

# متن خوانی انگلیسی (Butter Manufacture)

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## Butter Manufacture

Butter is essentially the fat of the milk. It is usually made from sweet cream and is salted. However, it can also be made from acidulated or bacteriologically soured cream and saltless (sweet) butters are also available. Well into the 19th century butter was still made from cream that had been allowed to stand and sour naturally. The cream was then skimmed from the top of the milk and poured into a wooden tub. Buttermaking was done by hand in butter churns. The natural souring process is, however, a very sensitive one and infection by foreign micro-organisms often spoiled the result. Today's commercial buttermaking is a product of the knowledge and experience gained over the years in such matters as hygiene, bacterial acidifying and heat treatment, as well as the rapid technical development that has led to the advanced machinery now used. The commercial cream separator was introduced at the end of the 19th century, the continuous churn had been commercialized by the middle of the 20th century.

### Definitions and Standards

#### Milkfat

the lipid components of milk, as produced by the cow, and found in commercial milk and milk-derived products, mostly comprised of triglyceride.

#### Butterfat

almost synonymous with milkfat; all of the fat components in milk that are separable by churning.

#### Anhydrous Milkfat (AMF)

the commercially- prepared extraction of cow's milkfat, found in bulk or concentrated form (comprised of 100% fat, but not necessarily all of the lipid components of milk).

#### Butteroil

synonymous with anhydrous milkfat; (conventional terminology in the fats and oils field differentiates an oil from a fat based on whether it is liquid at room temp. or solid, but very arbitrary).

#### Butter

a water-in-oil emulsion, comprised of >80% milkfat, but also containing water in the form of tiny droplets, perhaps some milk

solids-not-fat, with or without salt (sweet texture is a result of working/kneading during The principal constituents of a normal salted butter are fat (80 - 82%), water (15.6 - 17.6%), salt (about 1.2%) as well as protein, calcium and phosphorous (about 1.2%). Butter also contains fat-soluble vitamins A, D and E.

Butter should have a uniform colour, be dense and taste clean. The water content should be dispersed in fine droplets so that the butter looks dry. The consistency should be smooth so that the butter is easy to spread and melts readily on the tongue.

The buttermaking process involves quite a number of stages. The continuous buttermaker has become the most common type of equipment used.

The cream can be either supplied by a fluid milk dairy or separated from whole milk by the butter manufacturer. The cream should be sweet ( $\text{pH} > 6.6$ ,  $\text{TA} = 0.10 - 0.12\%$ ), not rancid and not oxidized.

If the cream is separated by the butter manufacturer, the whole milk is preheated to the required temperature in a milk pasteurizer before being passed through a separator. The cream is cooled and led to a storage tank where the fat content is analyzed and adjusted to the desired value, if necessary. The skim milk from the separator.

is pasteurized and cooled before being pumped to storage. It is usually destined for concentration and drying.

From the intermediate storage tanks, the cream goes to pasteurization at a temperature of 95°C or more. The high temperature is needed to destroy enzymes and micro-organisms that would impair the keeping quality of the butter.

If ripening is desired for the production of cultured butter, mixed cultures of *S. cremoris*, *S. lactis diacetyl lactis*, *Leuconostocs*, are used and the cream is ripened to pH 5.5 at 21°C and then pH 4.6 at 13°C. Most flavour development occurs between pH 5.5 - 4.6. The colder the temperature during ripening the more the flavour development relative to acid production. Ripened butter is usually not washed or salted.



In the aging tank, the cream is subjected to a give the fat the required crystalline structure. The program is chosen to accord with factors such as the composition of the butterfat, expressed, for example, in terms of the iodine value which is a measure of the unsaturated fat content. The treatment can even be modified to obtain butter with good consistency despite a low iodine value, i.e. when the unsaturated proportion of the fat is low.

As a rule, aging takes 12 - 15 hours. From the aging tank, the cream is pumped to the churn or continuous buttermaker via a plate heat exchanger which brings it to the requisite temperature. In the churning process the cream is violently agitated to break down the fat globules, causing the fat to coagulate into butter grains, while the fat content of the remaining liquid, the buttermilk, decreases.

Thus the cream is split into two fractions: butter grains and buttermilk. In traditional churning, the machine stops when the grains have reached a certain size, whereupon the buttermilk is drained off. With the continuous buttermaker the draining of the buttermilk is also continuous.

