

## Cream Cheese

Cream cheese is a soft, usually mild-tasting fresh cheese made from milk and cream. It is not naturally matured and is meant to be consumed fresh. Stabilizers such as carob bean gum and carrageenan are often added during industrial production. The U.S. Food and Drug Administration defines cream cheese as containing at least 33% milk fat, with a moisture content of no more than 55%, and a pH range of 4.4 to 4.9. Around 1873, William A. Lawrence, a dairyman in Chester, New York, was the first to mass-produce an unripened fresh cheese known generically as cream cheese.

The USDA standards for cream cheese define minimum fat and maximum moisture content, but within those ranges, there can be significant variation. It is not just the fat and moisture levels, but also the specific ingredients used and their proportions that make a difference. The ingredient list is a great clue, since ingredients are listed in descending order by weight. Even two brands with seemingly identical ingredients can have different textures and flavors simply due to the order in which those ingredients are combined. This can affect how the cream cheese performs in baking, cooking, or even just spreading. It's definitely something to keep in mind when choosing cream cheese for a specific recipe.

Nick Fragedakis, Program Director and Acidified Foods Process Authority, NC State University, was asked if the brand of cream cheese made a difference. His reply is as follows:

*If the product is labeled as Cream Cheese, it should fit the standard of identity as stated in [21 CFR 133.133](#). If you are asking about changing brands, will the water activity of a final product be different and require additional testing? You would hope there wouldn't be a need, but b/c there is no strictly defined amount of moisture other than the Maximum of 55% by weight, there is no way to say without collecting the data. If one brand has 30% moisture and another has 55% moisture, this may impact the final product. If the final product only uses a small percentage of cream cheese, it may not make much of a difference, but if the product is mostly cream cheese, it could impact the final water activity. There are always a lot of caveats that make it difficult to give a straightforward answer that covers all products.*

*You would also want to ensure that all ingredients match your label. Great Value Cream Cheese may have the same ingredients as Philadelphia Cream Cheese, but the ingredients' order is different, which will impact your final label.*

*A water activity of less than 0.85 will prevent pathogenic growth in a food. When processed according to validated processes, high-acid foods are shelf-stable when a final equilibrium pH is less than 4.6, and shelf-stable Low-acid foods have a pH above 4.6.*

*Best,  
Nick*

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Below are labels from 4 brands of cream cheese. Upper left is Great Value from Walmart, upper right is from Kroger, lower left is Philadelphia brand and lower right is Tillamook.



Great Value and Kroger are identical based on order of ingredients, each having three stabilizers (thickeners). Philadelphia brand has one additive and Tillamook has no stabilizers added. Marketing information for Tillamook says extra cream is added to provide a firm stable product. Price and quality are the same order - Great Value, Kroger, Philadelphia, then Tillamook.

**pH** (potential of hydrogen) is a measure of how acidic or basic a substance or solution is. pH is measured on a scale of 0 to 14. On this scale, a pH value of 7 is neutral, <7 is acidic and >7 is basic.

In food science, "pH" refers to the level of acidity or alkalinity of a food, while "water activity" measures the amount of available water in a food, both playing crucial roles in determining the potential for microbial growth and ultimately, the shelf life of

a product; essentially, a low pH or low water activity can inhibit the growth of harmful bacteria, making the food safer to consume.

**Water activity** ( $a_w$ ) of a food is the ratio between the vapor pressure of the food itself, when in a completely undisturbed balance with the surrounding air media, and the vapor pressure of distilled water under identical conditions. (<https://www.fda.gov/>)

Low-moisture foods are food products with water activity ( $a_w$ ) equal to or less than 0.85. Breakfast cereals, grains, confections such as chocolate and cocoa, dairy and egg powders, dried fruits and vegetables, honey, seeds, nuts, peanut butter, chips and other snacks, spices, and herbs are among the many examples. (<https://www.ift.org/>)

A water activity level of 0.85 or below is generally considered to prevent the growth of most pathogenic bacteria in food, meaning that by lowering the available water in a food product to this level, you can inhibit the growth of harmful microorganisms like *Staphylococcus aureus* and *Clostridium botulinum*. [Water Activity](#)

$A_w$ values	pH: < 4.2	pH: 4.2 - 4.6	pH: > 4.6 - 5.0	pH: > 5.0
< 0.88	non-TCS food*	Non-TCS food	non-TCS food	non-TCS food
0.88 – 0.90	non-TCS food	non-TCS food	non-TCS food	PA**
> 0.90 – 0.92	non-TCS food	non-TCS food	PA	PA
> 0.92	non-TCS food	PA	PA	PA

\* TCS FOOD means TIME/TEMPERATURE CONTROL FOR SAFETY FOOD

\*\* PA means Product Assessment required

The above chart demonstrates the relationship between water activity and pH.

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## \*\*\*\*\* RECIPES \*\*\*\*\*

### Traditional Cream Cheese Icing

pH 4.85

$a_w$  0.83

*Non-potentially hazardous*

### **Ingredients**

8 oz Philadelphia brand cream cheese  
1/2 cup (1 stick) lightly salted butter  
1 lb (4 cups) powdered sugar  
1 tbsp pure vanilla extract

- Let butter and cream cheese soften at room temperature
- Cream butter and cream cheese together until light and fluffy
- Add vanilla
- Add powdered sugar gradually.

### **Cream Cheese Buttercream**

*pH 4.73*

*aW 0.83*

*Non-potentially hazardous*

### **Ingredients**

- 2 lbs. of powdered sugar
- 1/3 C. warm water
- 1 1/2 t. Vanilla
- 3 oz Philadelphia cream cheese
- 7 oz. hi-ratio shortening
- Cream shortening and Philadelphia cream cheese together.
- Add powdered sugar gradually (mixture will be thick)
- Add warm water and vanilla. Mix for 5-10 minutes until light and fluffy.