

Cheese Varieties and their Production

by Amanda Newendorp

Background

With estimates of cheese's date of birth ranging from 8000 to 3000 years BC, historians believe that it was discovered by accident. They suggest that middle easterners, who often used the internal organs of animals for storage, found that milk curdled (formed solid chunks) when left in a dried animal stomach for several hours. Upon discovering this, they experimented with preserving the curds through salting and pressing. As cheese became known throughout the continent, production methods varied to develop new types of cheese. While the middle eastern cheeses were typically a soft and creamy Ricotta or crumbly Feta, Europeans typically pressed and aged their cheese in caves, eventually developing the Gouda, Brie, and cheddar we know today.

Cheese Production

Curdling

Today, the same principals are applied. Cheese producers start with cow, goat, or sheep milk. This milk first needs to be curdled (separated into liquid whey and solid curds) by converting lactose, or milk sugar, into lactic acid. This is done by adding either an acid such as vinegar, or more commonly, a starter culture. The starter culture contains one or more types of bacteria, known as lactic acid bacteria, which produce lactic acid as they metabolize. As the milk becomes more acidic, a protein called casein needs to curdle.

Traditionally, the rennet, an enzyme from the interior of a young cow, goat, or sheep's stomach aids this conversion, but a genetically engineered version of rennet is commonly used now. At this point, the curds are in the form of a rubbery gel (**Figure 2**), and for some varieties, such as cream cheese, little more modification is required. However, the cheese typically moves on for more processing (**Figure 1**).

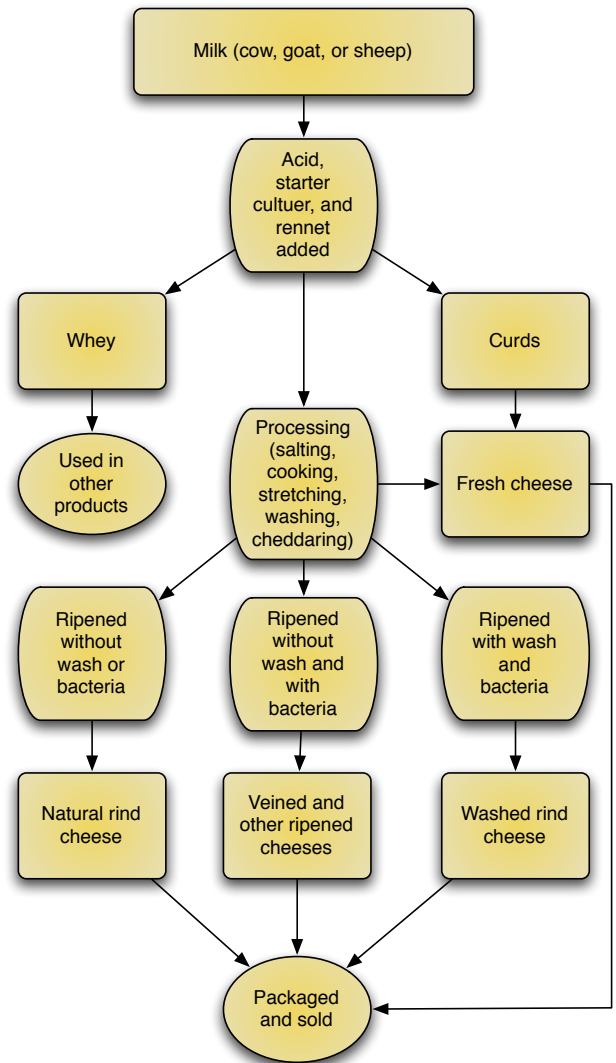


Figure 1: Cheese Production Process



Figure 2: Curds

Processing

During the first step of processing, the curd is cut into cubes (large cubes for soft cheese and small cubes for hard cheese), which allows more whey to drain out of the curds. The texture and flavor are now controlled by varying the processing technique:

Cooking: For some cheeses, the temperature is raised to 35-55° C (100-130° F). This creates a harder cheese by encouraging more whey to leave the curds. Taste is also affected, as the heat triggers chemical reactions.

Salting: Along with acting as a preservative, adding salt to the curds removes more of their whey, changes their flavor, and firms their consistency. Salt can be mixed directly into the curds or applied to the outside as a dry salt or as a brine (salt water) wash.

Cheddaring: To produce cheddar or similar cheeses, the curds are repeatedly stacked and pressed, forcing more whey from them to create a hard cheese.

Stretching: Stirring and kneading the curds in hot water to form a ball creates the stringy texture found in mozzarella and provolone cheese.

Lactose Intolerance

People suffering from lactose intolerance are sometimes able to eat cheese more readily than other dairy products. The low level of lactose in well-aged cheeses and the lack of cow milk in cheese made with goat or sheep milk allow more consumers to enjoy them without a negative reaction.



