



Fall 2011/Winter 2012

## The Specificity of Comté Milk

What gives Comté its flavors and aromas? While certain factors have been much talked about such as the season in which the cheese is produced, the diet of the cows, the particular skills of the cheesemaker and the duration of the affinage, much less is known about what might be the most important factor responsible for Comté's specific range of flavors—something much less tangible and obvious. Here's a hint: it's microscopic, starts with the environment and is transferred by the milk.



Comté is made with the raw milk of Montbéliarde or Simmental breed cows in the Jura Mountain region of France following specific, traditional production methods delineated in Comté's PDO (EU Protected Designation of Origin) legal requirements. There are 160 *fruitières*, or cheesemaking chalets located throughout the region, each of which collects milk from farms within a 16-mile diameter maximum. Even though the production methods are seemingly the same in every *fruitière*, Comté has a wide range of flavors and aromas that varies from one *fruitière* to another. In the 1990's, the Comité Interprofessionnel du Comté (CIGC) began a program to study the link between area of production and taste to see if there was a pattern among the flavor profiles of different *fruitières*.

In 1996, a study done in collaboration with the University of Besançon was released showing that different *fruitières* do indeed produce cheese with distinctly different aromatic profiles according to where they're located. Comté wheels produced in the same region share certain flavors and aromas while wheels produced in different regions have markedly different flavor profiles.

"What was interesting," states Jean-Jacques Bret, Director of the CIGC, "was that there was one

*fruitière* in a specific region that had a totally different profile from the surrounding *fruitières*, even though it shared the same elevation, etc. We could not understand it. We finally had a geologist study the maps, and he discovered that the area where this *fruitière* was located had a totally different type of soil than the others—it was made up of moraine deposits versus the limestone elsewhere. That's what accounted for the difference in the aromatic profile of the cheese."

It became clear that *terroir*—or the type of soil, vegetation and climate in a given region—had a direct impact on the flavor of Comté. But how? In the early 2000's, the CIGC turned its attention to researching the specific characteristics of the *terroir* that influence taste. They discovered that the link between flavor and *terroir* is far too small for the eye to see. A population of microscopic bacteria referred to as microflora enter the milk as soon as it leaves the cow. "Milk inside the cow is sterile," explains Bret. "Microflora thus enter the milk from the external environment—the soil, the plants, the stables, the feed, the milking equipment, etc." Florence Bérodiier of the CTFC (Centre Technique des Fromages Comtois) notes, "The cow picks up the microflora from the soil in particular, but also from the grasses and plants." Other factors are the hay the cows eat, the milking equipment and the general ecosystem of the milking parlor/stable.

Research conducted by the INRA (French National Institute for Agricultural Research) has shown that if all of the microflora in raw milk is removed via micro-filtration, the experimental cheeses made in the style of Comté have lost all of their taste and are only lactic/butter tasting. The same research shows that two mini-cheeses made with their respective original microflora taste different from one another even when all the other technological and ripening parameters are identical in everyway. Thus, the microflora have proven to be directly related to the specific tastes and qualities of Comté.

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### Comté ("con - TAY") cheese ID

#### General information:

**Origin:** Jura Mountains (Massif du Jura), France

**Milk Type:** Raw cow's milk

**Cheese Style:** Artisanal, pressed, cooked, with natural brushed rind.

**French AOC (Appellation d'Origine Contrôlée) since 1958 and European Union Protected Designation of Origin (PDO) Certification.**

- Delimited area of production: Doubs, Jura, Ain, elevation 1500-4500 ft.
- Milk must be produced by local cows of the Montbéliarde (95%) and Simmental (5%) breeds. There are approximately 112,000 Comté cows.
- Minimum of 2.5 acres of natural pasture for each animal.
- Cattle feed must be natural and free of fermented products and GMOs.
- Each *fruitière* must collect milk from dairy farms within a 17-mile diameter maximum.
- Milk must be made into cheese within 24 hours maximum of the earliest milking.
- Only natural starters must be used to transform the milk into curds.
- Wheels must be aged on spruce boards. Minimum aging is 4 months, generally 6-18 months and sometimes even longer.



