegetable purée e.g. parsnip, sweet potato or carrot.



Gluten-free sponge cake

The use of cornflour in the sponge cake makes it gluten-free. The two types of garlic can be substituted with a different vegetable or flavour enhancer.

Ingredients

75	g	black garlic
60	g	roasted garlic
15	g	water
160	g	egg white
80	g	ground almonds
30	g	corn starch
60	g	egg yolk
3	g	salt
1	g	black food colouring

Preparation method

- ▶ Mix all the ingredients in a blender until smooth.
- ▶ Pass the mixture through a sieve and then pour into a half-litre siphon.
- ▶ Aerate the siphon with two whipping cream cartridges.
- ▶ Pipe the mixture into paper coffee cups in which a hole has been pierced in the bottom using a knife. Fill the cups no more than half-full.
- ▶ Place in the microwave and cook at full power for 50 to 60 seconds. Please note that every microwave is different and you will need to test carefully how long to cook this recipe for in your microwave.
- ▶ Allow the cups to cool upside down.
- ▶ Cut open the cups to remove the sponge cake.

Variations

For an even deeper flavour profile, try using smoked garlic instead of roasted garlic.

Special variants

All components at Gastronomixs have been developed and/or tested extensively in our Test Kitchen. This saves you a great deal of time and frustration. Our chefs took the sponge cake as a starting point and developed a range of unique flavours for both sweet and savoury dishes. As always, you can easily create your own variations. If you would like more inspiration for sponge cakes or use it to quickly put together a new dish, take a look at **Gastronomixs**.



Beetroot and violet sponge cake

Violet sugar has a very intense flavour that is nicely balanced by the earthy taste of the beetroot. An exciting sponge cake that can be used in both sweet and savoury dishes.

Ingredients

50	g	ground almonds
100	g	red beets, cooked
125	g	egg white
80	g	egg yolk
50	g	Azuleta (Texturas)
65	g	flour
12	g	beet reduction

[See preparation method](#)

Jerusalem artichoke sponge cake

This unusual sponge cake is made using a siphon (also known as a Kidde), has the subtle flavour of Jerusalem artichoke, and is slightly sweet due to the addition of honey. This recipe is suitable for guests with a nut allergy, as we have used ground sunflower seeds instead of almond flour.

Ingredients

50	g	ground sunflower seeds	12	g	flour
125	g	Jerusalem artichoke purée	12	g	honey
			1	g	yellow food colouring
80	g	egg white	2	g	salt
50	g	egg yolk			
65	g	sugar			



[See preparation method](#)



Dill sponge cake

Dill has once again become a very popular ingredient in professional kitchens. In this recipe, the herb is incorporated in an especially delicious and savoury sponge cake.

Ingredients

190	g	water	5	g	salt
62	g	butter	112	g	egg white
124	g	dill	75	g	egg yolk
120	g	flour			
6	g	baking soda			

[See preparation method](#)

Mature cheese sponge cake

The sponge cake can be used immediately or be further dehydrated to use as a crispy component.

Ingredients

160	g	mature cheese
120	g	ground almonds
40	g	flour
250	g	egg white
160	g	egg yolk

[See preparation method](#)



Coriander and lime leaf sponge cake

A delicious savoury sponge cake with the flavours and aromas of Oriental cuisine.

Ingredients

190	g	water	120	g	flour
10	g	ginger	6	g	baking powder
1	stalk	lemongrass	5	g	salt
1		lime, zest	112	g	egg white
62	g	butter	75	g	egg yolk
80	g	coriander			
30	g	parsley			
15	g	kaffir lime leaf			

[See preparation method](#)



Questions and answers

Why does sponge cake remain airy?

Because the egg whites in the batter set in the microwave during cooking and solidify around the gas bubbles.

Can sponge cakes be used in main courses?

Sponge cakes can be used in every course depending on their sugar content. At Gastronomixs you'll find recipes with and without sugar.

For how long can you keep sponge cake?

You can keep sponge cake in an air-tight container or sealed vacuum bag for about four days. But for the best result, we recommend that you bake it fresh daily.

Can you freeze sponge cake?

Yes, you can. Seal the sponge cake in a vacuum bag without actually pulling vacuum. However, it takes more effort and is more expensive than making fresh sponge cakes every day.

Can I make a sponge cake without flour?

Yes, you can and you can make a gluten-free sponge cake in this way (see page 14). The tests we have carried out show that cornflour is a good substitute for flour.

What is the most commonly made mistake when making sponge cake?

Not passing the batter through a strainer carefully before pouring it into the siphon. Lumps in the mixture will clog the nozzle of the siphon.

What happens when the batter goes into the microwave?

The radiation rapidly heats the batter, causing the gas in the batter to expand and create air bubbles. At 63°C, the egg whites set, the batter becomes firm, and the air is trapped inside the cake. If you leave the batter in the microwave for too long, it will burn.

Can I make a sponge cake without a siphon?

Yes and no. The Victoria sponge is the classic sponge cake but you cannot compare the lightness of its texture with that of the sponge cake M for which you will need both a microwave and a siphon.

Can I add food colouring to a sponge cake?

You can add powdered or liquid food colouring. Just remember that the colour that you pour into the siphon is not the colour that will emerge from the microwave. Getting the right colour is really just a matter of trial and error. The best colour pigments come from the products themselves, such as chlorophyll and carotene.



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