Theme 8: Traditional food technology

Report of France

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French cheeses made from ewes' milk

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General de Gaulle was said to have remarked « How can you govern a country which has more than three hundred different cheeses?"

In fact, it seems that there are more than five hundred, especially as new cheeses are constantly being invented. Around 45% are cow's milk cheeses, 40% goat's milk and 10% ewe's milk, with 5% from mixed milk types.

Four main families of cheeses can be distinguished:

- Fresh cheeses, which can be recognized by white colour and high water content
- Soft cheeses whose curd is put in one piece in the mould. Draining water takes place slowly. They have a surface mould due to being covered by fungi (for example camembert), or have a washed rind (for example maroilles). There are also cheeses with veins of blue-coloured mould (for example Roquefort).
- Uncooked compressed cheeses include products with "high rennet" whose curd is cut and mixed in a vat.
- Cooked pressed cheeses use the same technique as uncooked pressed cheeses, i.e. draining as much water from the milk as possible. This aspect is reinforced by cooking the grains of curd in a vat at more than 50°C, obtained after coagulation and mixing.

Ewe's milk cheeses include all families of cheese except cooked pressed cheeses. Some cheeses, though not many, mix ewe's milk and cow's or goat's milk. We will examine essentially cheeses with ancient credentials and not new cheeses which are regularly invented by factories and which do not really innovate in cheese-making techniques and which are mainly made for marketing purposes. Even more so than for sheep-meat production, the geography of ewe's milk cheese production is concentrated in the south of France with the Midi-Pyrénées region and its famous Roquefort cheese but also Corsica whose livestock farming is principally of sheep and to a lesser extent the Poitou-Charentes region and the Languedoc Roussillon. Cheeses are then mentioned according to their cheese-making technique and finally the specific cheeses of the Aquitaine region which will be our regional focus.

2. Geographical position of cheeses

2.1. Corsica

The milk producing and cheese-making history of Corsica is mainly connected to the mountainous nature of the island. Farming of sheep and goats, of local and robust breeds, is generally a good way to use this type of difficult environment. Cheese making is originally for food as can be found in other Mediterranean regions. Milk production (approximately 17 million litres of milk) comes exclusively from ewes (91 000 females in 1994) according to the agricultural statistics department) and goats (38 000 females according to the same source) from 800 to 900 farms, since there is practically no cow's milk production on the island. The farming systems are extensive based upon double transhumance, from the mountain to the plain in winter l'impiaghjera, and from the coastal plains to the mountainous areas in summer l'amuntagnera, with more or less long stages in between, where the villages can be

found. Milk produced by these local breeds has a high fat and protein content including milk produced by goats. This explains why transformation technologies are similar or even identical. Milk harvest lasts approximately two hundred days per year, but quantities of milk available for cheese production are greater in Spring, when the casgiu veraninchu is produced and in summer pastures in the mountain where the cheese produced, the casgiu muntanacciu, is ripened by the farmer. In general, at the start of summer, all animals are dry. Traditional cheese-making is exclusively carried out on farms i.e. done by farmers who transform the milk from only their own flocks. Globally, one can situate pressed cheeses in the south and far south of the island, whereas soft cheeses are rather made in the centre and south centre.

From the end of the XIXth century until 1996, Corsican ewes' milk also was supplied to the Roquefort industrial units.

The traditional denominations which remain in the collective memory and in common usage, refer to geographic names which are in the main, those of the principal traditional areas of transhumance to the mountains and which indirectly confirm the importance of production in summer pastures. For hard cheeses, the traditional name was cuscio and indeed, the pianu di Cuscione is a high-altitude plateau where, as shown by migration route maps, all farmers who spent winter in the coastal plains in the south of Corsica, used to meet. Similarly, for soft cheeses, whereas the venacu cheese is the most-often cited, even the most well-known, it is also the product of an area of rich high-altitude pastures at the foot of the monte Cardo, not far from the monte Rotondu, which, across the mountains, is in the confines of a high valley which gives its name to another famous cheese, the niolu (**Fig. 1**), set between punta Artica and the monte Cintu. The summits are the boundaries of a vast area of transhumance in the central north-east. In fact, the Niolu shepherds had the particularity of not systematically spending winter on the territories of their own communities, but also towards other coastal areas.

In these soft cheeses, two denominations are important. One, the bastelicacciu, is produced in the plain during winter by shepherds coming from the pieve of Sampieru, where another great plateau of transhumance is situated in the centre-south, the Ese plateau. The other one, calinzana, is the only cheese made by cheese ripeners. Traditionally, they purchased the production of shepherds migrating from the Niolu, until they left for summer pastures and they were for a long time the only ones to export Corsican cheese to the continent.

