WP5 – Case Study
The Roquefort cheese supply chain

0. General information.

- Name of OLP : Roquefort
- Type of product : blue cheese
- Type of denomination : labelled with PDO since 1996, obtained a legal protection as far back 1925 ("Appellation d'Origine").
- Country of origin : France – Region Midi-Pyrénées
- Area of production : the revision of the area of production is actually in progress. This area will correspond with the south part of the Aveyron and all the bordering "départements" (south of Massif Central region).

Like all the famous cheeses in France, the history of the Roquefort cheese begins with a legend. This legend says that a young shepherd forgot his meal (bread and white cheese) in a cave. On his return, he noticed that the mouldy bread had contaminated the cheese. The Roquefort cheese would be born that way. The existence of the cheese is very ancient, archaeological researches managed to highlight a millennial cheese tradition (about 3 500 B.C.).

The Roquefort cheese is a cheese exclusively made in the natural caves of Roquefort-sur-Soulzon (Aveyron). Those caves are characterised by a constant temperature and humidity all along the year. The cheese benefits from a legal protection since the 1925 law, which forbids anyone to call Roquefort cheeses who do not respect this specific code of practice.

The region of production is essentially rural. Agriculture and agrofood activities represent an important sector of the economy (about 15 to 20 % of employment, and in 2000, 95 % of the agricultural incomes proceed from rearing). Raising ewes is the main agricultural activity.

1. Definitions, characteristic and legal protection.

1.1. Characteristics of the OLP and its production system.

The Roquefort cheese supply chain is based on specific resources, and notably on a production system with particular characteristics. This production system was built during the 19^{th} and the 20^{th} century (construction of dairies in all the villages of the region, development of a collecting network, researches on the refrigeration of the cheeses…).

The actors of the emergent supply chain contributed to the birth of a real "Roquefort cheese model" facing towards intensification and increase of the productivity, in a context of scarcity of ewe's milk in the region. This model is characterised by specific elements :

- mechanisation of milking
- enlargement of farm buildings
- ewe's feeding
- increase of milk production as a result of genetic researches (Lacaune breed)
- specialisation of farms
- artificial insemination

The increase of milk production in the region was very important between 1960 and 1980 (50 millions of litters in 1960, 70 millions in 1975, 90 millions in 1980, 130 millions in 1990), and since 1970-75, the overproduction has become structural. The market of Roquefort cheese could not absorb the milk production, which contributed to the first measures of diversification in 1972-73. The "Roquefort cheese model", alone, chose then to move towards production control and quality improvement.

This production system contributed to the emergence of a specific and precocious cheese know-how very well known all over the world. It also contributed to the production of a specific blue cheese, different from the other blue cheeses. Since the 90's, the Roquefort cheese has been relatively homogenous, in spite of the heterogeneity of the firms involved in the supply chain (SME and industrial groups).

1.2. The process of institutionalisation.

The recognition of the Roquefort cheese is very old. A judgement from the Parliament of Toulouse affirmed its specificity as early as 1666 (in the Old Regime). Around 1920, the legal protection of the product resulted from local actor's will to "stabilise" the market. At the time, the production of the Roquefort cheese suffered from imitations and frauds, which were prejudicial to its reputation (use of different kinds of milk, production of cheeses called "Roquefort" out of the region…).

The industrials actors of the Roquefort cheese supply chain wanted to have the exclusive right of the denomination and to build a kind of "monopoly". The milk producers wanted a well defined area of production in order to "prevent" the industrials from being supplied out of the region (some industrials wanted to build dairies in other countries).

Thus, the Law of 1925 is the expression of a compromise between all those aims. At this time, there were numerous conflicts between industrials and milk producers, but the necessity of a co-operation prevailed.

1.3. Code of practice.

The Roquefort cheese is a blue cheese produced exclusively with ewe's raw milk, inoculated with blue spores of "Penicillium Roqueforti". The milk must proceed from ewes that belong to the "Lacaune" breed only. The feeding must be based on grazingland, fodder, and cereals coming at least for 75 % from the region of production.

