Analysis of the French demand for oysters and mussels, within the European market

Sophie Girard*, Catherine Mariojouls**,

*IFREMER- Service d'économie maritime, France ; **Institut National Agronomique Paris-Grignon, France.

Abstract : Shellfish farming is the most common and the most established activity of aquaculture in France and in EU15. Such as main suppliers of mussels and oysters, mariculture production makes up the referent market for bivalves molluscs, unlike most other aquatic species for which capture fisheries are prevalent. Moreover, the specificity of oyster cultivation is marked with respect to the French position which is both leader and almost self sufficient on the European market. The sustainable development of shellfish farming is analysed through a "demand-oriented-approach". The field of the study covers trading and marketing issues as well as consumer analysis. The comparison between the mussel and the oyster market highlight some key differences, in terms of distribution network, identification of origin and products differentiation, consumer profiles and regions. This lead to examine deeply the ways of market segmentation in relation with the image of the product and the consumer expectations. Quantitative surveys, mainly consumer panels, are used over a 15 years period to attempt a dynamic approach of the "age" criteria (consumers' life cycle and generation effect). This is completed by a qualitative analysis of consumer attitude towards shellfish and an overview of the current innovation process in the two sectors concerned.

Key words: shellfish, bivalves, seafood market, consumer survey, demand analysis, distribution channels

1. OVERVIEW OF THE EUROPEAN MARKET OF BIVALVES

1.1 Production

Shellfish farming is the most common and the most established activity of aquaculture in EU15. Over the last ten years, the total of bivalve molluscs catches amounted to about one million metric tons, including 700,000 to 850,000 metric tons from aquaculture.
The production trends from official statistics rose slightly, and the global catches barely exceeded one million metric tons at the end of the period. The production within EU15 is sharing between southern and northern countries, but reflecting a double division, into geographical area and per production processes.

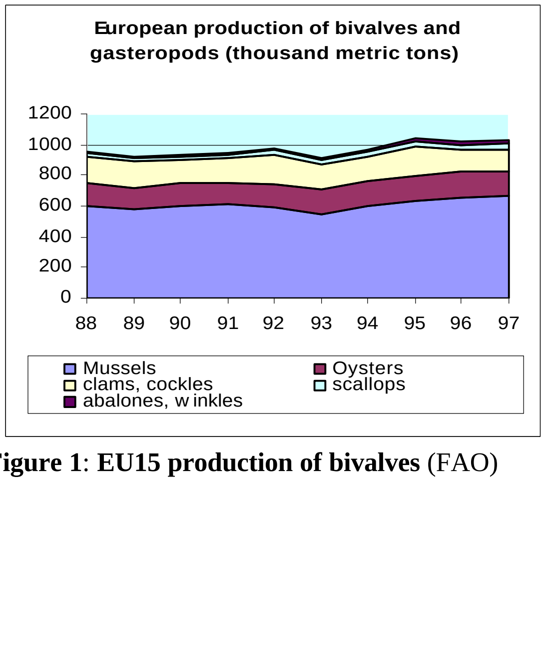
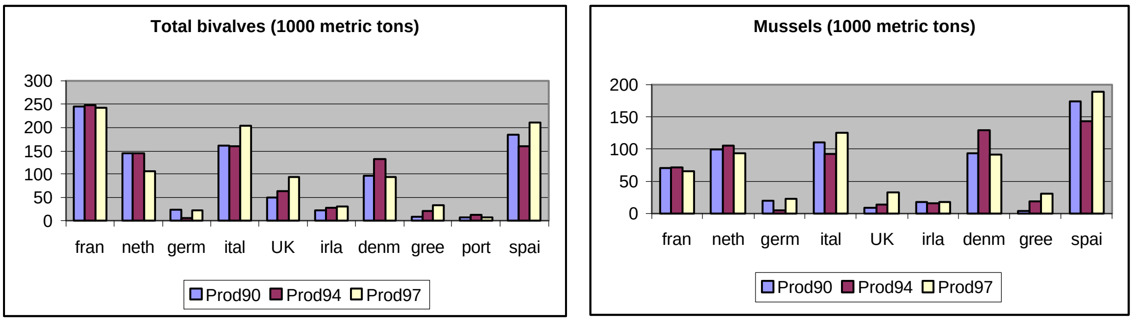


Figure 1: **EU15 production of bivalves** (FAO)

The leaders (France, Spain and Italy) are mainly involved in farming while the first northern producers are more fishing countries.

In terms of species, the leading production of mussels (*Mytilus edulis* and *Mytilus galloprovincialis*) is also the most widespread and the most dynamic. In spite of significant fluctuations over the last decade, due in particular to environmental concerns in Spain and the Netherlands, the sector of mussel cultivation registered a slight increase during the period (from 600 000 to 700 000 metric tons including dredged mussels). Diversification investments have been made in Ireland and in Greece, resulting in current production of around 15,000 metric tons in Ireland and 30,000 tons in Greece.
In contrast, oyster farming is specific to France and rather static, with respect to both processes and capacity of production. The history of the oyster cultivation in France, time-marked by successive diseases affecting the livestock, led to the supremacy of mono-species farming, based on the Pacific cupped oyster C*rassostrea gigas*. The yearly production of oysters in France levelled out at 130,000 – 150,000 metric tons, while marginal productions are recorded in Ireland and Spain (around 3000 metric tons).



