

Elevating Egg Whites

Knowing when to stop whipping means airier meringues, lighter cakes, and taller soufflés

BY CAROLE WALTER

Whipped egg whites are major players in cooking and baking. They're the foundation for a wide variety of recipes, including crisp, melt-in-your mouth meringue cookies, delicate sponge cakes, and fluffy soufflés. Many cooks overbeat egg whites, believing that more is better, but this isn't so. In most instances, less is the way to go.

Many recipes, however, don't clearly explain that egg whites should be beaten to one of several degrees of stiffness, depending on how they're to be used. The key points to remember are whether or not the whites contain sugar and, if so, the amount of sugar used and when it is added to the whites. Each of these factors will influence the results.

WHY EGG WHITES RISE (AND FALL)

Beating egg whites causes the eggs' protein to form a mesh, which traps a network of air bubbles. As the whites are beaten further, the network stretches, more air bubbles are incorporated, and the volume multiplies as much as eight times. The more the whites are beaten, the stronger the network becomes—up to a point. If this structure is overworked, the air cells burst, releasing the water naturally present in the whites. The whites deflate and lose their shine, and the smooth texture separates into a curdled mass.

During baking, the air within the egg whites' cells expands, so the protein mesh must be stretchy enough to continue growing with the hot air. This rising network of protein, fueled by hot air, is the engine that makes soufflés rise above the rim.

CONTROL THE CONDITIONS

Several variables influence the successful whipping of egg whites, including the age of the eggs, the temperature of the eggs and equipment, the pace of beating, and the presence of other ingredients.

Some cooks say that aged whites whip better than fresh whites. Because older whites are thinner, they presumably whip more easily and to greater volume. However, according to Purdue University professor

Properly whipped egg whites will give rise to soufflés. Here, the author presents a perfect salmon soufflé—the result of careful whipping and folding.





Meringue is easy to make if you know just when to add the sugar. This meringue topping is fluffy and not a bit grainy because superfine and confectioners' sugar were added when the whites had reached the soft-peak stage.

William Stadelman, aged whites do whip to greater volume, but they aren't nearly as stable as fresh whites.

According to Howard Hillman, author of *Kitchen Science*, warm egg whites whip faster because they have a lower surface tension, and therefore the bubbles form with less resistance. Although eggs should be refrigerated until shortly before using and are most easily separated when cold, they should stand at room temperature for 20 to 30 minutes. But eggs shouldn't be left at room temperature for more than two hours, because the risk of bacterial contamination greatly increases (see Basics, p. 72).

No matter what degree of stiffness you're trying to achieve with egg whites, always develop the cell structure slowly to foster a stable foam. Beating too quickly creates larger air cells which break quickly.

Fats inhibit the foaming process, so it's essential that not one drop of yolk be present in the white. Always be sure that the equipment you use is thoroughly clean and free of fat.

Adding an acid, such as cream of tartar, lemon juice, or white vinegar, helps bond the cells together, giving the whites stability and smoothness. Contrary to popular belief, acid does not contribute to volume. Salt, on the other hand, reduces foam stability and is best added elsewhere. Sugar is the ingredient that has the most important effect on whipped egg whites.

ADD SUGAR FOR STRENGTH AND STABILITY

When added to egg whites, sugar is absorbed into the water that's naturally present in the whites. The sugar ties up the water molecules and slows their evaporation. This retained moisture strengthens the walls of the air bubbles, giving the proteins time to coagulate and set. Even the smallest amount of sugar will allow beaten whites to stand for a few minutes without losing their volume. Stiffly beaten egg whites containing lots of sugar will keep in the refrigerator for a few days.

The type of sugar you add depends on how you'll use the whites. Granulated, superfine, and confectioners' sugar each have different grain sizes, which may have an effect on the finished product. When

making a meringue, it's important that the sugar dissolve; otherwise, the meringue will be gritty.