Over the last twenty years, many new products have blossomed, soft and hard cheeses, with trademarks which recall or use geographical denominations, more often than not in the Corsican language as if to give a traditional farm character to the product, whereas the technology is industrial. This said, these manufactured products which are often of good quality, take two-thirds of the island's ewe's milk production and a small part of the goat's milk production. They therefore represent an economic factor whose main outlets are the tourist market in summer and export to the continent. Only one product is common to all of these sectors, whether sheep or goat, farmhouse or milk, transforming into soft or hard cheeses, that is the brocciu. It is a whey protein cheese which was granted a regional denomination on 10th June 1983. It is the only Corsican product which has a certification and is also the emblematic product of the milk and cheese sectors.

2.2. The Midi-Pyrénées region

Midi-Pyrénées is a region with diverse landscapes, with many mountains and plateau, immense grasslands which are well suited to livestock farming. There are however two cheese production zones between the north and south of the region. In the South, in the Pyrenees, we can find a technique generalized throughout the mountain range, the purpose

being to store raw material, the milk, whether cow's milk, ewe's milk or a mixture. The products are varied and they have different names, tome du Couserans, Bethmale (**Fig. 2**), bamalou, rogallais, etc., but they all use the same basic technique, which consists of heating the non acid milk in the presence of rennet and to compress it to make it into a cheese weighing a few kilos.
In the North, in the Massif Central, cattle (Aubrac) and sheep live together. It is the pays de Causse, with limestone hills where the natural holes are used, the fleurines or galeries, to finish the cheeses. This region is the birthplace of Roquefort, a blue-venied ewe's milk soft cheese but also a cheese of the same family, the bleu des Causses, which is made of cow's milk. The same is true of the pérail ewe's milk cheese, (sometimes made of cow's milk), a young soft cheese which draws its name from the Occitan language. One can also cite the caillade, a coagulated chocolate-flavoured milk, or a twice cooked ewe's milk cheese (brousse), produced in the same way as ricotta, and also the ossau-iraty whose production zone extends beyond the Midi-Pyrénées region.

2.3. The Poitou-Charentes region

In the Poitou-Charentes, the strong organization of milk and cheese producing cooperatives is more than one hundred years old. The school in Surgères, founded in 1906 by Pierre Dornic, develops the enhancing of cow's milk through butter and cheese but also casein, which promotes the reputation of the region. The cheese-making tradition based on goat's milk (Deux-Sèvres) and also ewe's milk should not be forgotten. In the Charente, it is ewe's milk which is used in the production of the caillebotte, a cheese recorded by Quénot in 1818 (which elsewhere can be made with cow's milk), and also the Ruffec cheese, recorded in the 1830s by Guillaumin and Briand-de-Verzé. Moreover, though recently created (the trademarks were only registered in 1989 and 1990) the Pigouille (**Fig. 3**) and the Tri-cornes revive the ancient tradition of regional ewe's milk cheeses. But whereas the Pigouille takes its name from one of the basic accessories of the inhabitants of the poitevin marshes, the Tri-cornes evokes by its shape an ancient cheese which was made not far from the marshes. In 1867, Favre defined the trebesche as a cheese of triangular shape in the area of Fontenay. We do not know if it was made from ewe's milk. It was however obviously the case for the fromage d'ouaille from Oléron, in the shape of a triangular prism.

2.4. The Languedoc-Roussillon region

The Languedoc-Roussillon has seen the development of a cheese-making tradition linked to a strong pastoral tradition, cattle (cheeses from laguiole in the Aubrac, tome in the Lozère, blue cheeses), sheep's milk (pérail) and goat's milk (pélardon), in many regions which are difficult to access coastal plains and mountainous areas. Thus, beyond administrative boundaries, each terroir contributes its specific production:
In the Pyrénées-Orientales and the Aude, farm production of the Pyrénées-Orientales and the Aude which dates back to the Middle Ages, represents 12 tonnes of ewe's milk tome, 10 tonnes of goat's milk tome (fresh curd in a vessel) and 5 tonnes of cow's milk tome. The cheese-maker farmers are established in the mountain scrubland, in the high mountain valleys and high-altitude plateaux, often isolated and inhospitable.
The pyrénées type cheese, pressed and uncooked, can be stored for a time and comes from a mixture of cow's and sheep's milk.

2.5. The other regions

Of relatively little importance, three regions also produce ewe's milk cheese : the Centre region , le Limousin and the Rhône-Alpes region. These cheeses are generally more recently created.
In the Centre, the Brebis de Perusson in the Indre-et-Loire departement, and the Brebis du Lochois (**fig. 4**) in the Touraine, and the Brossauthym (**fig. 5**) in the Loire valley, near Loche are soft cheeses.
In the Limousin, the brebis de Saint-Hilaire-Foissac, and the Tome de Brach or Caillada de Vouillois originate in the Corrèze.
In the Rhône-Alpes, we can observe the Tomette de brebis des Alpes (**fig. 6**) and Le Bersend , the name of a small village in the commune of Beaufort (Savoie). Both are pressed uncooked cheeses.