Figures 2: **Main producers of bivalves and mussels among EU15 countries** (Source: FAO)

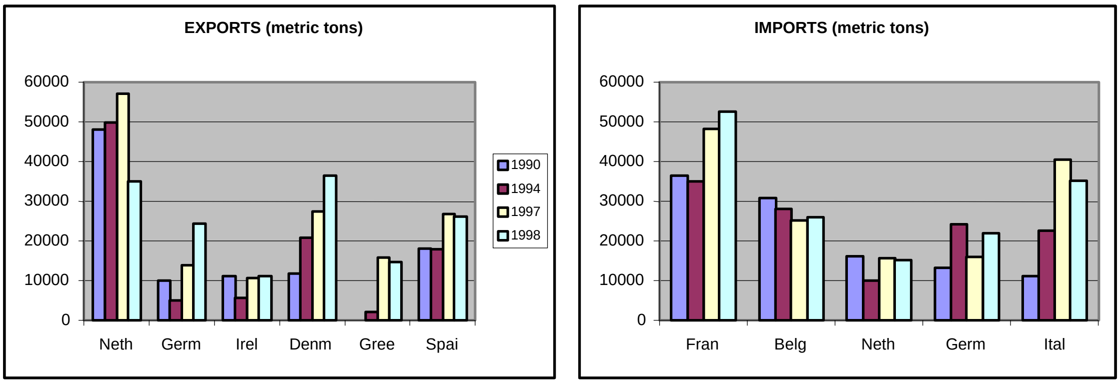


Figure 3 : **Main purchasers and suppliers of mussels among EU15 countries** (Source : Eurostat)

1.2 Foreign trade

Globally, the bivalves molluscs market of EU15 is self-supplied, with an extra-European deficit amounting to less than 0.2% of the total production in volume[1]. The first products to show a deficit are scallops, for which wild domestic catches are not enough for European demand. Almost all the European trade is intra-EU, with an exchange flow of nearly 200,000 tons, i.e. near 20% of the total market.

The last decade trend illustrates the prevalence and the development of the mussels trade within the European market. During the 1990-1998 period, the sum of imports (or exports) flows was up +50%, from about 110,000 to 170,000 metric tons. France, Belgium and Italy are the leading importers of mussels, while the Netherlands, Denmark and Spain hold the position of main suppliers (Figure 3). The majority of the current trade concerns fresh mussels. Actually, the preserved and prepared mussels did not exceed 15% in 1998. The main supplier of preserved mussels, Denmark, reduced this export activity at the benefit of fresh mussel trade, which could explain the high increase of the total exports of mussels, expressed in net weight.

[1] According to Eurostat database, the deficit of European trade towards the rest of the world represented less than 20 000 metric tons in 1998, including 10 500 tons of scallops, without shell for the majority.

1.3 Apparent consumption

However inaccurate the available statistic sources are, the evaluation of apparent consumption data shows that the bulk of the European market of bivalves takes place in the three main producer countries, France, Italy and Spain. Intermediary markets are represented by the Netherlands, Denmark and the United Kingdom

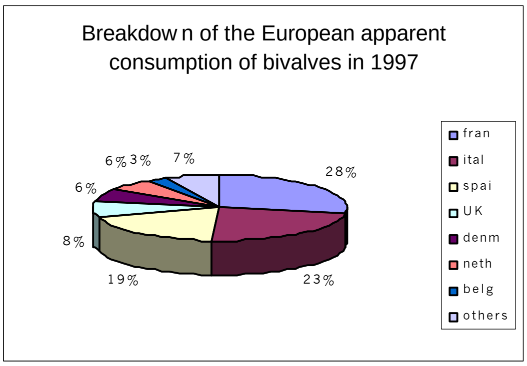


Figure 4: **Breakdown of EU15 bivalves market** Sources : FAO, Eurostat

The link between the production and the consumption area is attached to the dominant consumption mode, in fresh and whole form. This remains strong even when a large part of the production is dedicated to the cannery industry, like in Spain.

The yearly consumption of the Italian, French and Spanish amounted respectively to 4 kg, 5 kg and 6 kg per capita in net weight in 1997. The share of bivalves within the total seafood consumption remained quite steady from 1988, about 20%. It is interesting to point out that the shellfish consumption is in keeping with the food pattern of South-European countries, which distinguishes from the Northern by a superior consumption of seafood and a preference for fresh fish. The case of Greece is apart, in that the recent growth of aquaculture production is partly aimed towards export, concerning fish as well as shellfish.

1.4 Position of the French market of bivalves

French oyster farming provides an example of an almost-autarky production system, with marginal exchange flows compared to the whole domestic production. The specific way of oyster consumption in France, in live form, probably explains the persistence of a "protected sector" within the growing internationalisation of the seafood market. Sanitary requirements constitute, till now, the most efficient trade barrier towards extra-EU competitive supply. The world geography of oyster production, which is mainly located in the Pacific Ocean and Asian countries (China is by far the largest producer of oyster in the world, concentrating 71% of the whole supply, according to FAO data) makes the French specificity more acute. Trade potentialities from North America, the second production area, are quite limited with regard to the whole production level of this region which little exceeds the European, and indeed the French oyster farming.

Although more open to imports, the French market of mussels is still dependant on domestic supply by 60%. The two market segments of *Mytilus edulis* and *Mytilus galloprovincialis* are well specified and separated, showing a real correspondence between their respective areas of production, trade and demand. Moreover, the French consumer preferences towards fresh mussel, which especially put forward the called "bouchot" mussels, enforces a referent frame to price competition at the European level.

