6.3: Milk Products ADD US

Cream

The usual minimum standard for cream is 10% fat content, though it ranges between 10% and 18%. Cream in this range may be sold as half and half, coffee cream, or table cream.

Whipping cream is about 32% to 36% in milk fat content. Cream with 36% or higher is called heavy cream. This percentage of fat is not a mandated standard; much less than this and the cream simply will not whip. For best whipping results, the cream should be 48 to 60 hours old and be cold. A stabilizer, some sugar, and flavour may be added during whipping. Before adding stabilizer, check the ingredients on the carton; some whipping creams nowadays have added agents such as carrageenan, in which case an additional stabilizer may not be necessary.

Canadian cream definitions are similar to those used in the United States, except for that of “light cream.” In Canada, what the U.S. calls light cream is referred to most commonly as half and half. In Canada, “light cream” is low-fat cream, usually with 5% to 6% fat. You can make your own light cream by blending milk with half-and-half.

In Quebec, country cream is sold, which contains 15% milk fat. If you are usinga recipe that calls for country cream, you may substitute 18% cream.

If you have recipes from the UK, you might see references to double cream. This is cream with about 48% milk fat, which is not readily available in Canada, except in some specialty stores. Use whipping cream or heavy cream instead.

Table 1 lists some of the common cream types and their uses.

Table 1 Cream types and fat content Name

	Minimum Milk Fat	Additional Definition	Main Uses
Whipping cream	32%	Heavy cream has at least 36% milk fat	Whips well, can be piped; custards, cream fillings, confectionary products
Table cream	18%	Coffee cream	Added to coffee, poured over puddings, used in sauces
Half-and-half	10%-12%	Cereal cream	Added to coffee; custards and ice cream mixes
Light cream	5%-10%		Added to coffee

Buttermilk

Inoculating milk with a specific culture to sour it
Churning milk and separating the liquid left over from the butter

There are two methods to produce buttermilk:

The second method is where buttermilk gets its name, but today, most of what is commonly called buttermilk is the first type. Buttermilk has a higher acid content than regular milk (pH of 4.6 compared with milk’s pH of 6.6).

The fermented dairy product known ascultured buttermilk is produced from cow’s milk and has a characteristically sour taste caused by lactic acid bacteria. This variant is made using one of two species of bacteria — either Lactococcus lactis or Lactobacillus bulgaricus, which creates more tartness in certain recipes.

The acid in buttermilk reacts with the sodium bicarbonate (baking soda) to produce carbon dioxide, which acts as the leavening agent.

Sour Cream

Sour cream is made from cream soured by adding lactic acids and thickened naturally or by processing. Milk fat content may vary from 5.5% to 14%. The lactic acid causes the proteins in sour cream to coagulate to a gelled consistency; gums and starches may be

added to further thicken it. The added gums and starches also keep the liquid whey in sour cream from separating.

Use sour cream in cheesecakes, coffee cakes, and pastry doughs. Low-fat and fat-free sour cream are available. Low-fat sour cream, which is essentially cultured half-and-half or light cream (and usually contains 7% to 10% milk fat), is often satisfactory as a substitute for regular sour cream in baking. These products are higher in moisture and less rich in flavor than regular sour cream.

Crème Fraîche

Crème fraîche (fresh cream) is a soured cream containing 30% to 45% milk fat and having a pH of around 4.5. It is soured with bacterial culture. Traditionally it is made by setting unpasteurized milk into a pan at room temperature, allowing the cream to rise to the top. After about 12 hours, the cream is skimmed off. During that time, natural bacteria in the unpasteurized milk ripens the cream, turning it into a mildly sour, thickened product.

An effective substitute can be made by adding a small amount of cultured buttermilk or sour cream to whipping cream and allowing it to stand in a warm spot for 10 hours or more before refrigerating. As the cream ripens from the growth of the lactic acid bacteria, it thickens and develops a sour flavour. This product is similar to sour cream, but it has a higher milk fat content.

Milk Substitutes

Milk substitutes are becoming increasingly popular as replacements for straight skim milk powders. Innumerable replacement blends are available to the baker. Their protein contents range from 11% to 40%; some are wet, some are dry-blended. Product types vary from all dairy to mostly cereal. All-dairy blends range from mostly dry skim milk to mostly whey. A popular blend is whey mixed with 40% soy flour solids and a small quantity of sodium hydroxide to neutralize the whey acidity.

Dough consistency may be a little softer if the milk in the replacement blend exceeds 3%, and this could dictate the need to increase dough mixing by at least half a minute. However, absorption and formula changes are seldom necessary when switching from dry milk to a blend, or from a blend to a blend.

For nutritional labelling, or when using a blend in a non-standardized product that must carry an itemized ingredient label, all blend components must be listed in their proper order on the label.