3. Cheese-making techniques

3.1. Fresh Cheeses

Cheese-making begins with the preparation of the milk, the two main stages in the making of a cheese are then coagulation and draining. Cheese preparation includes a thermal treatment phase. Coagulation may occur by acidification (lactic acid coagulation) or by adding coagulating enzymes (rennet coagulation) or by both (mixed coagulation). Draining is the stage of separating the curd (solid phase) and the whey (liquid phase made up of water and soluble matters which are lactose, mineral salts and soluble proteins). Fresh cheeses therefore have an acidic whey, with little rennet and a high water content, the draining of which is achieved by filtration. This is a general technical overview, and each cheese has a specific recipe.

Fresh cheeses are made up of pure ewe's milk and a mixture of goat's milk or cow's milk.

3.1.1. In the Poitou-Charentes

In the Poitou-Charentes, in the Deux-Sèvres, the Tri-cornes (formerly trois-cornes, or sableau) (**Fig. 7**), used to be made with goat's or cow's milk, or even a mixture. Today, it is a raw ewe's milk fresh cheese with a trademark registered in 1989. The Tri-cornes has a triangular shape of 10cm per side and 3cm thick. This white-coloured cheese is very fragile as it is little drained. Its smooth and homogenous texture and is easily cut. Its percentage of fatty substances on dry matter is approximately 65% and it weighs approximately 150g. It can be eaten fresh with salt, with a salad accompaniment or with sugar as a desert.

3.1.2. In the Provence-Alpes-Cote-d'Azur region

In the Provence-Alpes-Cote-d'Azur region, the brousse du Var (**Fig. 8**) or brousse de Toulon is a very small production with merino and Lacaune breed sheep's milk. Contrary to what its name indicates, it is not a "brousse" cheese but a sweet curd cheese, neither wiped nor salted, presented in vessels of 5cm diameter 2.5 cm high and weighing approximately 60g.
Traditionally, shepherds milked the common or merino ewes from Easter (when the lambs had been weaned) and for two months.
Eaten fresh with sugar and jam, or salted, this cheese is used tomake omelettes or yogurt cakes (instead of the yogurt). The "brousse" is also used as a base for the broussin (cheese

preparation), due to later fermentation. It was often a way of using up unsold brousse cheeses or if they had been badly made.

3.1.3. In Corsica

A mixture of goat's and ewe's milk, the brocciu (**fig. 9**) is the iconic Corsican cheese. It is a whey-based cheese, in the shape of a log, weighing when put into moulds, between 0.5 and 1.5 kg. In its fresh state, it does not have a rid, and it is white coloured of soft and creamy texture. It has at least 40% fatty matter and its dry extract must not be less than 20%. It is eaten throughout the island not only fresh but also in many dishes (pasta, cakes, etc.). Rarely eaten abroad, it is discovered locally by continentals who often praise it, such as Ardouin-Dumazet in 1911. Then in the 1930s, Curnonsky and Croze, in their Trésor gastronomique de France, (France's gastronomic treasures) mention in several places the broccíu (in Ajaccio, in Calacuccia) and attribute to it various provenances: brocciu from Bocognano, from the Fiumorbo, from the Nebio, from the Niolo as well as its various stages of consumption, fresh brocciu partly ripened and dry. It is eaten in two formats: as it comes, fresh or ripened, as cheese or in preparations and traditional island culinary or cake specialties.
As it comes, it may be ripened after its surface is covered with salt. For cooking or cake-making, it can be used fresh, or salted or dry. In the latter case, it must be left to shed its salt for a certain time before being used, it is used in typical Corsical cooking specialities : in omelettes with wild mint, stuffed artichokes, courgettes or tomatoes, in cakes (imbrucciata, fritella, fiadone...).

3.1.4. In the Poitou-Charentes region

In the Poitou-Charentes region, the fresh caillebotte (**fig. 10**) and its spin-off the jonchée come from cow's or ewe's milk.
The caillebotte or caillebot is more often than not made in the home, which may nonetheless be found once a year in May, in Châteaubernard during the caillebotte festival. The caillebotte is a cow's milk curd with no defined shape and off-white colour. It is slightly creamy and very fragile.
Rabelais, who came from Chinon, quotes this cheese in his Tiers Livre, in 1546. Its spin-off, the jonchée is a curd presented on a bed of reeds. The jonchée was already appreciated at the end of the Middle Ages. Under the name of giuncata, it was a classical Italian dish and it can be found served in great banquets which were held around 1455 in the court of Charles VII.
Caillebotte and jonchée could be distinguished any more by their ingredients, which depended on the resources of the country : cow's milk, ewe's milk or goat's milk (jonchée from Aunis and from Niort). Contrary to the caillebotte from Angers or the Poitou, which used animal whey, that of the Charente was made using extract of thistles.

