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Last July, we paused to savor the robust characteristics of the grana cheeses found in the Po River Valley and Lombardy region of the Italian Alps. Since we were already climbing and headed north, I thought our next stop should be the valley, or tal in German, of the River Emme in the Canton of Bern in west-central Switzerland. This fertile, mountain valley dotted with traditional timber-built homes and dairies has been the home of the king of Swiss-type cheeses since the mid-15th century. Emmental cheese, also called Ementhal or Emmenthaler, embodies a slightly woody, close knit texture; sweet, hazelnut-like flavor; and distinct round/oval eye formation that would be recognized universally as Swiss cheese.

First You Begin With High Quality Milk

Emmental manufacture starts with high quality milk and ends with wheels of cheese weighing up to 100 kilograms (kg) (220 lb). Traditionally, 1,000 to 1,200 kg of milk is added to a copper kettle, which is preferred by some who argue that ionized copper from the kettle activates ripening enzymes. However, a great deal of Emmental cheese is made in stainless steel vessels. The starter culture is then added to the milk. Because Emmental curds and whey may be cooked to a temperature as high as 55°C (131°F), compared with 38°C (100°F) for Cheddar, a blend of thermophilic (heat loving) lactic bacteria is added. Streptococcus thermophilus and one of several lactobacilli such as Lactobacillus delbrueckii subspecies bulgaricus produce lactic acid during manufacture and pressing. The third component of the starter culture, Propionibacterium freudenreichii subspecies shermanii, becomes important later. Rennet is then added to coagulate the milk forming a firm continuous curd. A frame strung with stainless steel wires called a harp is then used to cut the curd into rice-sized curds, which are cooked in the whey. A large, coarse cheesecloth is used to scoop the curd and some of the whey out of the kettle and into a large round hoop. A series of pressing and turning steps molds the cheese to the shape of the hoop and allows for the remaining whey to drain. Between pressing steps, the coarse cheesecloth is replaced by a finer textured cloth to provide a smoother outside fin-
ish. After pressing overnight, the wheel of cheese is soaked in saturated salt brine for 2-3 days. The wheels are then dry salted and turned daily for 10-14 days at 10-15°C (50-59°F) to develop a rind on the outer surface. The turning process is not light work considering the 220-pound weight of some wheels. The hot room is the next and most characteristic step in the Emmental ripening process.

A Good Cheesemaker Knows Appropriate Eye Size

During 3-6 weeks of maturing in the 20-22°C (68-72°F) hot room, the propionibacterium will be busy producing propionic acid and CO2 from the lactate produced by the lactic acid bacteria. Propionic acid contributes to the characteristic sweet, nutty flavor while CO2 is responsible for forming the round/oval, shiny holes known as eyes. A good cheese maker will know when the eyes have reached the optimum size of ½ to 1 inch (1-3 cm) by listening for the appropriate drum-like resonance of the wheel when tapped with the handle of a cheese sampling implement known as a trier. The rate of CO2 production dictates the number and size of eyes in the cheese. Assuming a good close-knit texture that will capture and hold the gas, very rapid production of CO2 due to over-setting with propionibacterium will result in too many eyes giving the cheese a lace-like appearance. Some manufacturers of non-traditional Swiss cheese actually over-set intentionally. However, under-setting will result in too few or no eyes, giving rise to a condition known as “blind” Swiss.

After appropriate eye formation, the wheels are moved to a 7°C finishing room to stop eye growth and allow further development of flavor and body characteristics. This stage of the maturation process is also where the quality and preparation of the milk will have the greatest effects. Poor quality milk will result in off-flavors from unwanted enzyme activity and milk contaminated with Clostridium tyrobutyricum may develop large, cavernous openings and cabbage-like structures along with off-flavors. Today many manufacturers of Swiss (Emmental) cheese around the world make rindless blocks of Swiss for the masses. Utilizing modern equipment and appropriate polymer packaging, they can produce Swiss cheese without a rind, thus limiting product loss due to trimming of rind.

Other Swiss Cheese

Switzerland is also the home of several other cheeses known as the mountain cheeses. Alpkäse and Bergkäse are manufactured from the milk of cows grazing in high, mountain pastures. Although related to Emmental, they are traditionally characterized by smaller, variable sized wheels due to the slowly decreasing quantity of milk produced by the cattle as they graze their way down the mountainside through the early spring, summer and early fall. In Appenzell in eastern Switzerland, a unique variant known as Appenzeller is soaked in cider or spiced wine during the early stages of maturation imparting a distinctly fruity flavor. Raclette is a traditional mountain cheese that is best served by cutting the wheel in half and exposing the cut surface to a source of heat. The melted cheese may then be scraped from the surface and enjoyed with one’s favorite accompaniments such as bread, fruits, or pickles.

With a turn to the west and our sight set on the cheese rich landscape of France, let’s make one more stop in the Jura mountains on the Swiss-French border to sample another traditional Swiss cheese known as Gruyere. Many of us will recognize Gruyere as the name of a cheese that appears in institutional lunches as small wedges in a foil wrapper. However, a closer look at the label will reveal that the package contains processed Gruyere rather than the native cheese, and although tasty and nutritious, this product is not generally a good representation of the parent cheese. Gruyere generally is made in smaller, 55 kg (121 lb) wheels but shares the characteristic slightly woody body and close knit texture of Emmental. The greatest difference results from the addition of a diverse bacterial smear growing on the surface of the cheese during ripening. The enzymes from the surface smear increase the pungency of the flavor profile, which is tempered during processed cheese manufacture by removing the rind and using immature cheese.

Alas, the time has come to leave Switzerland, but with my ham and Emmental on rye safely tucked away for the journey, I look forward to hiking eastward into France on the next installment.

Related Readings and References