After draining, the butter is worked to a continuous fat phase containing a finely dispersed water phase. It used to be common practice to wash the butter after churning to remove any residual buttermilk and milk solids but this is rarely done today.

Salt is used to improve the flavour and the shelf-life, as it acts as a preservative. If the butter is to be salted, salt (1-3%) is spread over its surface, in the case of batch production. In the continuous buttermaker, a salt slurry is added to the butter. The salt is all dissolved in the aqueous phase, so the effective salt concentration is approximately 10% in the water.

After salting, the butter must be worked vigorously to ensure even distribution of the salt. The working of the butter also influences the characteristics by which the product is judged - aroma, taste, keeping quality, appearance and colour. Working is required to obtain a homogenous blend of butter granules, water and salt. During working, fat moves from globular to free fat. Water droplets decrease in size

during working and should not be visible in properly worked butter. Overworked butter will be too brittle or greasy depending on whether the fat is hard or soft. Some water may be added to standardize the moisture content. Precise control of composition is essential for maximum yield.

The finished butter is discharged into the packaging unit, and from there to cold storage.

### **Different types of butter**

#### **Sweet Cream Butter**

This is your basic butter, and the one you're probably most familiar with. It's composed of butterfat (somewhere between 65 and 80%), water and some milk solids... but let's back up a bit to how butter is actually made. You see, butter happens when heavy cream has been churned and churned, and all the tiny fat globules begin to clump together so tightly that a solid spread forms. Extra liquid that separates out during this process is called buttermilk, and can be poured off for later use. Sound easy? It is, and very rewarding at to make at home if you've got a few extra minutes and some very high quality cream on hand (a hand mixer or immersion blender helps as well!).

#### **Cultured Butter**

This butter is neither a world traveller nor the top student of your global studies class. By "culturing" heavy cream - that is, adding live bacteria to it - before churning, you get a butter with a desirable higher-fat content, making it richer and silkier to the tongue. The bacteria also gives butter a more complex, tangy flavor (mostly from lactic acid), and can aid in digestion, which is great news for those who steer clear of dairy to avoid an upset tummy. Although it's most common in Europe, cultured butter has been gaining popularity and demand in the States over the last few decades, and several grocery stores stock both salted and unsalted versions.

#### **Whipped Butter**

This butter has had milk and air whipped into it, giving it a fluffier texture. Whether you choose to buy it off the grocery shelf or make it at home, whipped butter melts and spreads more easily than regular butter, and can be a good way to "stretch" butter when serving a



crowd. It's also a great way to stretch butter for dry toast!

### **Compound Butter**

Fold in fresh herbs, garlic, or bold spices into butter, and guess what? You've got a rich, flavorful spread that's the perfect accessory to everything from grilled meats and seafood to oven-hot rolls. A scoop of herbed butter melting over grilled filet mignon, a side of melted paprika butter to serve with Low Country Boil, some cinnamon-spiced spread for your breakfast muffin... the possibilities for compound butter end only with your tastebuds and imagination!

### **Brown Butter**

Remember when we said that your basic butter is made up of butterfat, water and milk solids? Well, when you heat butter in a hot pan, the water in butter evaporates out- you'll see this happening as it begins to bubble away.

Next, you'll see the butter foam and progressively turn darker while developing dark brown flecks. This happens when the milk solids, which consists of lactose sugar and proteins, undergo the maillard reaction (the same browning reaction that gives bread its nutty crust!).

### **Clarified Butter or Ghee**

To "clarify" butter means to rid it of anything but the butterfat. Without that water, it has a longer shelf life, and without the milk solids, it has a higher smoke point for cooking. While you can buy it at the store ("ghee" is a type of clarified butter) it's very easy to clarify your own butter at home; it's similar to making brown butter, except at a lower temperature, and you'll strain out the milk solids with a cheesecloth after they've separated out onto the bottom of the pan.



**Skim:**

**Churn:**

**Hygiene:**

**Separator:**

**Anhydrous:**

**Rancid:**

**Butter grain:**

**Drain off:**

**Vigorously:**

**Flavorful:**

شیر خامه گرفته شده

کره سازی

بهداشت

خامه گیر، جداکننده

بی آب

ترشیده

دانه کره

خالی کردن آب

به شدت

خوش رایحه