For soft meringues, I use a blend of two parts superfine sugar to one part confectioners' sugar. Confectioners' sugar dissolves very quickly and gives the meringue a smooth texture. It also contains a small amount of cornstarch, which helps to absorb moisture in the egg white and prevents the cooked meringue from "weeping." However, I don't recommend using confectioners' sugar by itself because alone it can't provide the support needed. When making hard meringues, either superfine sugar or a sugar syrup can be used. Regardless of the type of sugar, it should always be added slowly, one teaspoon to two tablespoons at a time, for the whites to maintain their volume.

THE RIGHT EQUIPMENT

The mixing tool, along with the size, material, and temperature of the mixing bowl, all play a part in achieving stable whipped egg whites. Balloon whips, rotary egg beaters, and hand-held electric mixers will work for small amounts of egg whites. But when larger quantities are needed or a stiff meringue is called for, you'll want a stationary electric mixer, which offers more power. Although some food processors and blenders have special attachments for whipping, they don't aerate the whites sufficiently.

Copper bowls produce excellent whipped egg whites due to the positive reaction of this metal to the protein in the egg white. Adding an acid, such as

Look for four discrete stages when whipping egg whites.

Stage 1. During this frothy stage, the egg whites become foamy and begin to form a cohesive mass. This is the time to add the cream of tartar.





Stage 2. When the whites reach the soft-peak stage, ripples will have begun to form on the surface. As the beater is lifted, the whites will droop slightly like the beak of a bird.

cream of tartar, lemon juice, or white vinegar, produces much the same result. I prefer stainless-steel bowls, but glass bowls work fine. Plastic and wooden bowls aren't suitable because they're porous and attract fat. Avoid using aluminum bowls and tools because any acid you add to the whites to increase stability will react with the aluminum and turn the egg whites gray.

Choose a bowl to accommodate the quantity of whites to be whipped, keeping in mind that egg whites expand up to eight times their original volume when whipped. For example, four large egg whites averaging one fluid ounce each can yield four cups of meringue. Never use cold bowls, as chilled egg whites will take longer to reach full volume. Rinsing a stainless-steel bowl in warm water before using it will hasten the whipping process, and wiping it with a bit of white vinegar will ensure a grease-free surface.

WATCH YOUR WHITES

I identify four discrete stages of beaten egg whites. Many cookbooks only recognize three stages—frothy, soft (or wet) peaks, and stiff (or dry) peaks. I believe it's easier to achieve the optimum consistency if an additional stage is identified between the soft- and stiff-peak stages. My third stage, when the whites pass from soft peaks to firm peaks (but before they're stiff), gives you another set of characteristics to watch for as the whites progress. Without experience, it can be difficult to recognize these stages, and while you're waiting for the egg whites to reach the desired point, you can easily go too far and overbeat them. Knowing where your whites are on the continuum will help you pre-

vent overbeating. For savory recipes, such as soufflés, the beating should stop at the soft-peak stage. I don't believe that whites can be whipped to stiff peaks without the addition of sugar. Plain whites whipped to stiff peaks won't have enough elasticity to expand during baking. For sweet dishes, you can add sugar at the firm-peak stage and safely continue whipping to the fourth stage, when the whites stand in stiff, shiny peaks.

When to add sugar. Adding sugar at the right stage is critical. By fortifying the whites, sugar can have a dramatic effect on the amount of air they can hold. The method that consistently gives me the best results involves adding sugar one stage in advance of the stage your recipe requires. For instance, if you need firm, glossy egg whites (my third stage), you'll get the best results by adding the sugar when the whites form soft peaks (second stage). If you add the sugar too early, the cell structure will become too strong and the air bubbles won't stretch to reach their full volume. However, if you add the sugar at the last minute, the whites won't reap the benefits of the sugar's strength.

Salvaging overbeaten whites. Alice Medrich, author of the award-winning book *Cocolat*, suggests adding an extra unbeaten white to salvage overbeaten egg whites. I have tried this remedy, and it does do the job, as long as no other ingredients (including sugar) have been added.

