

Egg Foams



Egg white foams are made from whipping egg whites very quickly to add air and create volume. Airy foams add volume and an airy lightness to meringues, soufflés, and cakes like angel food cake.

The Science

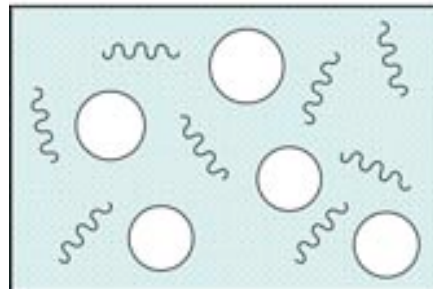
Egg whites are composed of water, protein, and some minerals and sugars. Beating them incorporates air into the whites to create what is called a colloid dispersion (gas in a liquid). Beating also denatures the egg white protein, called albumen, causing the protein to unwind and stretch out. The new shape allows albumen to coat and trap air bubbles and water, which makes the foam stiff.

Other factors also affect the formation and stability of egg white foams:

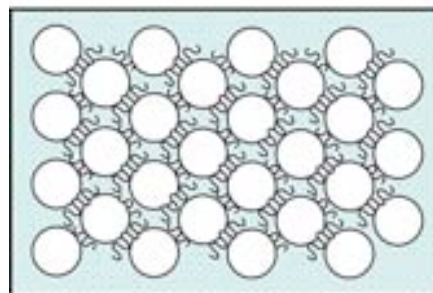
- **Fat:** Avoid getting any yolk in the whites and make sure to use clean equipment and utensils (glass, metal, or glazed ceramic), because even a small amount of fat interferes with foam formation.
- **Salt:** Adding towards the end improves flavor.
- **pH:** Adding an acid, like cream of tartar or vinegar, to egg whites as you whip them helps make the foams more stable. The acid lowers the pH and allows the less stable denatured proteins to hold water more tightly. Adding an acid will also increase the beating time.
- **Temperature:** Eggs are best beaten into foams at room temperature. They will reach a greater volume in less time than colder eggs.
- **Sugar:** Sugar is added towards the end to smooth and stabilize the foam. If added at the beginning, it will inhibit foam formation and increase the beating time.
- **Age of eggs:** Although fresh eggs are more acidic, older eggs take less time to whip because the whites are thinner and therefore easier to whip.



RAW EGG WHITE:
90% water and almost
10% protein



WHEN WHIPPED A LITTLE:
large air bubbles are mixed
into the egg white and the
proteins are denatured



WHEN FOAM IS COMPLETE:
denatured proteins are
oriented around smaller air
bubbles

A Dash of Science.com

Egg Foams



1. Foamy



2. Soft peaks



3. Stiff peaks



4. Dry peaks (overbeaten)

Foaming Technique

Separate eggs when they are cold because the cold makes them easier to separate, but once separated, cover and let them come to room temperature before beating.

Using an electric or stand mixer, beat egg whites in a mixing bowl on low speed. They will become frothy and foamy. Add an acid (if desired), increase the speed gradually to medium high, and beat until soft (almost stiff) peaks form. At this point you would add any sugar. The recipe will indicate how long you should beat the egg whites:

- *Soft peaks*: Peaks will stand straight but bend or droop slightly at the tips when beaters are pulled out of the foam. The texture is still a bit coarse (you can see some tiny bubbles).
- *Stiff peaks*: Peaks should stand upright without bending or drooping when beaters are pulled out of the foam and turned upside down. They will look thick, shiny, and glossy, but not dry.
- *Dry peaks*: These are overbeaten. The foam will be chunky when stirred, leaky, and will not easily form peaks.

Fold in the whites gently to avoid smashing the bubbles and deflating the delicate batter.

Egg Foam Rescues

- If you overbeat the whites, as long as you haven't added other ingredients you can try adding another egg white and beating until the mixture is glossy and forms peaks.
- If your meringue shell becomes too stiff and breaks, break it into large crumbs and serve with whipped cream and fruit.