2. QUANTITATIVE APPROACH OF THE FRENCH DEMAND FOR MUSSELS AND OYSTERS

2.1 Main attributes of demand for mussels and oysters

The SECODIP panel survey is the main source of quantitative data that exists concerning French seafood consumption, and the only one available for analysis of distribution channels and consumer profiles. The consumers' panel is composed of a sample of about 4500 ordinary households (in the INSEE sense of the term) considered to be representative of the French population. The variables registered by the consumers enable us to break down the overall demand into its two components, i) the rate of purchasers among the panel, ii) the yearly consumption per household. The evolution of the first variable is presented in figure 5, such as the best indicator of consumption trends in the case of oysters and mussels.
During the 1984-1995 period, which corresponds to a steady methodological approach, a slight decrease in oyster demand can be observed (although the significance of such an evolution is difficult to establish from a statistical point of view). On the other hand, the break in the series resulting from methodological changes in 1996[2] shows the sensitivity of data to panel composition. In spite of a similar breakdown of households, with respect to economic and demographic criteria, the demand indicators for mussels and oysters dropped, losing respectively 10 points and 8 points. This fall may clearly be related to the fishmonger-going decline registered with the new panel, which emphasises the difficulty in evaluating the real potential of traditional outlets throughout overall retail market. The fact is noteworthy enough, in particular for fresh and specialised products, to be taken into account. It should induce a careful analysis of consumer panel data, taking carefully into consideration the interference of extra-economic field attitudes in measured values[3].

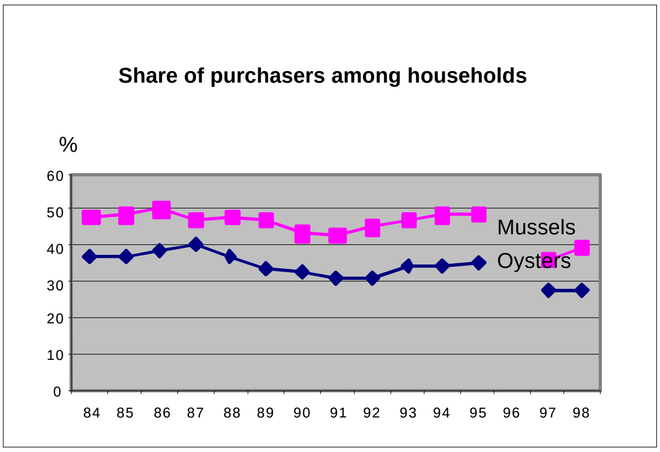


Figure 5: Household consumption rate for oysters and mussels (Source: SECODIP survey)

Among the distinguished features of oyster demand, consumption occasions are deciding factors. French demand for oyster remains seasonal and festive, with a

[2] The two main changes that SECODIP made, were to replace the questionnaire on paper by an automated product scanning system and to open the households sample to single male.

[3] In retrospect, it appeared that the former panel was composed of households with more "traditional" buying habits, and different lifestyle compared with new panel.

peak of purchase round Christmas and the New Year's day, in spite of the efforts involved in broadening the consumption season.
The persistence of a traditional pattern in oyster consumption is confirmed by the distribution channels on the retail market: specialised outlets still represented near half the household purchases in 1998 (versus 33% for the total chilled seafood).
Finally, French demand for oysters is limited to less than 30% of French households, bearing in mind that the acceptability of the oyster with respect to its opening process and its consumption way (alive form) requires some learning and handing down of cultural food habits.

In contrast, the mussel consumption proves more standard. Between 40% and 50% of French households purchase fresh mussels, which represents a significantly high rate, in fact slightly higher than the customers rate for fresh salmon and cod - as the leading fresh fish markets in France - but below consumption rate of shrimps. Mussels are eaten mainly cooked, as a starter or a main dish, and in this forms, offer more consumption opportunities than oysters. Mussel consumption is considered popular and convivial, and the recent development of value-adding operations (cleaning, packaging…) matches consumer expectations towards convenience and quality. Moreover, the importance of the out-of-home consumption have to be pointed out, since it shows the popularity of "mussels and chips" dishes served in many restaurants and brasseries[4].

2.2 Consumer profiles analysis: the importance of "cultural" and "economic" factors.

2.2.1 The main criteria analysed in fresh seafood demand

Consumer panel surveys provides results according to several criteria, as geographical factors (region, type of habitat), age, size of family, category of income.

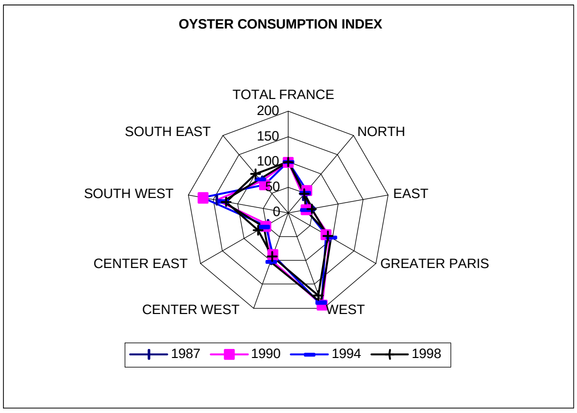
In Figure 6, the consumer profiles for shellfish are expressed in index and compared with the overall market of fresh seafood. An index 100 relates to the average level of consumption in population, while an index superior to 100 is attached to the over-consumer categories, and *vice versa*.
Two-person households, belonging to upper middle class and without children constitute the typical profile of fresh seafood consumers. Regional and age criteria are the most discriminating factors, highlighted by both the importance of West region demand, the over-consumption of senior purchasers (more than 50 years-old) and the under-consumption of the youngest (less than 35). In the case of fresh shellfish, the consumer profile becomes more marked in fresh oysters and scallops, resulting in a strengthening of the regional and age criteria and a targeting of further higher level income. Even less marked, the profile of the mussel consumer seems to belong in the relatively old aged bracket, whereas its other characteristics differentiate it.
It seems clear from this table that oysters have all the characteristic features of specialised, regional and "traditional" products, and come close to "fresh whole fish" in terms of consumer profile, while mussel consumption would appear less specific and more popular, in compliance with previous qualitative observations. Moreover, it is interesting to note, from the example of another mass shellfish market, like shrimps', the slowness of food habits evolution faced with the development of new aquaculture production. The demand for fresh shrimp remains higher in traditional areas of fresh seafood consumption, in spite of a real standardisation of such aquatic products in the French retail market.
At the end of this consumption criteria overview, and initially brushing aside the existing interactions between these criteria, it seems applicable to examine the relevance of the opposition between cultural and economic criteria. Firstly, region and age would be classified in the first group and other set of variables included in the buying power deciding factors.