## Comté Cheese Association

will be at the next

Winter Fancy Food Show in San Francisco,  
January 15-17, 2012 Booth #3122

# Interview with a Comté Dairy Producer



Jean-François (a.k.a “Tas”) Marmier grew up in a family of Comté dairy farmers. After a few years spent exploring the world as a young man, Tas planted his roots back in the Haut-Doubs, and today, he and his brother run their three-generation family farm in Bouverans. As he explains, his job is to be a farmer-producer of Comté, not a farmer-producer of milk.

## Did you always want to be a dairy farmer?

After I received my diploma in agriculture in 1990, I didn't know if I wanted to become a farmer or something else. I was eager for new experiences and joined the National Service in the SAS for a year, then spent two years Down Under in Tasmania (hence the nickname!), where I worked for a year on a dairy farm and for a year doing various jobs: a chauffeur, landscaper, tutor, grape picker, waiter...

## How did you end up back in the Jura?

I moved back to the Jura and worked for four years in various cheese-related activities, such as in assisting a Comté cheesemaker, working as a saleur brushing Comté wheels in the aging caves, helping make Mont-d'Or for a season, studying the milk quota system as a scholarship trainee in the UK... In 1997, I began a cheesemaking course in a big industry in order to become an international cheesemaker, after which I decided instead to become a local producer of Comté.

## How big is your farm?

We have 250 acres of pasture with 50 cows, all Montbéliarde cows for the making of Comté. I am a farmer-producer of Comté, not a farmer-producer of milk.

## So, all of your milk is used for the production of Comté?

Yep. Each of our cows produces about 6,000 liters of milk each year, and our total annual milk production is 290,000 liters, which is the maximum amount we're allowed to produce each year under our milk quota. If I'm doing my math correctly, this translates into about 725 wheels of Comté a year. We're not focused on a high yield; our focus is on a high-quality, high-protein milk.

## When is the milk transformed into cheese?

Every morning and evening we drive our fresh milk—in a tank hooked to our old Peugeot 205—to our fruitière [cheesemaking chalet], which is in the center of the village [Bouverans], and it must be transformed into Comté within 24 hours. There are 6 farms that belong to our fruitière of Bouverans. We [the farmer-producers] work collectively and together employ the cheesemaker, who is assisted by his wife. They live above the fruitière.

## Thus, your coop of farmers owns the cheesemaking facility?

Exactly. We're actually involved in the entire process. The wheels age for 2 weeks (pre-affinage) at the fruitière before they're shipped to the affinage cellar [aging cellar]. Every month we visit the affineur to taste the previous 6-months of our Comté to review quality.

## How many Comté wheels does your fruitière produce each year?

Our fruitière currently produces 5,700 wheels of Comté per year. This is the maximum number of wheels we can produce per our quota (in other words, this is the number of plaques vertes, or green Comté seals, that we can purchase annually from the CIGC). This number is determined by the total yield of milk the fruitière receives annually, which for us is about 1,900,000 liters, as well as the amount of pastureland corresponding to the fruitière. The fruitière produces 15-20 wheels a day.

## What is the structure for payment between the dairy farmers, cheesemaker and affineur?

We sell our wheels to the Union Coopérative Agricole des Fruitières Traditionnelles (UCAFT), which handles the sale to the affineur. We [the dairy farmers in our coop] get paid collectively from UCAFT according to the quantity of cheese sold. With that money, we pay the cheesemaker, who has a fixed salary, and pay the expenses linked to the cheese dairy. We then divide the remaining balance between investments in the fruitière and the dairy producers. Each producer is paid according to the amount of milk he provides and the quality of milk in terms of protein and fat contents—a higher protein content results in a higher yield of cheese—and sanitary conditions.