Figure 3: Cheese pressed in molds

Washing: Some cheese is washed in warm water; this causes a more mild flavor by lowering the cheese's acidity.

After this processing, cheesemakers press the cheese into molds (Figure 3), which allow liquid to escape as more whey is drained from the curds, where it takes its final shape. This cheese may be sold as it is, often lacking much more flavor than salt and having a rubbery texture, but it typically goes through an aging process next.

Ripening

In its final stage of production, cheese is set out in a controlled environment to age (Figure 4). Cheesemakers manage its temperature, humidity, and bacteria population. During the aging process, the starter bacteria again become active as they break the casein protein and milkfat into fatty acids, amines, and amino acids. It is during this process that Swiss cheese gains its signature holey appearance, as its bacteria produce carbon dioxide gas bubbles. Additional bacteria are often introduced (either applied directly to the cheese or made present in the air) to further manipulate the cheese's final taste and consistency. These bacteria work from the outside in, first forming a crust on the exterior before gradually affecting the interior of the cheese. Also, the cheesemaker sometimes creates holes in the cheese, allowing the entrance of oxygen and the simultaneous formation of mold throughout the cheese.



Figure 4: Aging cheese

Smoked Cheese

Instead of using salt to preserve their cheese, some cheesemakers choose to smoke their cheese. This process involves exposing the cheese for days or weeks to smoldering wood at anywhere from 20-85° C (70-190° F). It gives the rind an orange tint and the cheese a smokey flavor.

Types of Cheese

Fresh

Fresh cheeses never go through an aging process and are only good for a few weeks. Often still containing some whey, they typically are soft with a mild flavor and may be coated in leaves, ash, or herbs.

Examples: Feta, cottage, cream



Fresh Cheese: Feta

Natural Rind

Typically made with goat milk, natural rind cheeses can be described as chalky and moist when young. They develop a grayish-blue, wrinkled rind without any added bacteria.

Examples: Sancerre, Chabichou, Lancashire



Natural Rind Cheese: Lancashire

Soft Ripened

Soft ripened cheese retains some of its whey and can be recognized by their white "bloomy" rind. Having only slightly more flavor than fresh cheeses, they are buttery and almost runny in texture.

Examples: Camembert, Brie, Chèvre Log



Soft Ripened Cheese: Camembert

Semi-soft Ripened

Similar to soft ripened cheeses, these are rubbery and elastic with a gray or brown rind. They also have a more pronounced flavor than softer cheeses.

Examples: Edam, St. Nectaire, Pont L'Eveque



Semi-soft Ripened Cheese: Edam

Washed Rind

These semi-soft cheeses are aged in a brine, beer, or wine wash to maintain their internal moisture. The wash attracts bacteria that produce an orange rind and causes a strong taste and odor known to many "stinky cheeses."

Examples: Limburger, Muenster, Langres



Washed Rind Cheese: Muenster

Naming of Cheese

- Names of cheese are capitalized when they are named after a geographical place.
- Names of cheese are not capitalized when they contain nouns or adjectives that are not normally capitalized.
- What Americans know as Parmesan cheese is actually a version of Parmigiano-Reggiano, a cheese that can only be made in two Italian cities, Parma and Reggion. The Americanization of its name, Parmesan, is also capitalized by convention and can be made anywhere in the world.
- There is some variation in the use of accent marks. While European cheese names often contain an accent mark, many American producers ignore their presence.

Hard

Hard cheeses are dense and heavy, having been cheddared early in their production. They may have been washed in brine or have an oiled or waxed rind to prevent them from drying out.

Examples: Cheddar, Parmigiano-Reggiano, Gruyere



Hard Cheese:
Parmigiano-Reggiano

Processed

Including preservatives, emulsifying agents, food coloring, and other non-traditional ingredients, processed cheeses are inexpensive and easy to produce. They are the most-consumed type of cheese in the United States.

Examples: American, Velveeta, Cheez Whiz



Processed Cheese:
American

Veined

Commonly known as blue cheese, veined cheese is recognized by its lines of blue-green mold spread throughout its interior. Its texture can vary, but veined cheese tends to have a strong flavor.

Examples: Stilton, Gorgonzola, Maytag Blue



Veined Cheese:
Gorgonzola

Pasteurization/Health Concerns

While most modern cheeses are made with pasteurized milk, some traditional cheesemakers still use raw milk (milk that has not been pasteurized, or heated to kill any harmful bacteria or viruses). However, research and statistics show that cheese made with raw milk poses no significant health risk. Data does not show an increased risk of contamination in raw milk cheeses. They must be aged for at least sixty days to be sold in the United States; this time is believed to allow the cheese to dehydrate and become acidic enough that it is difficult for bacteria to multiply. Furthermore the natural bacteria found in cheese is believed to prevent harmful bacteria from taking over. Still wanting to produce a safe product, raw milk cheesemakers are very careful about the health of their animals and maintenance of their equipment and procedures.

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