Criteria		Total fresh seafood market	whole fish	oyster	mussel	scallops	shrimp
Region	index<50					East, Center, South	
	index>110		S.East	S.West, S.East	North, West, S.East		West
	index>150	West	West +	West ++		Greater Paris	
	index>200					West	
Age group	index<50	less than 35 years	less than 35 years	less than 35 years-		less than 35 years-	
	index>110	over 50 years	over 65 years	over 65 years			over 50 years
	index>150		[50-64]	[50-64]	[50-64]	over 50 years	
income level	index<50					low income	
	index>110	upper middle	upper middle	high & upper middle +	lower middle	high & upper middle +	high & upper middle
	index>150						
Household composition	index<50						
	index>110	2 persons, without children	2 persons+	2 persons+	2 persons	2 persons	2 persons -
	index>150						

The signs + or - are indicated in comparison with the consumer profiles for fresh seafood

Figure 6: Synthesis of the consumption criteria on fresh seafood markets
Source: adapted from SECODIP data

[4] The results of the GIRA study carried out at OFIMER's request in 1999 show the importance of the catering sector (44% market share in volume) in the overall consumption of mussels (Paquotte, pers.com.).



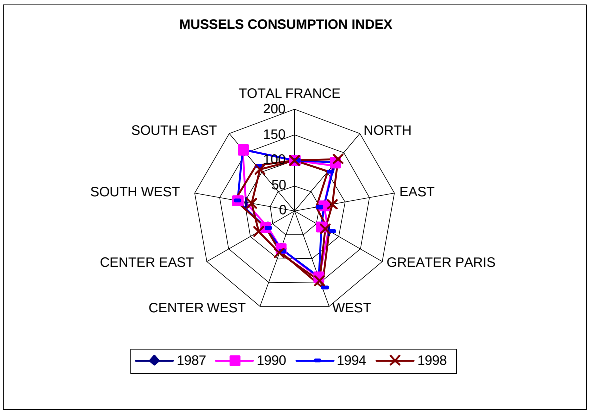


Figure 7 : Regional consumption index for oysters and mussels

Source: Secodip

2.2.2 Regional criteria: the influence of the proximity to production areas

Among geographical variables, the region is globally a more discriminating factor of household seafood consumption than the type of habitat (determined by the size of the town or city). In the field of French seafood consumption two traditional patterns are superimposed. The first one, which distinguishes the North/South consumption is valid as far as fresh seafood is concerned, compared to frozen seafood. Nevertheless, the second pattern based on the differentiation West-East (e.g. approximately coastline-inland according to French geography) remains the most relevant in terms of fresh seafood habits.

The regions selected by SECODIP are quite large, and inevitably skate over inter-regional disparities. In this way, the West region delimited by SECODIP is a very wide region, including all coastal counties from the Channel to the mid-Atlantic, with the Southern limit located near *Bordeaux* [5]. Therefore, it is not surprising that the West region leads other regions in terms of oysters and mussels purchases, bearing in mind that it concentrates around 70% of the French production of farmed bivalves. The proximity with other main areas of oyster production also ranks the population from Southwest region among the over-consumers. Furthermore, by taking into account the French imports of mussels, the consumption area of mussels spreads to the North and, occasionally towards the Southeast.

As far as fresh bivalves are concerned, the regional analysis highlights the cultural and structural aspects of consumption. In the long term, the regional criteria is proved to be a stable factor of consumption for local and raw aquatic products, and only tends to be reduced with the increasing processing degree.
Source: SECODIP

[5] According to SECODIP division, the West region gathered 19% of the French households in 1997, and so represented one of the leading regions for consumption, on equal terms with the Greater Paris region.

2.2.3 Age variable and economic criteria: an effect of generation or of life cycle?

The influence of age on consumer behaviour is studied concomitantly with economic variables in order to study the generation effect and the socio-economic incidence of the period with regard to chronological time or individual life cycle (Boulet and al., 1997). In the figure 8, the evolution of oyster consumer profiles is observed throughout several yearly referent points covering a 15 year-period. Although too short to represent one generation gap, the diachronic analysis already highlights some striking changes, in terms of age and level of income variables.
The general profile diagram for oyster shows the prevalence of the age criteria, which i) clearly opposes people over 50 years-old to the youngest categories ii) attests that the level of demand from the under 35 years-old purchasers is really low. At the same time, socio-economic criteria are nearly as selective and favour the households provided with superior buying power, the level of which resulting from both the income and the number of people in the household. An exception to this economic segmentation is given by the one-person households, which are clearly not part of oyster purchasers. Except for in supposing that all single persons are young and come from the low income brackets, the deficit of oyster demand from single people, has to be related to extra-economic factor, such as the festive and convivial characteristics of the product, as well as to particular use constraints[6].

During the 1983-1998 period, the progressive ageing of the consumer profile is obvious, and even worsened by the new panel methodology. The opposition between young and senior purchasers has been increasing, and the evolution of the consumption index shows the deficit of “new” consumer recruitment and suggests at least initially a “generation” effect.

[6] In surveys about consumer attitudes towards oysters, the main limit put forward refers to the difficulty in opening oysters, especially for women.

Concurrently, the "period" effect has become apparent throughout the 15 years. The positioning of the oyster in income terms has also become acute, with an enlarged gap between the two extreme categories of households. The price of oyster, compared with other festive substitutes which prices have declined, is likely to become an additional restricting factor towards oyster consumption, due to the reallocation of the household budgets in terms of optional consumer goods.

