

How Cheese Works by Shanna Freeman

Cheesemaking Basics

All cheese starts with milk. Most cheese is made with **pasteurized milk**. Some cheese *connoisseurs* argue that **raw-milk** cheese tastes better, and some small **dairies** produce raw-milk cheese (although to be legal in the United States, the cheese has to be aged for 60 days). But in addition to being considered safer, using pasteurized milk to make cheese is also easier because its behavior is predictable. Large **cheesemakers** get their milk in tanker trucks, which have to be spotlessly clean and keep the milk at about 5.6°C. Small dairies may use milk from their own herds. Once the milk is collected, it is put into a huge container and warmed.

Milk is separated into curds and whey

First, the milk must separate into **curds** (solid) and **whey** (liquid). To start this process, the **lactose** - or milk sugar - needs to become lactic acid. After warming the milk, cheesemakers add a **starter culture** that contains one or more types of bacteria, including *Streptococcus thermophilus* and *Lactobacillus helveticus*. These bacteria are also known as lactic acid bacteria (**LAB**) because they produce lactic acid as they metabolize. The specific mix of bacteria depends on the type of cheese being produced.

Cheese curds

Once the acidity level in the milk rises, the **casein** (one of the proteins in milk; whey is the other) can **curdle**. This requires the addition of **rennet**, which is a group of enzymes extracted from the stomach lining of a young cow, sheep or goat. In the stomach, rennet allows the animal to digest its mother's milk. When added to milk, it makes the casein turn into curds.

After settling for up to two hours, the curdled milk has the appearance and texture of custard or pudding. The temperature of the cheese at this point depends on the type of cheese being made. Generally, higher temperatures produce firmer cheeses. Next, the curd is cut using a tool called a **harp**, which releases the whey. The size of the curds will determine the type of cheese - soft cheeses come from large curds, while harder ones come from very fine curd. The **whey is drained** and used as an additive in processed foods and in animal feed.

The next steps in the cheesemaking process depend on the type of cheese.

Pressing

If the cheesemaker is producing cheddar (or a similar uncooked, pressed cheese), for example, he or she might **cheddar** the curds. In this process, the curds are **stacked** on top of each other, **pressed** together and then stacked again to expel the maximum amount of whey and dry them out. Then they're **chopped fine**, salted and **pressed into molds**.

Cooked, pressed cheeses come from curds that have been cooked and **stirred** to give them a soft, texture. High temperatures result in firmer cheeses like Emmental, while low ones create the right texture for fontina. Mozzarella production ends after the cooking process. **Blue-veined cheeses** aren't cooked at all, because they need a looser texture for mold to grow.

Salt flavors the cheese and also keeps it from **spoiling** quickly. If the salt has not already been added to the curds, the cheese can be rubbed or washed with salt, or even **floated in a briny "bath."** All of these methods affect the flavor of the cheese in different ways - cheeses like Parmigiano-Reggiano get a **salt rub** while washed-rind cheeses are washed with brine or other liquids.

Next, the cheese is usually packed into a mold. Some are pressed to remove more whey, while others are simply molded. The more a cheese is pressed, the denser its texture will be. Some cheeses are finished after this stage, but many go through a **ripening** or aging period.

Before this stage, cheeses that need ripening usually taste bland and rubbery. During ripening, the milk proteins in the cheese break down further and impart more taste. The two most important factors during ripening are temperature and humidity, so cheese is usually ripened in carefully controlled storage facilities. Soft cheeses need high humidity, and they ripen quickly. Hard cheeses need slightly lower humidity. The humidity keeps the cheese from getting too dry and allows it to ripen at the right pace. Many cheeses are regularly washed, brushed and turned while ripening.

Affinage

"*Affinage*" is the French word for "maturing" or "the art of refining," especially when it comes to cheese. During ripening, the starters that were used to begin the curdling process play a part again and influence the taste and appearance of the final cheese. Cheeses with holes are made with bacteria that eat lactic acid and give off bubbles of carbon dioxide. Soft-ripened cheeses like Brie are made with bacteria that make them start ripening on the outside first. Mold is often sprayed on to the surface to encourage the growth of white, "**bloomy**" rinds.