The production of the cheese requires several stages defined very precisely in the code of practice : introduction of rennet, inoculation with "Penicillium Roqueforti", cutting curd, draining, dry salting and needling. The cheese is ripened during a minimal period of 90 days. This ripening is done for a part in caves located under the village of Roquefort-sur-Soulzon and delimited by the judgement of the tribunal of the city of Millau (12th July of 1961). The caves are naturally run through by fresh and humid draught proceeding from calcareous break called "fleurines".

1.4. Certification.

The respect of the code of practice is guaranteed by a complex system of controls which concerns all the stages of production of the Roquefort cheese. At the moment, in connection with the INAO (National Institute of Designation of Origin), the actors of the supply chain are developing a specific system of auto-control destined to formalise the most important elements of the code of practice and to verify their good application.

The certification procedure concerns essentially the quality of milk. The actors of the supply chain have progressively built a "grid" with specific, precise and strict criteria. This grid governs for a part the price of the milk. For the ewe's milk, the main criteria of quality is fat rate. Sanctions are imposed to the producers in case of an important presence of pathogenic bacteria.

Finally, the milk producers who use ensilage must take in charge the specific costs of the controls induced by this practice.

1.5. Legislative aspect – description of.

The law that institutes PDO and PGI is the Reg. (CE) nº2081/92. The Reg. (CE) n°1107/96 confers PDO mark to the Roquefort cheese. In fact, the legal protection dates back from the law of 26th July of 1925 (the only one product protected by a law). Today, the Roquefort cheese is regulated by the decree of 22nd January of 2001, which abrogates the precedent decree (29th of December 1986). In France, all the products benefiting from an AOC depend on the INAO since 1990.

All the Roquefort cheeses must be distinguished by the INAO label. Moreover, this logo must be accompanied by the collective brand of the interprofessional organisation called

"Confédération de Roquefort", and symbolised by a red ewe. Those inscriptions are very often combined with trademarks, such as "Roquefort Société" (the most famous one) and "Roquefort Papillon" for example.

During all its history, the Roquefort cheese had to struggle against local, national and international imitations because of its notoriety. A lot of cheeses were produced so as to look like the Roquefort cheese, with vague names such as "type Roquefort" and "genre Roquefort". As far as in the 60's, numerous producers of the South of France were illegally calling "Roquefort" cheeses made with cow milk.

The "variable geometry" of the area of production is very interesting to analyse. In the 20's, this area extended to Corsica and Pyrenees because needs in milk were important. But in the 70's, with the technical progress and the increase of productivity, The industries gradually abandoned these two regions and recentred themselves to the south of Aveyron.

2. <u>Link with production and marketing system.</u>

2.1. Production chain aspect.

The supply chain is organised around two types of actors : milk producers and industries. There is no farm cheese producers since a long time ago (about 1920). Farms deliver their raw material to collectors who carry it in big dairies belonging to industries and located in the region of production. Milk is then routed towards the Roquefort-sur-Soulzon caves in order to be matured. Therefore, only industries deal with the cheeses processing and marketing.

The relations between these two types of actors are very closed. Indeed, the chain is characterised by specific rules established by actors. Every year, ewe's milk producers and dairy processors negotiate the milk price within the chain. This latter depends on quality and on the market. For a few years, this price is more than 1 € per litre, that is very high. The annual production of Roquefort cheese is about 18 000 tonnes. This is the third most important AOC cheese after the Comté cheese (about 40 000 tonnes) and the Cantal cheese (about 18 500). In 2000, 170 millions of litres of milk have been collected, but only 90 millions are assigned to the production of the Roquefort cheese (see table below).

Years	Tonnage (t.)
1991	19 869
1992	19 493
1993	19 048
1994	18 179
1995	19 363
1996	17 738
1997	17 885
1998	17 716
1999	17 581
2000	18 135

Source : Confederation of Roquefort

For a few years, the Roquefort cheese market had been stabilised. It is a very narrow market but a guaranteed one, which is a constant characteristic of the old PDO cheeses. Actually, the Roquefort cheese is the main production of all the firms involved in the supply chain, even if some of them equally sell other products.

Today, seven firms produce and sale Roquefort cheeses. The industrial concentration has been very important : 18 firms in 1970, only 12 in 1975. The first firm represents alone about 70 % of the production ("Roquefort Société", born in 1842). The remaining 30 % are produced by the six others : 3 small and medium-sized firms (of whom one co-operative firm) and 3 family firms. Let us notice that the market shares of the second firm – "Roquefort Papillon" – increase regularly for a few years, and represents today about 12 % of the total production.