## How do you control milk quality?

Milk quality starts in the pasture, so we practice extensive agriculture, which preserves the diversity of flowers, soils and grasses in our paddocks. We milk our cows twice a day, and we store the milk at 16°C, which preserves the natural microflora in the milk. Random samplings of our milk are also taken several times a month to test for negative bacteria.

## Apart from farming and Comté, do you have any other passions?

I'm addicted to my motorcycle! If I have free time, you can find me exploring the roads of the Jura on the back of my bike. I also like to cook, and I have to admit that I prefer cooking to fixing things around the farm. Shhh!

Since Comté is pressed and aged (for a minimum of 4 months, and often as long as 12-18 months or even longer), its aromatic development is the result of a long process, as opposed to fresh cheeses where the paste is not pressed and cooked. In such cheeses, the specific aromas of the plants that the cows grazed upon can be present in the cheese, whereas for Comté the aromas are more heavily influenced by the microflora and the many biochemical reactions they induce in the cheese.

The exact source of the microflora is far from being totally understood, however. “We understand that the microflora are the result—and the expression—of the diversity in the local conditions including soil, climate, and terroir, but the mechanisms are not understood,” explains Bret. “Studies are now underway that will help us better understand the transmission mechanisms in the future.”

Comté cows each have at least 2.5 acres of pastureland to graze, and the milk for Comté is not pasteurized. Both of these measures support the natural microflora population in the milk (pasteurization kills most of the microflora). The natural starters (lactic flora responsible for acidification and proteolysis) used in the cheesemaking process are also carefully prepared by the cheesemaker using whey from the previous day to amplify the milk's native microflora and not overwhelm/eradicate them. Bérodiér notes, “Scientific studies have shown that after 2-3 weeks, the original microflora in Comté milk have multiplied faster and have taken over the added bacteria population from the lactic starter. Conversely, the starter culture population greatly declines following the molding of the new cheese. The microflora in the raw milk are thus extremely important!” Similarly, experiments are now being carried out with regards to the preparation of the rennet. The rennet is traditionally macerated in whey before it's used, and studies are underway to learn how this practice impacts the cheese, its microflora, its aromas, etc.

Based on this work about the microflora in Comté milk, the CTFC is now actively communicating to Comté farmers the importance of handling the cows and their milk in such a way as to foster its rich microflora, and there are already several regulations in place for Comté. For instance, the Comté dairy farms and fruitières are not allowed to use any disinfectants in their facilities, as this kills the microflora (they are allowed to use other specific cleaners). Comté milk also must be transformed into cheese within 24 hours because after that the milk quality starts to decline. The longer milk is held, the greater the risk of certain microorganisms taking over others, and the balance of minerals and the structure of proteins can also change. Finally, the temperature that the milk is stored at is also regulated. Currently, milk is held at 4°C, but studies have shown that this temperature can disrupt the balance of microflora. Thus, by the end of 2012, all Comté producers must hold their milk at 10-18°C.

As Bérodiér concludes, “At the end of the day, to be a good Comté milk producer, it's a state of mind where you have to pay tremendous attention to the milk.” Thus, the goal of the Comté dairy farmer is to produce a *lait vivant*: a “living” milk abundant with quality microflora. And later, the cheesemaker too must share this same state of mind, respectful of the microflora that are vital to the flavor in the finished cheese.

When Comté was first made over a thousand years ago, the producers were unknowingly instilling a tradition in the region that would preserve a unique taste of place for centuries to come. Thanks to the microscopic mechanisms of milk, Comté today remains a living product that connects tasters to the Jura pastures and to a long history.—





## Poached Eggs with Sunchokes and Comté Polenta

From *Food & Wine*, September 2011



*Food & Wine* magazine featured this mouthwatering recipe in its September issue as an adaptation of Chef David Bouley's eggs en cocotte with Comté foam, served at his flagship Bouley restaurant in New York City.