3.2. Soft cheeses

Coagulation of the curd can take place by the effect of acidification (lactic) but more generally through the addition of coagulating enzymes (rennet). After the curd has been drained, salting can be effected inside the cheese (salting of the particles of the curd) on the surface (dry salting). Salting completes the draining process and contributes to the formation of the rind, it acts directly or through the activity of the water from the cheese upon the development of microorganisms and enzyme activity during the ripening process, it brings its

characteristic taste and possesses the property of masking or exhaling the flavours of certain substances made during the ripening process which is more or less long.

The cheese may be rindless since it is covered with a leaf (Tomme d'Arles – **Fig. 11**), with a natural rind (Bastellicaccia, Pigouille), with a floral rind through being covered by mould (Pérail); they will be with a washed rind, covered by a smear, a slimey film at the surface of the rind (Calinzana, Niolu, Venacu). The technology of veined cheeses is similar to that of soft cheeses and the blue-coloured moulds are due to Penicillium roquefortii (Roquefort).
Ewe's milk can be used on its own.

3.2.1. In Corsica

In Corsica, the Bastellicaccia (**fig. 12**) is a cheese produced in winter in the plains, it has a denomination which refers to its origin ; the canton of Bastelica, a former pieve of Sampieru in the south of the island where the farmer-cheese-producers come from. In the shape of an irregular and crushed cylinder, the cheese is ivory white and of creamy texture.
Formerly in Bastelica, sheep rearing was characterized by double transhumance. Coming down in winter to the plains, the farmers made there a soft cheese then climbed back up to spend spring and summer in the mountains, where they produced a pressed cheese which was stored for later use. Nowadays, soft cheeses are still produced in larger quantities in the plains, which leads some people to call them bastelicaccia whereas less and less cheese is produced in summer pastures.

3.2.2. In the Midi-Pyrénées

In the Midi-Pyrénées, in the south of the Aveyron, the pérail (**Fig. 13**) or peralha, peralh in Occitan, is a ewe's milk cheese from Lacaune, with soft centre and floral rind, produced with a curd "rennet" industrially and "lactic" in farms. At 10-15 days' ripening, and it looks like a cake with rounded edges and creamy yellow rind. It contains 45 to 50% fat content on dry matter.
Little information is available about the pérail, eaten by its makers and sold on local markets in very small quantities.

3.2.3. In the Midi-Pyrénées : the case of the Roquefort cheese

The famous Roquefort (**Fig. 14**) is a soft blue-veined cheese in the Aveyron and the defined area in the adjacent departments (Aude, Gard, Hérault, Lozère and Tarn). More than 20 000 tonnes per year are produced. Roquefort is ripened exclusively in the ripening caves of the Combalou (Causse).
It is a cylindrical shaped cheese of 19 to 20 cms diameter, 8 to 10 cms high and weighing 2.5 to 3 kgs. Its rind is white, slightly shiny, its centre has blue veins, smooth and consistent. It has a slightly mouldy smell. Its aroma is delicate and pronounced, and it contains at least 52% fat content on dry matter.
The history of roquefort is given rise to many legends. Some authors would like to make believe it comes from Antiquity, but in 1411, Charles VII by letters patent, prohibited seizing cheeses in the Roquefort caves. Thus, these documents show that from the beginning the producers brought their cheeses and deposited them in the caves for them to be salted and ripened for a price. The commercial function grew in importance and the cave owners started to sell the ripened cheeses on behalf of the producers, then later to purchase from the farms fresh cheeses which they ripened and sold. This organization demonstrates how important the trade in Roquefort was. And it is in this fashion that the name of Roquefort

took on early notoriety which it was very soon necessary to protect. Throughout the XVIIth and XVIIIth centuries, Roquefort continued to enjoy a great reputation with Parisian tables and in the XIXth century, trade and food guides wrote a lot about this cheese. The second half of the XIXth century saw the great ripening firms asserting their commercial power, and the adoption of important innovations and in particular that of the spreading of the production area. Indeed, demand was constantly on the increase and the supply of white cheeses ripened in the caves spreads (firstly in the Causses to the surrounding regions, then at the end of the century to the Pyrenees and finally in the beginning of the XXth century to Corsica). Roquefort is the first cheese to be protected by the law on origin denominations, in 1925.
A cheese for the cheeseboard, it can also be used in many recipes: canapés, salads, soufflés, puffs).

3.2.4. In the Poitou-Charentes

In the Poitou-Charentes, the pigouille is a soft cheese with a natural rind. It is only made by one producer in Villers-Couture (Deux-Sèvres). It has been made from ewe's milk since 1990 whereas previously it was produced by a creamery from cow's milk.
The pigouille is a cylindrical shaped cheese of 10cm diameter and 3 cm high weighing approximately 200g with 65% fat content on dry matter. Of a white colour when fresh or partially fresh, the pigouille acquires blue patches during ripening. Its smooth texture is easily cut when in a fresh state, dry and easily broken after long ripening. Its centre is firm, homogenous and with a whitish rind.