The Canadian Food Inspection Agency defines modified milk ingredients as any of the following in liquid, concentrated, dry, frozen, or reconstituted form:

Calcium-reduced skim milk
Casein: This a protein in milk and is used as a binding agent. Caseins are also used in wax to shine fruits and vegetables, as an adhesive, and to fortify bread. Caseins contain common amino acids. Caseinate: This protein is derived from skim milk. Bodybuilders sometimes take powder enriched with calcium caseinate because it releases proteins at an even, measured pace.

Cultured milk products: These are milk products that have been altered through controlled fermentation, including yogurt, sour cream, and cultured buttermilk.
Milk serum proteins
Ultra-filtered milk: The Canadian Food and Drug Regulations define this type of milk as that which “has been subjected to a process in which it is passed over one or more semi-permeable membranes to partially remove water, lactose, minerals, and water-soluble vitamins without altering the whey protein-to-casein ratio and that results in a liquid product.”

Whey: This is serum by-product created in the manufacture of cheese.
Whey butter: Typically oily in composition, whey butter is made from cream separated from whey. Whey cream: This is cream skimmed from whey, sometimes used as a substitute for sweet cream and butter.
Any component of milk that has been altered from the form in which it is found in milk.

Milk Powder

Milk powder is available in several different forms: whole milk, skim milk (non-fat dry milk), buttermilk, or
whey. They are all processed similarly: the product is first pasteurized, then concentrated with an evaporator, and finally dried (spray or roller dried) to produce powder.

Whole milk powder must contain no less than 95% milk solids and must not exceed 5% moisture. The milk fat content must be no less than 2.6%. Vitamins A and D may be added and the emulsifying agent lecithin may also be added in an amount not exceeding

0.5%.
Skim milk powder (non-fat dry milk) must contain no less than 95% milk solids and must not exceed 4% moisture or 1.5% fat.
Buttermilk powder must contain no less than 95% milk solids and must not exceed 3% moisture or 6% fat.
Whey powder consists primarily of carbohydrate (lactose), protein (several different whey proteins, mainly lactalbumins and globulins), various minerals, and vitamins. Whey powder is a valuable addition to the functional properties of various foods as well as a source of valuable nutrients because it contains approximately 50% of the nutrients in the original milk.

Table 2 compares the composition of milk and two powdered milk products.

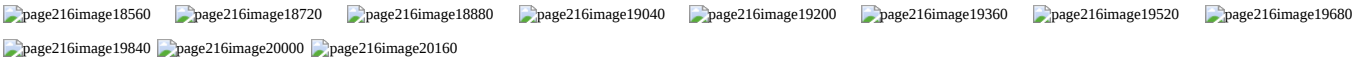
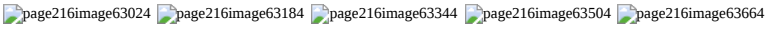


Table 2 Comparison of fresh and powdered milk products (% by weights)

	Whole Milk	Skim Milk Powder (Non-fat dry milk)	Buttermilk Powder
Milk fat	3.25	0.7	5.0
Protein	3.5	36.0	34.0
Milk sugar (lactose)	4.9	51.0	48.0
Minerals	0.8	8.2	7.9
Water	87.0	3.0	3.0
Calcium	0.12	1.3	1.3

To make 10 L (22 lb.) of liquid skim milk from skim milk powder, 9.1 L (2.4 gal.) of water and 900 g (2 lb.) of skim milk powder are required.
To make 10 L (22 lb.) of whole milk from skim milk powder, 8.65 L (2.25 gal) of water, 900 g (2 lb.) of skim milk powder, and 450 g (1 lb.) of butter are needed.

When reconstituting dried milk, add it to the water and whisk in immediately. Delaying this, or adding water to the milk powder, will usually result in clogging. Water temperature should be around 21°C (70°F).



Evaporated Milk

Sometimes called concentrated milk, this includes evaporated whole, evaporated partly skimmed, and evaporated skim milks, depending on the type of milk used in its production. Canadian standards require 25% milk solids and 7.5% milk fat.

All types of evaporated milk have a darker color than the original milk because at high temperatures a browning reaction occurs between the milk protein and the lactose. After 60% of the water is removed by evaporation, the milk is homogenized, cooled, restandardized, and canned. It is then sterilized by heating for 10 to 15 minutes at 99°C to 120°C (210°F to 248°F). Controlled amounts of disodium phosphate and/or sodium citrate preserve the “salt balance” and prevent coagulation of the milk that might occur at high temperatures and during storage.

Sweetened Condensed Milk

Sweetened condensed milk is a viscous, sweet-colored milk made by condensing milk to one-third of its original volume, which then has sugar added. It contains about 40% sugar, a minimum of 8.5% milk fat, and not less than 28% total milk solids.
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