According to the latter hypothesis, based on the life cycle of the consumer, the disaffection from the youngest people could be read as a consequence of insufficient income, and the increase in buying power throughout the life of households, would ensure the renewal of the purchasers. This scheme is partly confirmed, due to the persistence of the global profile of oyster consumption by age category, but a break in the trend of consumption behaviour has also become apparent over the last 15 years.

The shift of the under-consumer category from the first age class to the second one [35-49] will induce in the future, if they keep the same behaviour, an effective drop in oyster demand which excessively depends on "senior" food habits. All the more because the dietetic concerns, which could be taken into account in the evolution of the diet with time, are less arguable in the case of oyster than fish. Not due to a lesser dietetic quality, but owing to the fact that the oyster is not consumed as a main course, but as an optional and very occasional product.

The analysis of fresh mussel consumer profiles provides interesting elements of comparison and is likely to raise other questions. The age structure of mussel consumers is not so marked as the one of oyster consumers, in spite of the growth of the consumption index among the most aged households and the progressive under-consumption of the youngest. But, due to the slight upward trend of French mussel consumption, and since the move of consumers towards the superior age class looks discontinuous, it is possible to implicate the "period" effect again. With regard to the current consumer expectations towards the "image" and the "convenience" of the products, it becomes apparent that the mussel market will have to supply the customers with more and more information and services. From that point of view, the relative decline of demand for fresh mussels from the youngest households may be related to some changes in consumer behaviour, especially the transfer to other consumption way or place, such as restaurants.

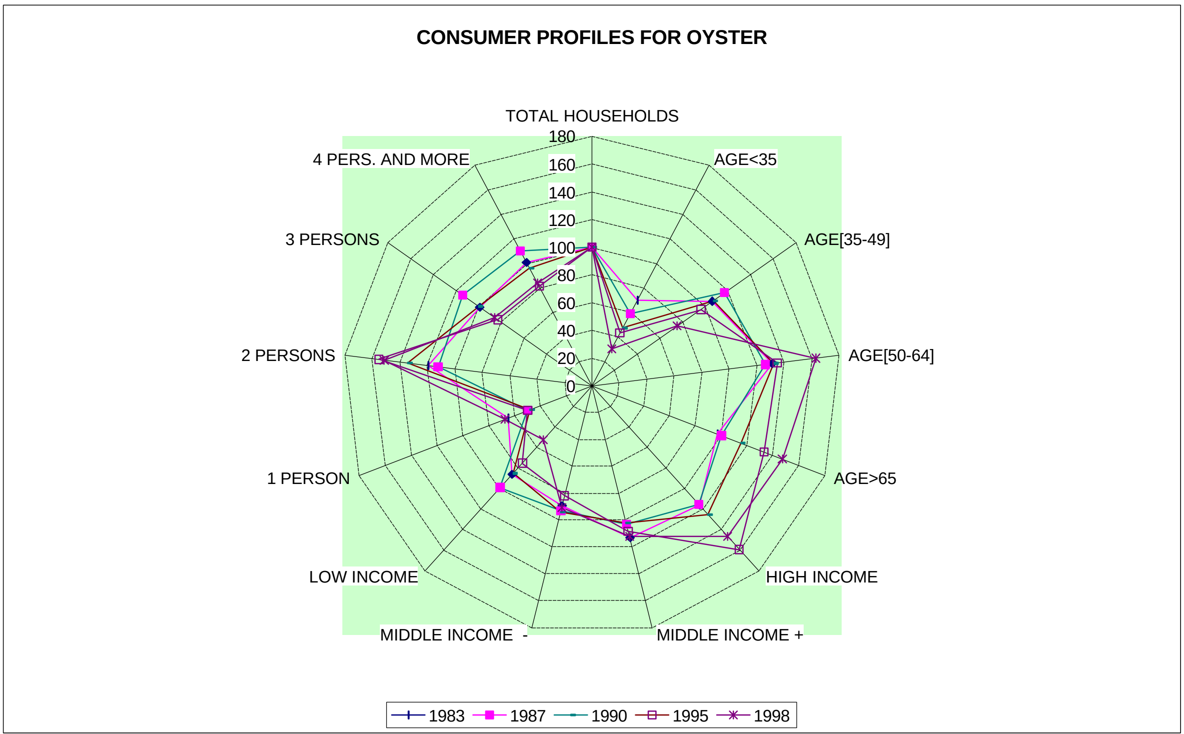


Figure 8: Consumer profiles for oyster according to three criteria (Source: SECODIP)

3. SEGMENTATION AND DIFFERENCIATION IN THE FRENCH MARKET OF FRESH MUSSELS AND OYSTERS

3.1 The segmentation of markets

As we have been showing briefly in the first part of this paper, the French markets for oysters and mussels differ fundamentally: oyster market is supplied by domestic production for the very main share, while mussel market is typically an open and multi-product market, supplied by domestic production and imports from several countries.

For the French oyster market, the mass market is the market of the cupped oyster *C. gigas*, supplied by several production regions. There is a traditional segmentation based on the production zone, but it is not totally clear, and cannot be considered as known by all consumers. The Region Marennes-Oléron, able to insure a final fattening of the products ("*affinage en claires*"), occupies, at a national scale, the top place for the market share (more than half of the production) and the notoriety of products. On the opposite, in the direct sale from producers to consumers (sales at the farm, and at open-air markets), representing a high market share (30% and more), the notoriety of the region and the producer himself play an important part. Nevertheless, no clear hierarchy of prices between regions can be observed on the market at a national level, if we compare the level of retail prices observed through consumers panel surveys (Fig 9). A segment that can be considered apart is the market of European flat oyster *Ostrea edulis*, indeed a premium product, known mainly by connoisseurs and available in small quantities (about 1% of the market) at high prices.