3.2.5. In Mediterranean regions

In the Provence-Alpes-Côte-d'Azur, in the region of Avignon (Vaucluse) and of Nîmes (Gard), la tomme d'Arles is square shaped each side being 5 to 6 cm long and 1.5 cm high weighing approximately 80 g ; this rindless cheese is covered by a laurel leaf. The Tableau du maximum, established in 1793 for Uzès in the Gard, records amongst the regulated products a salted cheese coming from Arles and sold under the name of petit fromage or "fourmette". Local tradition recommended storing these cheeses in jute sacks. As and when needed, they were humidified, salted, peppered then put in a terrine dish (caieto), alternating layers of cheese and laurel leaves. After adding a glass of liqueur, the dish was covered with a cloth; the cheeses ripened at cool temperature in three weeks.

In the Languedoc-Roussillon, the pérail, soft centred cheese with floral rind is produced in the Causses of the Hérault, of the Gard and of the Lozère and the Aveyron. It is made from Lacaune ewe's milk, rennet and ferments and salt. The pérail has the shape of a flat disc measuring 80 to 90 cm in diameter and of 18mm high, it weighs 90 to 110g. Its fine rind is floral of yellow cream to off-white colour and its centre is homogenous, ivory white, fine and melting. The Pérail has 45 to 50% fat matter to dry content.

3.2.6. Goat and/or ewe milk's cheeses in Corsica

Some Corsican cheeses are made from goat's or ewe's milk and have a soft centre with a washed rind. The calinzana (**Fig. 15**) or calenzana has the name of the commune it comes from. It is a cheese which is collected fresh, from certain farmer-producers migrating in the traditional winter areas of the Niolo, then ripened in the village of Calenzana. It has a square shape with slightly rounded corners, flat and weighs between 300 and 400g. It does not

have a rind as such, and its centre is whitish, compact but supple with a characteristically piquant taste.
At the beginning of the XXth century, in Calenzana, the finishers sold a lot of the cheeses they had collected fresh but this tradition is disappearing, and nowadays, the number of cheeses ripened in Calenzana is greatly reduced compared to last century.
Eaten after ten to twelve months ripening, the "vecchju" is also eaten "fresh" primaticciu after four or five months.

The niolu or fromage de Niolo : casgiu niulinthu » bears the name of the high valley in the centre of the island a former pieve of the Niolu where it comes from. The niolu has a square shape of 12 to 14 cm each side with rounded corners and weighs 500 to 700g. Its centre, off-white colour, is firm, creamy with no holes and must be ripened throughout its thickness. Its rind, more grey coloured, is thin. As for its taste, it is sweet, piquant or strong according to its length of ripening. Its fatty matter on dry content varies between 45 to 55%.
In 1757, the author of the Essays on l'Isle et le Royaume de la Corse observes that in the Niolu and the Venacais, one found "many sheep and an infinite number of goats". Their milk had an enormous value.
A few years later, Guillaumin classified cheeses made in the Niolu as among the best Corsican cheeses.
It is eaten ripened, fattu (six to eight weeks) or vecchju (three to four months or more).

The venacu (**Fig. 16**) or fromage de Venaco or venaco, casgiu venachese is a soft cheese with a washed rind which bears the name of a canton in the centre of the island, former pieve of the Vecchju where is originates from. It is a slightly flattened cylindrical cheese with a convex heel and a diameter of 10 to 12 cm and 3 to 5 cm high, weighing between 400 and 500g. Its washed rind is orange red colour; the morge (smear) which gives the cheese its characteristic look is responsible for much of its taste and aroma. Its soft, creamy and homogenous centre, is ivory coloured. Its fat matter on dry content varies between 45 and 55%. In 1531, Agostino Giustiniani, bishop of the Nebbio, mentions it in his Description de la Corse.
Even if fresh cheese (24 to 48 hours) can sometimes be used in some food or cake recipes, the venacu is a cheese which is generally eaten after two to three months' ripening. When very old, more than six months' ripening, it was used grated as a seasoning for pasta, soups or stews.

3.3. Uncooked pressed cheeses

Uncooked pressed cheeses include products « mainly with rennet » and whose curd is cut and mixed in a vat. The mass is then put in a mould and highly compressed, without cooking.

3.3.1. In Corsica

In Corsica, the cuscio or fromage du Cuscione is mainly made in the south of Corsica, from ewe's and/or goat's milk. The cheese is cylindrical straight or slightly concave, 15 to 20 cm in diameter and 8 to 10 cm high, with a weight varying between 1.5 and 2.5 kg. Its centre, white to pale yellow, is protected by a thick rind, is of compact and crumbly texture when cut after ripening. Its fatty matter varies between 45 and 50%.
The cuscíone or coscione comes from Italy and is based on a type of production which dates back to Roman Antiquity.

Guillaumin mentions the coscione in a list of the best Corsican cheeses dated 1839.
Used fresh in cooking recipes, it is generally eaten at the end of meals. It is a cheese which may be stored and which is the link between one area of the countryside to another.