Since 1992, Roquefort Société belongs to the Lactalis group, which is the most important industrial dairy group in France. In 2001, about 85 % of the cheese was sold in GDO. Small firms have always had their own distribution network (creameries, restaurants…). About 3 000 tonnes of Roquefort cheeses were exported in 2001 in more than 90 countries all over the world.

Several blue cheeses benefit from a PDO, like "Bleu des Causses" cheese or "Bleu d'Auvergne" cheese, but the Roquefort cheese (the leader of the blue cheese market) is the only one that is produced with raw ewe's milk. The Roquefort cheese is commercialised at an average price of 13-15 € / kg, instead of 10 € for other blue cheeses. This difference is due to the high quality and also to the notoriety of the cheese, which is one of the most famous cheese in the world (see table below). We must notice that ewe's milk is always better valorised than cow's milk.

Price in 2000	**€ / kg.**
BEAUFORT	15,33
ROQUEFORT	**14,77**
OSSAU-IRATY	13,08
REBLOCHON	10,37
BLEU DES CAUSSES (blue cheese)	9,90
COMTE	9,12
SAINT NECTAIRE	8,53
CANTAL	7,92
CAMEMBERT	7,84
BLEU D'AUVERGNE (blue cheese)	7,43

Source : Confederation of Roquefort

2.2. Consortia and Interprofessional bodies

Since 1922, milk producers belong to the "Fédération Régionale des Syndicats d'Eleveurs de Brebis" (FRSEB). Similarly, industries have created in 1928 their own organisation : the "Fédération des Syndicats des Industriels de Roquefort" (FSIR). In spite of divergent logics, these two organisations became conscious of the necessity to agree with each other. In 1930, the "Confédération de Roquefort", was created, resulting from the union of the two organisations. By agreement with the INAO, the management of the Roquefort AOC is guaranteed by this organisation since.

The Confederation of Roquefort works as a real interprofession. The power of the two families (producers and industries) is equivalent because each one possesses one vote, and decisions are taken unanimously. The relations among actors are regulated within this organisation, especially when it comes to negotiating the price of milk. The management of raw material is also done collectively with respect to the fact that the Confederation has created in 1987 an original system in order to restrict an excess milk production (50 millions of litres collected in 1960 ; 90 millions in 1980 ; 120 millions in 1990 and 170 millions in 2000).

Today, the Confederation employs about 80 persons. It's organised around a livestock raising department, a quality department and also a marketing department.

Today, key words that characterise the supply chain today could be *cohesion*, *pereniality* and *self-governance*. *Cohesion* because the numerous crises due to divergent logics have always been regulated within the chain. *Pereniality*, because the chain managed to preserve his unity and to guarantee his reproduction in time. *Self-governance*, because the actors established very early their own rules, without referring to regional or national institutions. The best example of this self-governance is the system of payment of the milk, called "Individual Reference Volumes". In 1987, each milk producer obtained a maximal quantity of milk to produce calculated on the basis of the volume produced in the last four years (1983-1987). The milk transformed in Roquefort cheese (the most expensive) is called "class 1 milk", the milk intended for diversification (in particular feta cheese) is called "class 2 milk" and the milk sold at it is called "class 3 milk". Each class of milk has a different price, and the calculation of these different prices is very complicated and directly depends on the market.

However, the relations between the actors are far from being always friendly. During all the history of the supply chain (and still today), many conflicts took place between milk producers and industries. Those conflicts were concerning a lot of problem : the code of practice, the area of production, the price of milk and also the implementation of the system of three prices in 1987. This decision is at the origin of the most important crises for the Confederation of Roquefort, the eventuality of the discontinuance of the interprofessional organisation was even considered.

3. <u>Link with rural development.</u>

3.1. Area of production.

Today, economic activities linked with the Roquefort cheese concern about 2 400 milk producers and 1 700 industrial jobs (firms, dairies…). The economic weight of the supply chain is very important : in the south of Aveyron, it represents 45 % of total jobs and more than 50 % of the added value. If we enclose induced jobs (like transports for example), then activities linked with the Roquefort cheese represent about 10 000 jobs. The Roquefort cheese supply chain is definitively the key economic element in the region.