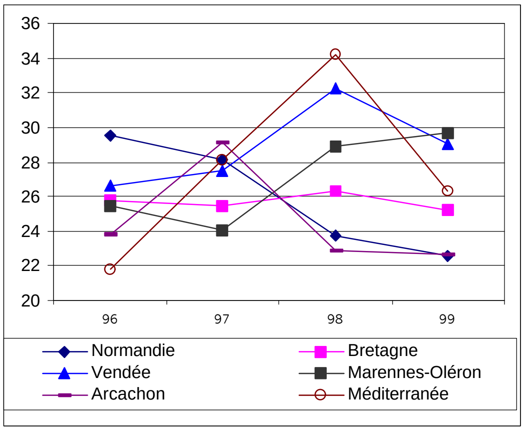


Figure 9: Retail prices (1998 FF/kg) of cupped oysters according to the region (Source: Secodip)

For mussels, the supply of French market by different origins (Figure 10) naturally creates segmentation commonly accepted and known by all users, including consumers.

Considering the retail prices (Figure 11), French bouchot mussels (small to medium size *M. edulis*) occupy the first grade, then an intermediate position is for mussels from French Mediterranée and Spain, which in fact are similar products (large size *M. galloprovincialis*, obtained by hanging culture).

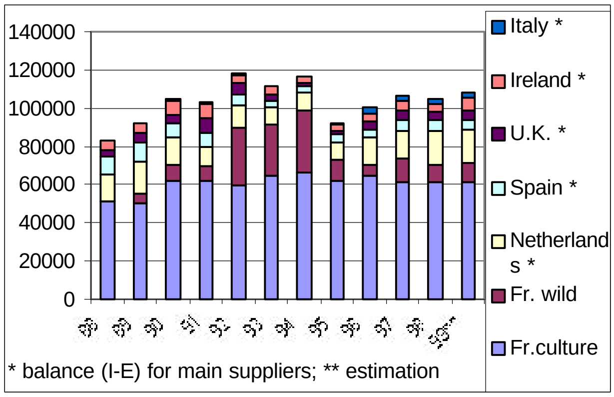


Figure 10: Supply (metric tons) of the French market in fresh mussels (Source: Eurostat, Ofimer)

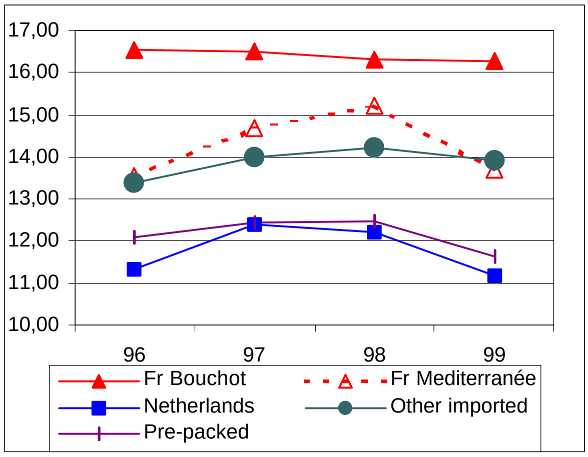


Figure 11: Retail prices (1998 FF/kg) of fresh mussels on the French market, according to the origin (Source : Secodip, Ofimer)

The average import prices, and production prices for French products (Figure 12), confirm the relative position of the domestic products and of the set of imported products, and inform about the situation of the other imported products: the mussels from UK and Ireland show a lower price than the Spanish mussels, but with a marked trend to increase and reach an intermediate position. On the opposite of what is observed for retail prices, Dutch mussels show high import prices. Paquotte (1995), who studied in detail the French mussels market, explains this by the fact that Dutch mussels are mainly distributed in supermarkets, who sell at lower prices than traditional distributors. Another explanation is that the Dutch production and exportation to France has been touched by a severe 90's, with an influence on the price, unlike for Spanish mussels.

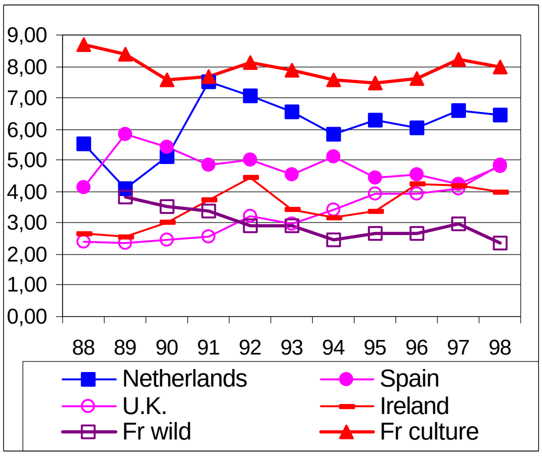


Figure 12: Average price (1998 FF/kg) of fresh mussels at import or production level in France (Source: Eurostat, Fiom-Ofimer)

On a seasonal point of view, the importation play a complementary role to the domestic production (harvest interrupted in winter due to reproduction) in the supply calendar (Figure 13). Netherlands supplies mussels in winter, summer and fall, UK and Ireland in winter, Spain exports to France on a regular basis all year long, and the growing flow from Italy supplies market at a period of deficit. Nevertheless, winter corresponds to the period of lowest demand (Paquotte, 1995), and it is unlikely that importation could develop very much, even at that period with little competition from other products. There is obviously substitution between products, and this is a quite complex phenomenon, which would require a precise analysis, taking into account their respective notoriety and usage, and the variations of prices, along with the supplies according to the years.