3.3.2. In the Midi-Pyrénées region

In the Midi-Pyrénées region, in the Hautes-Pyrénées, la tome de brebis or barousse or fromage de Barousse (**Fig. 17**), is a cheese of mixed milks, ewe's and cow's, the latter having become the more common.
The cheese has the shape of a small wheel 20 cm in diameter and 6 cm high, weighing 2 to 2.5 kg. Its rind is natural and its centre soft with a few openings. Whitish in winter, it goes yellow when grazing starts. Its fat content is 45 to 50% of dry matter.
Dralet, an author in 1813 of a Description des Pyrénées, notes that the mountain people do not make butter and that the milk is made into cheese. The village of Sost, nowadays in the heart of the production area of the tome de barousse, was during the XIXth century and also much of the XXth century one of the obligatory passages for flocks of ewes going to summer pastures. Situated at over 700 metres altitude, it was a staging post for the flocks which were on their way up to 1 700 or 1 800 m searching for grazing land. From the beginning of the XXth century, the development of cattle farming, which occupied pastures in mid-altitude mountains as is the region of Sost, has lead to the progressive abandoning of high mountain pastures reserved for flocks of sheep.
The tome is eaten at the end of a meal. Furthermore, the feast in honour of the Virgin of the church of Gourdan-Polignan (Haute-Garonne) is held on 8th September or the nearest weekend, included a fair of Barousse cheeses with a competition. This was abandoned several years ago.

3.3.3. In the Provence-Alpes-Cote-d'Azur region

In the Provence-Alpes-Cote-d'Azur region, the champoléon (**Fig. 18**) comes from the Drac valley in the Champsaur, from the communes of Champoléon and Orcières (Hautes-Alpes). Depending on the season, the cheese is made from cow's milk, cow's and goat's milk or cow's, goat's and ewe's milk, depending on the animals present and the amount of available milk. It is a cylindrical wheel 20 cm in diameter, at least 10 cm thick and weighs 1 to 2 kg. Its rind is thick and reddish orange coloured. Its centre has a blue vein in the middle. In the autumn, due to the lack of milk, the cheeses is produced every other day; they curd of the day is added to yesterday's after covering it with ashes.
The champoléon, surnommé le fromage aux trois laits, (three milk cheese) follows the lineage of cheeses produced from several types of milk, but the references to this type of cheese can hardly be found before the XXth century.

4. Focus : The Aquitaine region

In the Aquitaine, a major animal farming region, the three milk producing animals are present: cows, ewes and goats. In the Pyrenean mountain range, ewes are the main source of cheese production.
The basco-béarnaise, whose name indicates its origins, the manech à tête noire and manech à tête rousse are the regional breeds. The manech noire is more a mountain breed whilst the manech rousse is more resistant to heat of the lower lands. This region is therefore very

marked by the importance of milk-producing ewes, which account for one half of the type of products and which give a volume of milk close to 30 million litres, in third place equal with the Languedoc and behind Midi-Pyrénées. In total, the Aquitaine produces some 3 500 t of ewe's milk cheese.
The Basque country keeps up the production of ewe's milk curd (some types of which have become brands) which a short time ago, were made from milk (or from whey) heated by stones from the fire. Traces of this can still be found with the Spanish neighbours.
In the mountains, pure ewe's milk is king, or mixed cheese (cow's and ewe's milk) with variations from valley to valley. Another particularity, the fromage fumé de Bardos, produced on the Landes border of the Pyrénées-Atlantiques, which is thought to be a throwback to ancient practices of smoking which protected from insects.
The industrial Bongrain plant is important in the region.

4.1. The ewe's milk curd or « mamia » (registered trademark)

"Mamia" **(Fig. 19)** is a fresh cheese or from whey, also called greuil, breuil, gaztembeda, zembera. It is produced in the Béarn, French Basque country and in the Gironde. It is a seasonal product; it can mainly be found in summer. The curd is made from raw whole milk from ewes of local breeds whereas the breuil and the greuil come from whey. Its general texture is firm and the grain fine. It contains 50% fat content on dry matter. The Mamia is sold in glazed earthernware pots.
In the Béarn, the fresh curd, obtained directly from milk with added rennet, was formerly offered for sale in a package made of woven reeds, hence its name jonchée or Juncade, which was consumed from the end of the XVIIth century in snacks given to the Bishop of Lescar in the Béarn piedmont. The greuil, a by-product of the cheese, owes its name to it original consistency, grulh means small lump. It is in fact made up of the residue of the curd which has been removed to form the cheese after heating of the remaining whey. In 1933, the gruhl and the jonchée were classified by Curnonsky and Croze amongst the gastronomical specialities of the Basses-Pyrénées, notably in Saint-Jean-de-Luz.
The curd is eaten fresh or with sugar, jam, fresh fruit, herbs, honey or even salted. In summer, the shepherds eat it with strong coffee and sugared Armagnac. Tradition has it that production begins on the first Sunday of Easter. The dried zembera (former version) is salted and peppered; the dried greuil was crumbled into onion soup.