- 1/2 pound sunchokes—scrubbed but not peeled, very thinly sliced
- 3 tablespoons unsalted butter
- Salt and freshly ground pepper
- 1 cup whole milk
- 1/2 cup instant polenta
- 1 1/2 cups shredded Comté cheese (6 ounces), plus more for garnish
- 4 large eggs
- Chervil sprigs and truffle salt, for garnish

1. In a medium, deep skillet with a tight-fitting lid, combine the sunchokes with 1 tablespoon of the butter and stir over moderately high heat until the butter is melted. Add 1/2 cup of water, season with salt and pepper and bring to a boil. Cover and cook over moderate heat until the liquid is evaporated and the sunchokes are tender and lightly browned, 8 to 10 minutes. Transfer the sunchokes to a bowl and wipe out the skillet. Fill the skillet with water and bring to a simmer.
2. In a large saucepan, combine the milk with 1 cup of water, season with salt and bring to a boil. Whisk in the polenta and cook over moderate heat, whisking, until tender, about 5 minutes. Stir in the 1 1/2 cups of shredded cheese and the remaining 2 tablespoons of butter until creamy; stir in a few tablespoons of water if the polenta is too stiff.
3. Crack the eggs into ramekins and gently pour them into the simmering water in the skillet, one at a time. Poach the eggs until the whites are set and the yolks are runny, about 4 minutes. Using a slotted spoon, transfer the eggs to a paper towel-lined plate.
4. Spoon the polenta and sunchokes into shallow bowls and top with the eggs. Garnish with chervil and cheese, sprinkle with truffle salt and serve right away.

**Bon appétit!**

# A Region of Salt

Salt is integral in the cheesemaking process: it acts as a preservative and helps with the draining of the curds and the formation of the rind. The wheels of Comté are rubbed with coarse salt and morge (a combination of salt, water and bacteria from older rinds) as soon as they are unmolded and during the entire duration of their aging, first at the fruitière—pré-affinage—and then in the aging cellars (caves d'affinage), until they leave for the market. (Even so, Comté is actually a cheese with very little salt, containing only 300 mg of sodium per 100 g of cheese—interestingly, the perception of saltiness in Comté comes in part from its large quantities of amino acids, which emphasize salty and umami flavors).

### Salt Contents in Cheeses

Sodium, in mg per 100 g (100 g=3.52 oz)
Camembert - 802
Cantal - 940
Cheddar - 619
Gorgonzola - 1,232
Gouda - 816
Gruyere - 334
Mozzarella - 415
Parmesan - 1,598
Roquefort (brebis) - 1,600

Sources: <http://www.alsosalt.com>, CNIEL

In a surprising instance of “what grows together goes together,” for centuries the salt that was used in Comté production was actually harvested right in the Franche-Comté region. Salins-les-Bains is probably the most emblematic site, but many villages in the region include “salt” in their names: Lons-le-Saunier, La Muye, etc.

210 million years ago, the region was covered by a shallow sea, which left behind a thick layer of “rock salt” below the earth’s surface. When underground water comes in contact with the rock salt, it absorbs the salt and creates a “brine.” At the saltworks of Salins-les-Bains, this brine was converted into salt for nearly 1,200 years. The brine was pumped 250 feet from its source (first by hand, then using hydraulic piston pumps) and boiled in a process called “fire-source” production, evaporating the water and leaving the salt behind. The salt, or “white gold” as it was known since it was so valuable, was essential for food preservation.

For centuries (beginning in the Middle Ages when Comté was first produced) Comté makers used local salt to age their cheese. However, in the 1960’s and ’70’s, the Jura saltworks ceased their production due to increasingly high costs, aging equipment, and a decreased need for salt in food conservation. At that time, Comté producers experimented with different quality salts, including Alsatian pretzel rock salt. But this salt would slip between the fingers of the *saleurs* and dissolve poorly in brine, resulting in the formation of poor rinds on the Comté wheels. Unacceptable!

Eventually, Mediterranean sea salt from the Salins-du-Midi company in the Camargues was found to share the same characteristics as the local salt, and it was soon adopted. Today, Comté *affineurs*, or cellarmasters, continue to use this salt during the aging process.