FOLDING IN BEATEN EGG WHITES

After getting your whites to the perfect consistency, you want to maintain all that volume, so good folding technique is required. Folding is always done by hand, usually with a rubber spatula. I prefer to use a jumbo one, as it covers twice the territory in half the time. Folding should be done as quickly and

Stage 3. After only a few more seconds of beating, the whites will reach the firm-peak stage. When the beater is lifted, the whites hold a firm shape. If sugar has been added, they become glossy, as shown here.





with as few strokes as possible to prevent loss of air.

First, “lighten” the batter or soufflé base by folding in a quarter of the beaten egg whites. To begin folding, insert the spatula into the center of the batter and sweep the spatula underneath, then up the side of the bowl, across the top and down into the center of the batter again. Repeat the process, gradually turning the bowl until the two mixtures are combined. After the first quarter of the beaten whites has been incorporated and the batter lightened, you can easily add the rest of the whites in the same way. Never actually stir in the whites or the mixture will deflate.

LEMON MERINGUE PIE

Serves six to eight.

3 or 4 gingersnap cookies, crushed into fine crumbs
1 baked, 9-in. pie crust (see recipe at right)

FOR THE LEMON FILLING:

1½ cups sugar
6 Tbs. cornstarch
¼ tsp. salt
1½ cups cold water
4 large egg yolks, slightly beaten
2 Tbs. grated lemon zest
¼ cup freshly squeezed lemon juice
2 Tbs. soft, unsalted butter

FOR THE MERINGUE TOPPING:

5 Tbs. plus 1 tsp. superfine sugar
2 Tbs. plus 2 tsp. confectioners’ sugar
4 large egg whites, room temperature
½ tsp. cream of tartar
½ tsp. vanilla extract

Sprinkle the cookie crumbs on the bottom of the pie crust and set aside. Heat the oven to 325°F. Combine the sugar, cornstarch, and salt in a heavy 2-qt. saucepan. Slowly add the water, whisking until smooth. Set over low heat. Stir the mixture until it comes to a slow boil; simmer 1 to 2 min.

Stir about ½ cup of the cooked sugar mixture into the egg yolks, pour the yolks back into saucepan, and blend well. Bring the mixture back to a slow boil over low heat, stirring gently. Cook for 1 min. Don’t overmix or the filling will be-

Stage 4. Don’t go this far without sugar. This stiff-peak stage is only for sweetened whites. Even with sugar, overbeating is a danger.

A few minutes in the oven transforms plain, white meringue into a stunning caramelized dessert.

come thin. Remove the pan from the heat, blend in the zest, lemon juice, and butter, and pour the filling into the pie crust.

To make the meringue, blend the sugars in a small bowl with a whisk. With an electric mixer, beat the whites on medium speed until frothy. Add the cream of tartar, increase speed to medium high, and beat until soft peaks form when the beaters are lifted (stage 2; see top photo at far left). Beat in the sugars about 2 tsp. at a time. Add the vanilla and continue to whip at medium-high speed until the whites are glossy and stand in firm peaks (stage 3; see bottom photo at far left).

With a spoon, drop mounds of meringue in a ring around the edge of the pie and then fill in the center. Cover the pie completely, sealing in the filling. To form peaks, swirl the meringue with the back of a tablespoon. Bake until the meringue is lightly browned, about 20 min. Cool completely.

FLAKY PIE PASTRY

Yields two 9-inch pie crusts.

11½ oz. (2⅓ cups) unsifted all-purpose flour
¾ tsp. salt
½ tsp. baking powder
½ cup (8 Tbs.) partially frozen unsalted butter, cut into ½-in. cubes
½ cup (8 Tbs.) partially frozen vegetable shortening, cut into small pieces
¼ cup ice water (use ⅓ cup if you use unbleached flour)

In the work bowl of a food processor fitted with a steel blade, put the flour, salt, and baking powder, and then put the bowl in the freezer for ½ hour. Pulse for 3 seconds to



blend. Add half of the butter and half of the shortening and toss to coat with flour. Pulse four or five times. Add the remaining fats and pulse again. The mixture should have the texture of meal with some larger pieces of fat.