4.2. Ossau-iraty

This is a pressed uncooked cheese also called Petit Ossau-Iraty brebis-Pyrénées (**Fig. 20**). This cheese which has a registered designation of origin (AOC) includes cheeses of different names: iraty, arnéga, ardí-gasna (Basque country), esbareich, oloron, laruns (Béarn). This name lives alongside other cheeses still produced in the Béarn and Basque mountains from ewe's milk, which are called "mountain ewe's milk cheese" or "ewe's milk cheese from the Pyrenees." Finally, a mixed cheese, i.e. from ewe's milk and cow's milk is also produced traditionally.
The production is carried out by some 60 farm producers and 7 industrial creameries which represent more than 90% of volume. In 1995, 2 000 tonnes were produced in AOC which equates to 30% of all traditional ewe's milk cheeses. The area recognized in 1980 covers the Pyrénées-Atlantiques and three communes of the Hautes-Pyrenées.
Pyrenean ewe's milk cheese production is approximately 4 000 t and involves many breeders and workshops. As for the mixed farm cheese, it is made by a few dozen breeders spread in the main through the Aspe valley, accounting for 150 to 200 tonnes per annum.

The cheese has a flat cylindrical shape straight or slightly convex, 26 cm in diameter and 12 to 14 cm high. It weighs between 4 and 5 kg, farm cheeses can be as much as 7kg. The small format weighs 2 to 3 kg. It is produced from whole ewe's milk from the manech tête noire or tête rousse and basco-béarnaise breeds. Its centre is ivory coloured and its rind, dried and rubbed, goes from orange yellow to ash grey. It contains at least 50% fat content on dry matter.
The ewe's milk cheese of the Pyrenees obtained from milk of the same breeds is more variable in shape and not predefined. The mixed farm cheese from the Pyrenees contains one third ewe's milk two thirds béarnaise breed cow's milk and weighs around 5 kg.

The crisis which affected Roquefort from 1974, provoking a very important restriction in collection of ewe's milk in the Pyrenees by industrialists from the aveyronnais, explains the creation of the Ossau-Iraty AOC. In March 1980, the ewe's milk cheese, coming from a dual Basque and Béarn tradition, was recognized by decree which relaunched its production. It was given the name of two sites on the far limits of the basco-béarnaise production area: the Ossau valley to the east and the Iraty mountains in the west. What was formerly merely called "country cheese" (ardí-gasna in basque) or "ewe's milk cheese" thus acquired an official existence.
The historian J. Dumoteil found in the beginning of the XVth century, in a notary's office in Oloron, many purchase agreements for cheese made between suppliers and traders of that town. It is stipulated that they must be "good, dry and saleable, broken and wormy excluded". One finds them again at the end of the XVIIIth century in the Tableaux du maximum (1793) which distinguished for the Basses-Pyrénées, the "new" or the "fresh" and the "old" ewe's milk cheeses on the markets of Pau, Nay, Oloron or Mauléon-Licharre, the old being in all cases the most expensive. It was only after 1918 that the ewe's milk cheeses of the Pyrenean valleys started being appreciated outside of this territory. Curnonsky and Croze record, in 1933, the «fromage d'Ossau » as well as that of Tardets and of Bielle near Laruns, where a large cheese fair was held in September. But it is the AOC which contributed to standardise this production by enabling it to conquer new markets and a widespread recognition whilst leaving room for independent farm or creamery production.
Today, France remains the country of cheese. Cheese creation remains lively, but controversies regularly affect cheese heritage in France. One of the recurrent themes is health regulations which oppose in particular detractors of raw milk cheese and those of pasteurized milk. Originally, all cheeses were made from raw milk. Since cheese making was carried out close to milk production facilities, the milk was of good quality and good healthy cheeses could easily be made. Raw milk cheeses are made exclusively with milk heated to the maximum temperature required to make whey, in practice between 15°C and 40°C. Raw milk cheese has a rich and typical taste.
In order to satisfy the increase in cheese consumption and to reduce production costs, cheese is frequently made in larger and larger industrial units, using milk from different origins. The milk must therefore be transported, often over long distances. In the same vein, to reduce transport costs, large creameries only collect milk from farms every 3 or 4 days. In fact, during transport and storage, milk bacteria, good or bad, multiply in too large quantities; contamination may occur. The quality of milk becomes unfit for cheese production. This entails the need to pasteurize the milk by heating it to 72°C for 20 to 3 seconds to destroy the germs. Cheeses thus made have a taste which goes from neutral to sweet and not typical.
Regulations provide that certain AOC cheeses may only be produced using raw milk, close to where it is produced. Thus, Roquefort cheese has the oldest AOC, as the decree dates back to 1925. In the years 2000, European regulations also provided that when cheeses are sold on markets, producers must be equipped with refrigerated display cabinets. If it is true that

this regulation improves the sanitary qualities of cheeses, one has witnessed the disappearance of all of the small producers of local cheeses who did not have the means to invest in this kind of equipment.