As to the saltworks of Salins-les-Bains, it has become a UNESCO World Heritage Site and has been converted into a museum for the public. Its sister site in Arc-et-Senans offers a small number of comfortable hotel rooms for visitors to the region.

# The CIGC Part 1: the organization

*What is the CIGC and what do they do? In this series, we'll introduce you to the organization and the people behind it!*

The Comité Interprofessionnel du Comté (CIGC) was established in 1963 as a public organization to represent all of those involved in the making and selling of Comté. Comté is considered part of the French patrimony (like the Arc de Triomphe or Eiffel Tower) but instead of the state controlling the regulations and administration of Comté, the choice was made to establish an organization that is run by the professionals who are involved in the making of the cheese, under the supervision of the French government.



There are 4 groups within the CIGC, each made of up 4 members who are professionals in the

field. The groups each represent a different part of the cheesemaking process: producers (dairy farmers), *fruitières* (cheesemakers), *affineurs* (cellar masters) and members of commerce (sellers such as

retailers, distributors and supermarkets). The members of the groups are elected by their peers every 3 years. For a decision to be made, it must be approved by *all* four groups.

There are also a number of separate work groups and commissions made up of CIGC members and outside experts to manage various initiatives such as publicity, research, quality control and technical information. In addition, there are 15 people who work in the CIGC office headquarters, located in Poligny (in the same building as the Maison du Comté, a public museum devoted to the making of Comté). The CIGC employees are responsible for the day-to-day operations of the organization, including research and technical issues, quality control and monitoring, economics, information and communications, and marketing and promotion of the Comté appellation.

The collective aspect of the CIGC is the hallmark of Comté and the region. Everything is debated and challenged before decisions are made. This isn't always easy, but it means that every new measure is carefully reviewed by all of the actors involved and is supported with solidarity by all once approved.



## Tasty Cooking with Comté!

The newest series of Comté Recipe cards is now available! Sharing the theme, **Wholesome Harvest**, the new cards include: **Comté & Tomato Gratin**; **Stuffed Peppers with Comté & Couscous**; and **Vegetable Potage with Comté Crisps**. These vegetarian dishes are brimming with both flavor and nutrition. Download the recipes at [www.comte-usa.com](http://www.comte-usa.com) or email us at [trade@comte-usa.com](mailto:trade@comte-usa.com) to request packs of the 4x6-inch cards for your displays, demos and promotions! Convenient recipe card holders are also available upon request.

### Comté & Tomato Gratin

In this recipe, an herbed Comté and breadcrumb topping provides a crisp, cheesy counterpoint to juicy, sweet tomatoes. The result is as beautiful as it is delicious! Serve the gratin as a side dish with fish or grilled meat, or on its own with some crusty bread for mopping up those mouthwatering juices.

Serves: 4-6

Olive oil for dish

4 ounces Comté, shredded (2 scant cups shredded)

½ cup fresh breadcrumbs (preferably from a day-old baguette)

1 tablespoon minced fresh parsley

1 teaspoon minced fresh thyme

1 small garlic clove, minced

Salt and freshly ground black pepper

2 pounds tomatoes, cored and sliced 1/4-inch thick

1. Preheat the oven to 500°F. Coat a 9x13-inch baking dish lightly with olive oil.
2. In a small bowl, toss together the Comté, breadcrumbs, parsley, thyme, garlic and a pinch of salt and pepper.
3. Layer the tomato slices in the baking dish, overlapping them slightly. Season with salt and pepper. Sprinkle the Comté topping evenly over the tomatoes.
4. Bake 10 minutes, or until the topping is light golden. Serve warm or at room temperature.

Bon appétit!

### The Comté Cheese Association

provides you with everything you need for a successful selling program, including: recipe booklets, brochures, aprons, demo toothpicks, training tools and more. Visit [www.comte-usa.com](http://www.comte-usa.com) for POS materials and free downloads.

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