This very specific situation contributed to the emergence of a territory principally dedicated to milk and cheeses production. Many local and regional firms work essentially in connection with the Roquefort cheese supply chain (suppliers, providers of services…) and ensure its productive functioning :

- in terms of **logistics**, milk producers are linked for example with banks, farm equipment suppliers or livestock food suppliers. For the firms, we can cite supplying, carriage, packaging…
- the **relations with local costumers** are also specific, in particular with local supermarkets, which have different strategies concerning regional product sales
- the **quality management** also appeals numerous associated actors : milk controls, veterinary services, artificial insemination…
- the relations with professionals partners are very closed, in particular with guild chambers, chambers of commerce and chambers of agriculture.
- finally, the **research – development** is a very important stake which is realised at the same time at the collective level (Confederation of Roquefort) and the individual level ("Roquefort Société" for example). We can mention the existence of the "Centre de Ressources du Rayon de Roquefort" (Centre of Resources of the Roquefort Region).

To sum up, the Roquefort cheese supply chain seems to work as a real local productive system characterised by a relatively important capacity of adaptation in its economic environment. The specific resources built contributed to the emergence of an original pole of services and skills based on agricultural and agrofood activities.

In 2001, milk producers amount to 2 388. The decline of the population of milk producers has accelerated for many years (see table below), as it follows the decline of the population of French farmers.

Years	**Number of producers**
1992	2 759
1993	2 686
1994	2 649
1995	2 618
1996	2 582
1997	2 550
1998	2 517
1999	2 491
2000	2458
2001	2 388

Source : Confederation of Roquefort

The region of Roquefort is located in the South West of France. Many people in France and beyond consider that this region (called "le Sud-Ouest") is one of the most famous french region for its gastronomy (PDO wines of Bordeaux, foie gras…) and also quality of life. The reputation of Aveyron is principally due to the Roquefort cheese. We can notice other products in this region which benefit from the presence of the Roquefort cheese such as

PDO "vin de Marcillac" (wine), PDO "Bleu des Causses" and "Laguiole" (cheeses) and PGI "Veau de l'Aveyron et du Ségala" (veals). Nevertheless, Aveyron doesn't cary a well known gastronomy reputation like "Périgord" for example) because many people don't know where Roquefort is located in France, although everybody know the cheese.

In terms of employment and added value, the contribution of the Roquefort cheese to rural development of the region is enormous. As many deep rural territories in France, the South of Aveyron belongs to the "arid diagonal" ("diagonale aride") which crosses the country from Northeast to Southwest. This area is characterised by small densities. Thus, the fight against demographic decline is one of the most important issue in Aveyron, and the pereniality of the Roquefort cheese supply chain seems to be an essential condition for the preservation of the agricultural and rural population (18 inhabitants per km² in 1999 and an important part of farmers without succession). A local saying asserts : "*If Roquefort sneezes, all the region catches a cold !*".

The links between agriculture and rural development are therefore very closed. But the relations network among the Roquefort cheese supply chain and the local actors would be in its interest to be more developed, in particular from the endogenous development point of view.

3.2. Rural development tools.

In spite of its economic weight, the impact of the supply chain on rural development is not easy to measure. The enhancement of the area of production is certainly due to the presence of the product, but it doesn't seem to be a priority, in particular for a firm like Lactalis. For example, the link between agriculture and tourism is very thin. The main spot of interest of the region is the village of Roquefort-sur-Soulzon, where the caves are located (about 200 000 visitors a year). But there is no impact on the rest of the territory. As we can see it in other regions (Auvergne, Alpes), there is no tourist initiative such as the "Route des Fromages" ("Road of cheeses"), which could enhance territorial resources. However, a first initiative was born a few years ago, called the "Réseau de visites de fermes en pays de Roquefort" (visit of farms network in Roquefort country). It is actually the only one example of formal co-ordination between agriculture and tourism.

This situation is essentially due to the very valuable income generated by the activity linked with the Roquefort cheese. The supply chain unconsciously prevented local actors from making use of alternative development projects. This explains why agri-tourist trade is not very developed among milk producers. The sector-related logic has always been prevailing, and when they exist, relations between supply chain actors and institutional actors are usually conflicting by nature.