CONCLUSION

Finally, a controversy opposed France and the United States in 1999. The Confédération paysanne, headed by José Bové, protested against the decision of the World Trade Organisation to authorize American sanctions (in particular taxation of Roquefort) due to the refusal of the European Union to import beef with growth hormones from the United States. To fight symbolically against this decision, José Bové and the militant farmers destroyed the McDonald's in Millau, in full view of the media. In January 2009, The George W. Bush administration threatened to tax Roquefort at 300%. The dispute was finally resolved in May 2009 under the new Barack Obama administration by an agreement which stipulated that the United States renounce customs duty on Roquefort in exchange for access to a market for beef raised without recourse to hormones.

Bibliography

L'Inventaire du Patrimoine Culinaire de la France [par région] : Produits du Terroir et recettes traditionnelles, Albin Michel, Conseil National des Arts Culinaires. Alsace (418 p., 1999), Aquitaine (386 p., 1997), Bourgogne (118 p., 1993), Champagne-Ardenne (258 p., 2000), Corse (338 p., 1996), Ile-de-France (338 p., 1993), Languedoc-Roussillon (408 p., 1998), Limousin (224 p., 1998), Lorraine (312 p., 1998), Midi-Pyrénées (338 p., 1996), Normandie (400 p., 2003), Picardie (226 p., 1999), Provence-Alpes-Côte-d'Azur (498 p., 1995), Rhône-Alpes (578 p., 1995).

Website of the Institut National de l'Origine et de la Qualité (INAO) : http://www.inao.gouv.fr

Website of the cheese producer Androuet (Paris) : http://androuet.com/

Website of the Institut National de Recherche Agronomique (INRA), production of cheese : http://www.inra.fr/la_science_et_vous/apprendre_experimenter/aliments_fermentes/le_fromage

Photographs

Fig. 1 :
Niolu cheese
Corsica island

Fig. 2 :
Bethmale cheese
Midi-Pyrénées region

Fig. 3 :

Pigouille cheese

Poitou-Charentes region

Fig. 4 :

Brebis du Lochois cheese

Centre région

Fig. 5 :
Brussauthym cheese
Centre region

Fig. 6 :

Tomette de brebis des Alpes cheese

Rhônes-Alpes region

Fig. 7 :
Tri-cornes cheese
Poitou-Charentes region

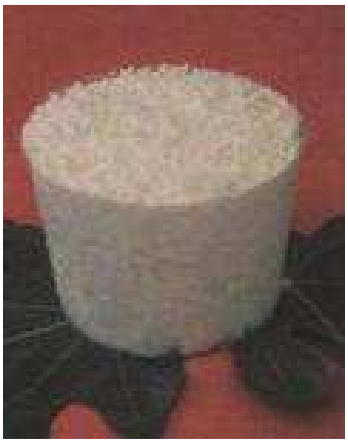

Fig. 8 :

Brousse du Var cheese

Provence Alpes Côte d'Azur region

Fig. 9 :

Brocciu cheese

Corse island

Fig. 10 :
Caillebotte cheese
Poitou Charentes region

Fig. 11 :
Tome d'Arles cheese
Provence-Alpes Côte d'Azur region

Fig. 12 :
Bastellicaccia cheese
Corsica island

Fig. 13 :
Perail cheese

Midi-Pyrénées region

Fig. 14 :
Roquefort cheese
Midi-Pyrénées region

Fig. 15 :
Calinzana cheese
Corsica island

Fig. 16
Venacu cheese
Corsica island

Fig. 17
Barousse cheese
Midi-Pyrénées region

Fig. 18
Champoléon cheese
Provence-Alpes-Cote-d'Azur region

Fig. 19 :
Mamia cheese
Midi-Pyrénées region

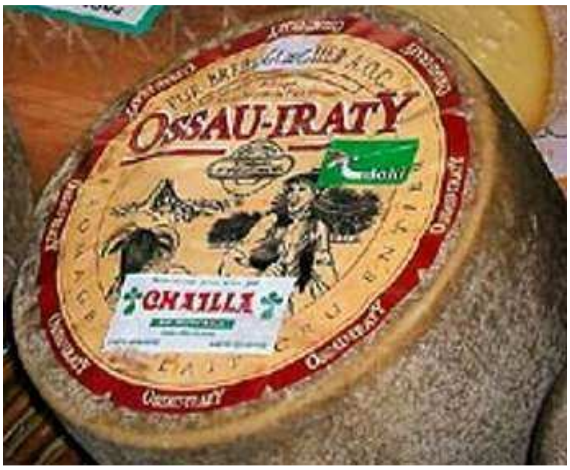

Fig. 20 :
Ossau-Iraty cheese
Midi-Pyrénées