

## II. DEFINITION AND CLASSIFICATION OF CHEESE

**Definition.** Cheese, a concentrated dairy food made from milk, is defined as the fresh or matured product obtained by draining the whey (the moisture or serum of the original milk) after coagulation of casein, milk's major protein. Casein is coagulated by acid produced by select microorganisms and/or by coagulating enzymes resulting in curd formation. Milk may also be acidified by adding food-grade acidulants in the manufacture of certain varieties of cheese, such as cottage cheese.

Almost all cheese manufactured in the United States is made from cow's milk (whole, reduced fat, nonfat, buttermilk, cream, whey, nonfat dry milk solids, or a combination of some or all of these products). However, other sources of milk (sheep, goat) can be used in cheese-making.

Cheese may be unripened (fresh) or ripened (matured). In unripened cheeses such as creamed cottage and cream cheeses, the curd, separated from the whey, can be used immediately. According to federal regulations, all unripened cheese moved in interstate commerce must be made from milk pasteurized at not less than 145°F for at least 30 minutes. In ripened cheeses such as Cheddar and Swiss, the curd is further treated by the action of beneficial select strains of bacteria, molds, yeasts, or combinations of any of these ripening agents, resulting in a cheese of a specific flavor, texture, and appearance. Ripened cheeses must be made from pasteurized milk or, if not, the cheese must be held for at least 60 days at a temperature of not less than 35°F. If cheese is not made from pasteurized milk the manufacturing date or the statement "held for more than 60 days" must be indicated on the label.

Cheese can be natural or blended. Natural cheese such as Cheddar is produced directly from milk. Pasteurized blended cheese, process cheese, cheese foods, cheese spreads, and cold-pack cheeses are made by blending one or more different kinds of natural cheese into a homogenous mass. Optional ingredients may be added.

**Federal Regulations.** Cheese marketed interstate or imported is required to comply with federal standards of identity. Federal standards of identity are provided for more than 90 different cheeses. These standards for cheese and cheese products define the food by specifying the following:

- The ingredients used (including the kind and quality of optional ingredients)
- The composition (the maximum moisture content and the minimum percentage of fat in the cheese solids or in the total mass of cheese)
- The requirements concerning pasteurization of the milk or an alternate minimum ripening period
- The production procedures
- Any special requirements unique to a variety of class of cheese

Federal standards of identity assure the consumer of consistent cheese characteristics and uniform minimum composition. Refer to the Code of Federal Regulations for regulations regarding specific cheeses. Recently, the standards of identity for lowfat and nonfat cottage cheeses were eliminated. These cheeses are now subject to the requirements of the FDA's "general standard," which permits foods to be named by use of a defined nutrient content claim (e.g., lowfat cottage cheese, 1% milk fat) and a standardized name (e.g., cottage cheese).

Imitation cheeses, natural and processed, are often derived from imitation milks or other nondairy components. In the U.S., cheeses made from cow's milk but not meeting U.S. federal standards of identity in terms of composition are also called imitation cheeses. The FDA defines an imitation food as one not meeting nutritional equivalency requirements for the natural, non-imitation product. An imitation cheese may be labeled alternate, substitute, or simulated instead of imitation. An alternate or substitute cheese resembles the traditional cheese and meets FDA's definition of nutritional equivalency comparisons. The FDA considers only the 20 nutrients for which U.S. Recommended Daily Allowances (U.S. RDA) have been established. The regulations stipulate that only the nutrients present in measurable amounts of 2% or more of the U.S. RDA in one serving of the traditional food must be present at least at the same level in the substitute.

The United Dairy Industry Association administers a program for identification of real dairy foods. The "REAL" seal on a carton or package identifies milk, cheese, and other qualified dairy foods made from U.S.-produced milk that meet

federal and/or state standards. This seal assures consumers that the food is not an imitation or substitute.

**Classification.** Several different formal schemes are used to classify cheeses. Cheeses may be grouped according to unique manufacturing or processing procedures, consistency or rheology (softness or hardness), country of origin, general appearance (size, shape, color), source of milk, and chemical analysis.

Cheeses may be categorized according to manufacturing procedures such as the method by which the curd is formed (by acid and/or coagulating enzyme) or the ripening agent (bacteria, mold, yeast, unripened) (Table 26). However, only a few cheeses (blue, Camembert, brick, Swiss) are characterized by distinctive ripening agents. Cheeses may also be classified according to rheology, or softness and hardness. Federal standards of identity for hard grating, hard, semisoft, and soft classes of cheese are indicated in Table 27. However, there are no objective measurements of the softness or hardness of cheese. Some cheeses such as brick, classified as semi-soft,

may actually be harder than rindless Swiss or washed-curd Cheddar, which are described as hard cheeses. Although formal cheese classifications provide useful information, universal standards of classification are needed.

## REFERENCES

- Kosikowski, F.V., and V.V. Mistry. *Cheese and Fermented Milk Foods. Volume 1: Origin and Principles*. 3rd ed. Westport, Conn.: F.V. Kosikowski, 1997.
- International Dairy Foods Association. *Cheese Facts 1998 Edition*. Washington, D.C.: National Cheese Institute. October 1998.
- U.S. Department of Health and Human Services, Food and Drug Administration. Code of Federal Regulations, Title 21, Part 33, Cheeses and Related Cheese Products. Washington, D.C.: U.S. Government Printing Office. April 1998, pp. 294-346.
- Food and Drug Administration. Lowfat and skim milk products, lowfat and nonfat yogurt products, lowfat cottage cheese: revocation of standards of identity; food labeling, nutrient content claims for fat, fatty acids, and cholesterol content of food. Final rule. Fed. Register 61(225): 58991 (Wed., Nov. 20), 1996.
- Chandan, R. *Dairy-Based Ingredients*. St. Paul, Minn.: Eagan Press, 1997.

**TABLE 27**

**Federal Standards for the Maximum Moisture and Minimum Milk Fat  
for Classes of Cheese Designated by Consistency**

| <b>Consistency</b> | <b>Moisture Maximum<br/>Percent</b> | <b>Milk Fat Minimum in Solids<br/>Percent</b> |
|--------------------|-------------------------------------|-----------------------------------------------|
| Hard grating       | 34                                  | 32                                            |
| Hard               | 39                                  | 50                                            |
| Semisoft           | 50                                  | 50                                            |
|                    | (more than 39%)                     |                                               |
| Semisoft part skim | 50                                  | 45                                            |
|                    |                                     | (less than 50%)                               |
| Soft               | Not specified                       | 50                                            |

United States Code of Federal Regulations, 1998.