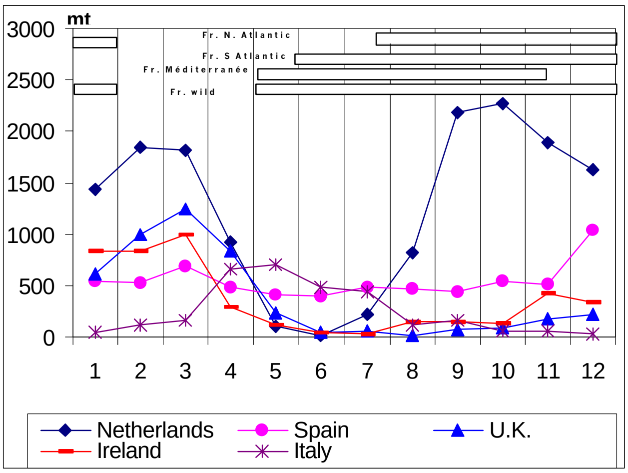


Figure 13: Seasons of importation and production of fresh mussels in France
Source: processed data from Eurostat (for average monthly importation in mt, for 1996,1997,1998), CEP, Ifremer

3.2 Towards a growing differentiation of products

3.2.1. Differentiation through the creation of trademarks and certification

For the Bivalves cultured in France, a strong trend towards a differentiation of products has been observed recently, from the middle of the nineties. The first step in the differentiation of products has been the creation by professional bodies of collective trademarks with logos, showing up a clear distinction between the regional origins for oysters (Normandy, Britanny, Vendée, Méditerranée) and between the mussels cultured (with two possible techniques: bouchot mussels, rope mussels), and the wild mussels of lower value. The only exception is the Basin of Marennes-Oléron, which created early (1974) its trademark, that likely has been playing a part in its commercial success. It is interesting to notice that most of these collective trademarks have been defined with no specification list, the trademark being used under the responsibility of the producer himself. In fact, the creation of these trademarks can be interpreted as a first manifestation of the need to secure the traditional market segmentation. Simultaneously with the creation of these collective trademarks has been observed a second form of differentiation of products, through the entry of cultured Bivalves in the approach of "quality signs" and certification, familiar to agro-food products but not to aquatic food products up to that time. These actions followed an official French procedure of certification. They have been developed at a local scale (Label rouge for the oysters "fines de claires" from Marennes-Oléron, project of AOC for the mussels of the Mont St Michel Bay).

Must be quoted also the creation of individual trademarks by shellfish wholesalers, on a more continuous trend, but concerning a small amount of products. Finally, all these trademarks, labels and signs represent a complex collection which can be confusing to the consumer, as underlined by Charles and Paquotte (1998), who studied them and set up a typology.

Another step today is to develop a more structured and solid differentiation at a national level through certification procedures. A certification list is currently being set up for the Bouchot mussel, in order to create a national CCP ("Certification Conformité Produit"). A similar approach at the national scale is planned in order to certify the farmed cupped oyster. In order to protect the names of the production zones, some procedures of certification under European (PGI, PDO) or French (AOC) procedures, are undertaken or planned at the regional level. Globally, this third set of operations can be regarded as a complement to the first one, setting up a reliable certification for a similar range of products. These actions are confirming the geographical names or technical names used as collective trademarks, adding an explicit set of characteristics in their definition, instead of the implicit meaning that the traditional products were bearing.

For oysters, the willing of the professional sector to propose to consumers a more clear range of products is also visible in two recent national operations: the definition in 1999 of three types of oysters relative to the water/meat content, with a national campaign of communication towards consumers, and simultaneously, the revision of the national norms defining the commercial categories of sizes for oysters, aiming at a classification more understandable and adapted to the range of existing products.

This trend to a differentiation in the oyster and mussel markets can be compared with the trend seen in the markets of other food products traditionally sold as generic products (bread, meat) in France. Starting from mass markets, there has been a segmentation for a part of the production, through the certification of particular products already existing (meat of such region or breed), or the creation of new products (new types of bread), using trademarks to make them visible. For bread, the creation of special products with a quality standard and trademark (example of Banette) was managed by medium-sized millers to improve their competitive advantage on their main market, the market of traditional bakers faced with a severe competition from the supermarkets (Raynaud, 1999). For the beef meat, the differentiation into labels and collective certified brands has been a way to fight against a decrease in consumption, and indeed a way to reassure consumers, particularly after the BSE crisis (Sans & Fontguyon, 1999) . The need to reassure consumers, coming back to the notions of "soil" and "nature" is, surprisingly, also reaching the sector of cultured bivalves: for instance, some recent specification lists for oysters mention "the use of diploid oysters", rejecting the use of "triploids" (sterile, avoiding to stop the sales in summer) that could be interpreted by consumers as Genetically Modified Organisms, which they are not. In future, the question for French shellfish farmers is whether they want to communicate on their products as "natural" products, very similar to the wild Bivalves, which has been the statute of these products up to now, or as farmed products, with specific characteristics.

3.2.2 Differentiation through technological innovation

Dutch companies have been the first, more than ten years ago, to propose mussels in family pack of one or two kilos, washed, debyssused and ready to cook, bringing a convenience quality. The recent period is characterised by a growing differentiation of fresh value-added mussel-based products, produced in Netherlands, Ireland, France, all bringing convenience: fresh cooked dishes, pre-cooked mussels vacuum packed, intermediate products. And in the last year has been passed a new step in the same direction, with the technological revolution represented by the creation of a new packaging for living bivalves under modified atmosphere or vacuum, bringing together convenience quality, perfect freshness and hygienic quality.

For oysters, the invention during the last years of the pre-opened living oysters has created a new niche market, which may develop.

3.3 Commercialisation and organisation

It is worthy mentioning here that a differentiation of products is also being created in relation with new forms of commercialisation. In a traditionally individualistic sector, we observe the creation of some association of shellfish producers, selling their products under a common trademark allowing a better competitiveness for trading and marketing. On another hand, the multiples are also contributing to that general trend of product differentiation, through the development of contracts signed with farmers, whose products must comply with qualitative specifications defined by the multiple. The concerned products are certified and sold under a peculiar trademark. This is introducing a new role for the multiples, who had formerly based their commercial strategy mainly on low price, and allows to speak a new "mode of co-ordination" between actors, different from the purely "commercial" one described by Charles and Paquotte (1998), and that can be qualified of contractual.

