

# Butter Production and its Types in Dairy Products

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## Commentary

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## ABOUT THE STUDY

Butter is a dairy product made from churned cream's fat and protein components. At room temperature, it is a semi-solid emulsion containing approximately 80% butterfat. It is used as a spread at room temperature, as a condiment when melted, and as a fat in baking, sauce-making, pan frying, and other cooking procedures.

## Production

Homogenized milk and cream contain microscopic globules of butterfat. These globules are surrounded by phospholipid and protein membranes that prevent the fat in milk from pooling together into a single mass. Agitating the cream damages these membranes, allowing the milk fats to conjoin and separate from the other parts of the cream. Variations in the production method will result in butters of varying consistencies, owing primarily to the butterfat composition of the finished product. Butter has three types of fat: free butterfat, butterfat crystals, and undamaged fat globules. Different proportions of these forms result in different consistencies within the butter in the finished product; butters with many crystals are harder than butters dominated by free fats.

Churning causes small butter grains to float in the cream's water-based portion. This watery liquid is known as buttermilk, though the most common buttermilk today is directly fermented skimmed milk. The buttermilk is drained, and the grains are rinsed with water to remove any remaining buttermilk. The grains are pressed and kneaded together. When made by hand, this is done with wooden boards known as scotch hands. This solidifies the butter and

breaks up any embedded pockets of buttermilk or water into tiny droplets. Commercial butter contains approximately 80% butterfat and 15% water, whereas traditionally made butter may contain as little as 65% fat and 30% water. Butterfat is composed of triglyceride, a trimer derived from glycerol, and three fatty acid groups.

### **Types**

Dairy products are frequently pasteurized during the manufacturing process to kill pathogenic bacteria and other microbes. Sweet cream butter is butter made from pasteurized fresh cream. With the development of refrigeration and the mechanical cream separator in the nineteenth century, the production of sweet cream butter became more common. Continental Europe prefers cultured butter, whereas the United States and the United Kingdom prefer sweet cream butter. Although cultured butter is made and sold by some dairies, particularly Amish dairies, it is sometimes referred to as "European-style" butter in the United States. In the United States, commercial raw cream butter is almost unheard of. Raw cream butter is typically made at home by consumers who have purchased raw whole milk directly from dairy farmers.

### **Clarified butter**

Clarified butter contains almost no water or milk solids, leaving almost pure butterfat. Clarified butter is made by heating butter to its melting point and then cooling it; the remaining components separate by density after settling. Whey proteins form a skin on top, which is removed. The resulting butterfat is then separated from the bottom-settling mixture of water and casein proteins. Ghee is clarified butter that has been heated to approximately 120°C after the water has evaporated, browning the milk solids. This process flavors the ghee while also producing antioxidants that help keep it from going rancid. As a result, ghee can be stored for six to eight months under normal conditions.

### **Whey butter**

As a by-product of cheese making, cream can be separated from whey instead of milk. Whey cream can be used to make whey butter. Whey cream and butter contain less fat and taste more salty, tangy, and "cheesy." They are also less expensive to produce than "sweet" cream and butter. Because whey has a low fat content, 1000 pounds of whey will typically yield 3 pounds of butter.