Start the processor and immediately pour in the water. Stop the machine as soon as the water is added. Don’t allow the dough to form a mass. Dump the dough onto a work surface. With floured hands, shape the dough into two flat disks. All the crumbs should adhere to the dough; if they don’t, add a few drops of ice water. Dust the disks generously with flour, wrap them in plastic, and chill for an hour or more. The dough will keep for three days in the refrigerator or for six months in the freezer. (To defrost, leave in the refrigerator overnight.)

Rolling and baking—Heat the oven to 425°. Butter a pie plate liberally with soft butter. On a well-floured pastry cloth, roll the pastry into a round 2 in. larger than the top of the pie plate. Fit the rolled pastry loosely into the pie plate, being careful not to stretch the dough. Trim the overhang to 1 in. and fold this under to form a wall. Flute the edge of the pastry

by pinching it between thumb and forefinger, keeping it close to the edge of the plate to help prevent shrinkage during baking. Prick it lightly with a fork. Chill for 15 min.

On a square of heavy-duty foil larger than the pie plate, make a large buttered round about the size of the pie plate on one side of the foil. Using your hands, press the buttered foil into the pastry so that the foil completely lines the shell. Fill the foil-lined plate with dried beans or baking weights.

Bake until the sides start to brown, 10 to 12 min. Gently remove the foil with the beans. If the crust is to be used partially baked, leave it on a rack to cool. If not, return it to the oven and reduce the heat to 375°. Bake for 5 min., or until the bottom and sides are golden brown. If the pastry rises in the center, gently tap the surface with a fork. When done, cool on a rack before filling.

SALMON SOUFFLE

Serves six.

4 Tbs. unsalted butter
2 Tbs. grated Parmesan
2 Tbs. minced shallots
¼ cup flour
1¼ cups hot milk
2 tsp. tomato paste
2 tsp. Dijon mustard
1 Tbs. lemon juice
4 large egg yolks
½ cup grated sharp cheddar cheese
1½ to 2 cups cooked, flaked salmon
(about 1 lb. before cooking)
1 tsp. salt
Tabasco sauce
1 Tbs. chopped parsley
7 large egg whites
½ tsp. cream of tartar



Learn to master the folding technique. Lighten the base with a quarter of the whites (left) and then gently add the rest. The reward for performing this delicate procedure will be a high rise during baking.

Put a baking sheet on rack in the lower third of the oven and heat the oven to 400°. Butter a 1½- to 2-qt. soufflé dish with 1 Tbs. of the butter. Sprinkle the bottom and sides with the Parmesan and refrigerate the dish.

Melt the remaining butter in a 3-qt. saucepan over low heat. Add the shallots and sauté lightly. Whisk in the flour and cook slowly for about 2 to 3 min., stirring constantly. Gradually whisk in the hot milk, ¼ cup at a time, mixing until smooth. Bring the mixture to a slow boil and whisk in the tomato paste, mustard, and lemon juice. Simmer for 3 min.

Put the egg yolks in a small bowl, add about a quarter of the hot liquid and whisk until smooth. Add this mixture to the saucepan. Bring the mixture back to a slow boil, stirring, and simmer for 1 min. Remove the pan from the heat and blend in the cheddar, mixing until smooth. Fold in the salmon, salt, a few drops of Tabasco, and the parsley. Make sure that the soufflé base is well seasoned to allow for the added egg whites. Let the mixture cool.

Whip the egg whites on medium-low speed until frothy. Increase the speed to medium and add the cream of tartar. Gradually increase the speed to medium high until the whites reach soft peaks (stage 2; see top photo on p. 34).

Fold a quarter of the whipped whites into the salmon to lighten the mixture. Then quickly fold in the rest of the whites. Empty the mixture into the soufflé dish.

To form the “top hat” of the soufflé, insert a spatula into the batter 1 in. from the edge. Move the spatula up and down as you turn the dish, so that you have made a complete ring around the inside of the dish.

Put the soufflé in the oven on the heated baking sheet (this helps bake the bottom) and reduce the oven temperature to 375°. Bake the soufflé until golden brown, 35 to 40 min. The top should wobble slightly. Serve immediately.

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