The role of professional bodies in setting up a differentiation of products through collective marks, or certification of different kinds has been very important in the last decade. It was first mainly due to the regional bodies SRC (Section Régionale Conchylicole), but recently the CNC (Comité National de la Conchyliculture) turned to a more leader position, with a new statute of inter-professional body, and a real strategy for the sector, aiming the differentiation of products with the means described upper. Another important change in the last years is the creation, in all production regions, of new Producers Organisations, which are regarded not only as in charge of market organisation, but also of the actions for developing a differentiation of products.
The professional organisation, and more widely the professional cohesion, is a key factor for the success of actions aiming to develop competitive advantages through a new differentiation of products. The project of AOC for the mussels of the Mont St Michel Bay failed not because of the project itself, which was unofficially accepted by the certification body and responsible administration, but because it was refused by a part of the producers, feeling set apart from the use of the name of the production zone.

Starting from a very individualistic sector, France has been very late setting up collective actions to improve commercialisation. Netherlands has been historically the first country to set up a very efficient collective system for the sales of mussels. Not only the landings are located in one harbour, Yerseke, but also the Mussel

Board is in charge of sampling mussels of each producer, allowing to characterise the quality through objective measurements, all this being a unique example of a collectively organised and transparent market for bivalves. Spain, through the Cofradias, had for a long time a professional organisation for production, but found in the "Regulation Council" created in 1994, a way to organise the market in a more efficient way, with new standards, and quality certification.

4. CONCLUSION

The long term analysis of consumer panel data has allowed to highlight some deciding factors of French demand for fresh Bivalves. Concerning the oysters, the analysis of consumer profile during 15 years provides convincing elements to uphold the “generation” aspect of the consumption, independently of evident restricting economic factors. Nevertheless, it is necessary to moderate these conclusions by looking into the limits of such consumer panel surveys more precisely. A first bias could be mentioned, as the existing gap between the household purchases and the effective consumption, above all when examining the impact of sociological and demographic criteria. One mistake would be to dedicate the oyster purchases only to the consumption of the households, whereas the majority of the consumption takes place during festive and familial occasions, and is likely to concern an enlarged table. The correspondence in criteria terms, which usually exists between household purchases and at home consumption, then becomes unrealistic. So, a field of investigation is open, in order to suggest a quantitative approach of consumption which lies beyond the survey of household purchases, especially in the case of non-regular and optional food.

Despite these reservations, the interpretation of SECODIP data with respect to economic and demographic criteria clearly shows the changes occurred in the purchase behaviour and raises the question of the disaffection with oysters from the new generation. Consumer attitudes towards oyster make it a “cultural” product, not so much emblematic than wine, but also belonging to the national culinary heritage, and reflecting a real fondness to traditional production and consumption way. Moreover, the industry has to cope with problems such as environment and customer sensitivity to natural products and processing. This illustrates the critical challenge the production sector has to take up, which consists both in defending the “natural” image of the product and the cultural value that people are very attached to, and in ensuring the boosting of oysters buying with the young “generation”.

Through the analysis of mussel demand, we also put forward the limits of consumer panel surveys, which cannot account for the total national market, due to the important share of the catering sector. Then, additional studies have to be launched on this sector, especially to tackle the question of “convenience” within the field of seafood products.

Another purpose of the paper was to analyse the situation of the French sector of bivalves cultivation within European or national competition, in relation to the differentiation strategies set up in answer to current consumer expectations. The traditional segmentation of the mussel and oyster markets in France is under evolution, because of a double trend: one is to confirm the existing segmentation through setting up labels and certifications, another one is to create a new differentiation of products. This may reach to a more clear segmentation in the oyster market, while the mussel market, more complex with different products, will probably go through a lot of evolutions, as this trend to differentiation appears to be at the European scale.

Acknowledgements: to Gaële Daniel, graduate student, for her contribution to data processing.

References

Anonymous, The world market for mussel, Globefish Research Programme, volume 55, August 1998.

Boulet D., Laporte J.P., Aigrin P., Mélani Ch., La transformation des comportements alimentaires : cycles de vie et effet de génération : le cas du vin., *Economies et Sociétés*, Série Développement Agro-alimentaire, A.G. n°23, Septembre 1997.

Charles E., Paquotte P., Product differentiation and quality approach in the French market for oysters and mussels, in *Proceedings of IXth Conference of IIFET*, Tromso, Norway, 35-42, 1998.

Girard S., Mariojouls C., Paquotte P., Wisner-Bourgeois C., An analysis of seafood consumption survey methods in France, in *Proceedings of IXth Conference of IIFET*, Tromso, Norway, 679-691, 1998.

Girard S., Annual French report per country on seafood consumption and general trends in demand, IFREMER, December 1999.

Guillotreau P., Sékulic I., Mondialisation, effet de génération et demande de poissons frais en France , *Economies et Sociétés*, (à paraître).

Paquotte P., Le marché de la moule en France : évolution de l’offre et de la demande, VIIIèmes Rencontres interrégionales de l’AGLIA, 14-15 septembre 1995, in *Globefish*, volume 55, 1998.

Raynaud E., Creating a central party to manage a web of contracts: the case of franchising in the French milling industry, in *Vertical relationship and coordination in the food system,* Galizzi G. & Venturini L., eds. Contribution to economics, Heidelberg: Physica-Verlag, 597-609, 1999.

Sans P., Fonguyon (de) G., Différenciation des produits et segmentation de la viande bovine en France, *Cahiers d'Economie et Sociologie Rurales, 50,* 55-76, 1999.

SECODIP, La consommation des produits de la mer, Rapports annuels, 1983 – 1999.