Nevertheless, we notice the emergence and/or the reinforcing of several local alternative products made with ewe's milk by actors located outside of the supply chain (for example the future AOC "Pérail de brebis" or small productions without any label such as "la Galette de brebis" (ewe pancake) or "la Brique de brebis" (ewe brick). The recent creation of the "Centre de Ressources du Rayon de Roquefort" follows this evolution. The "Roquefort territory" gradually tends to become a territory dedicated to the ewe, which in terms of rural development, open up new prospects.

3.3. Evaluation.

In order to evaluate the process of rural development, quantitative criteria are important but insufficient due to methodological problems : in fact, it is very difficult – indeed impossible – to analyse the dynamics really imputable to the presence of a PDO. Rural development depends equally on the weight of agricultural and agrofood activities on the territory.

Therefore, the evaluation of the process of rural development must be also based on its qualification : two approaches are then possible :

- an approach in terms of "local productive system" (in french : "système productif localisé"). It consists in analysing the relationships between the actors of the supply chain and their economic partners (providers of services, suppliers, logistic, research and development, formation…), and in evaluating the importance of the activity linked to the PDO for the region.
- a more "territorial" approach, which focuses on the analysis of the "non-productive" dynamics (in reference to the problem of the multifunctionality of agriculture) :
    - relations with local institutions
    - relations with tourist actors, restaurant owners…
    - implication of the supply chain in the territory
    - construction of positive and coherent territorial images

4. <u>Link with consumers and citizens.</u>

4.1. Image of the product and marketing differentiation.

The marketing of the Roquefort cheese has two sights : individual and collective. The individual marketing is done by firms which enhance their trademarks ("Roquefort Société", "Papillon", "Le Vieux Berger"…). The Confederation ensure the collective marketing through the enhancement of the name of Roquefort and the AOC. Contrary to other AOC cheeses like Comté, the origin of the product is not put forward. The advertising campaigns insist essentially on the know-how and on the age of the product.

Among competing blue cheeses, the Roquefort cheese seems to be the reference for consumers and positions in up-market products, notably because of a difference in prices (see table n°4). This difference can be explained by higher costs of production (raw milk, ewe's milk). The age and reputation of the Roquefort cheese differentiate the product from other blue cheeses. Nevertheless, the commercial success of the cheese leads to the emergence of imitation products, coming from Lactalis competitors such as the Bongrain group, which created the "Saint-Agur". With the help of an advertising campaign and a packaging relatively similar with the Roquefort cheese one, this trademark manages to position in the same range of products, with equivalent prices.

From the commercial point of view, the AOC label is an argument of sale, but the base of the success of the cheese is first of all due to the "Roquefort" denomination, given that a non AOC Roquefort cheese cannot exist.

4.2. Strategies.

We said that 85 % of Roquefort cheese were sold in GDO. Each firm possesses a large range of products (weight, aspect, marketing...), completed by a set of other products done with ewe's milk (cheeses, creams...). This variety shows itself in prices : the prices of the least expensive Roquefort cheeses fluctuate between 11 and 13 €, whereas upmarket Roquefort cheese is about 20 €.

Finally, an other important characteristic of the Roquefort cheese supply chain concerns the strategy of diversification. Today, the transformation into Roquefort cheese represents only 50 % of the collected milk in the region of production. The remainder is processed into alternative products, and notably into feta cheese (see schema below). The payment system of milk takes into account this diversification because the milk transformed into Roquefort cheese is dearer than the one transformed into féta (1,10 € against 0,70 €). The milk sold at it amounts to 0,30 € on average. The maintenance of high prices for feta is at present called in question by the European decision which allows the PDO to the Greek producers of feta. The use of this denomination will be forbidden for all the other countries. French producers will be obliged to change their practices, in order to be in accordance with the European regulation.

The quantity of milk transformed in Roquefort cheese depends directly from outlets but is in general managed collectively. When an industry runs short of milk, he can be supplied by another. This co-operation is possible because there is no official individual agreement between industries and milk producers. Moreover, we can ask ourselves if those practices are compatible with the competitive practices authorised by the law.

The ewe's milk in the Roquefort region in 2000
(source : Confederation of Roquefort)