



Instituto Universitario de Estudios Marítimos

<http://www.udc.es/iuem>

The tuna industry: production and trade

Fernando González Laxe

Ramón Núñez Gamallo

Summary: This paper analyses the current situation of the world tuna market, which supplies the principal raw material used by the canned fish industry. The European tuna industry has several weaknesses such as its fragmented business structure or its enormous competition in the consumer markets. However, it should take advantage of the assets it does have, for example the high level of technology and know-how of its work force, and also the opportunities offered by the globalisation process in the supplying of raw materials.

Key words: International trade (JEL F14, Q27); canned tuna (JEL L66); Tuna fish (JEL Q22); spatial localization of the tuna canning activity. (JEL R12)

Introduction

The aim of this paper is to analyse the current situation of the world tuna market, supplying the principal raw material used by the canned fish industry. Tuna is the third most popularly consumed sea product in the world, behind only shrimp and the so-called bottom fish species. In addition, it is the only species that is exploited, produced, and processed on a large scale.

In the context of the current economic globalisation, the growth and the interdependence of the markets stimulate trade, direct investment, and the new organizational and managerial formulas of the companies. Relevant changes in consumer habits and demand combine with technological advances and the different fishing availabilities, elements which have important consequences in-so-far as the commercial tendencies and the accesses to the resources are concerned. Publications such as those of Josupeit (2004a,b) analyse distinct expansion and localization dynamics, and emphasize the most difficult problems related to them. Other studies, such as Oceanic Development, Poseidon Aquatic Resource Management Ltd., and Megapesca Lda. (2005), analyse the impact of the latest trade liberalizations on the European tuna sector, establishing a series of possible scenarios where it is shown how the influence of the non-protection of the sector will have negative consequences not only in reference to the volume of business of the relevant companies but also in the level of employment in the zones or regions where the degree of liberalization is at its highest. The European industry has a certain leeway because of a series of favourable factors such as the increase in demand of tuna products in Europe or more favourable conjunctural situations than the current one - a lower price for energy - for example. However, the principal problem lies in the limitation of the resources, which is more important than an increase in the pressure in the production process as new producing countries enter to compete in the market.

The study consists of the following sections: in the first section, the dependence level of the inputs that the tuna industry presents will be estimated. In the second section, an analysis of the international markets with regard to the raw material and the transformed products, and the influence of the commercial barriers will be realized. In the third section, the dimension and infrastructure of the companies, the development of the new brands and new products, and the fragility of the transportation and logistic networks will be discussed. In the current global economy, it is necessary to analyse the relocation processes by means of the direct investment tendencies of the companies in the sector and the existence of contracts with

external providers for supplying, and this is presented in the fourth section. In the final section, the results and conclusions of this work are presented.

1. Estimation of the dependence level of the inputs

The essential input of the canned tuna fish industry is obviously, tuna. This raw material can arrive at between 30 and 40% of the average consumption in the industry, followed by metallic products with about 20%, the oils and fats with about 6%, and the packaging and packing materials with much less importance, as can be deduced from sector studies carried out by means of the I-O tables, (García Negro,2003). Although normal price fluctuations can affect all the inputs necessary in the production process, we cannot consider it to be dependence, at least in the cases of the industrialized countries, because it is not foreseeable that bottlenecks in their offers will occur due to the great number of suppliers that offer a series of alternatives for supplying the canned tuna industry.

However, the input which provides the name to the industry, the tuna fish, is indeed subject to a series of events that provoke a marked dependence of the industry with respect to its behaviour in the world markets, such as the abundance of resources, its accessibility, among others. Next, we will talk in detail about the problem of tuna as raw material for the canned tuna fish industry.

Species.

Among the captured species, the skipjack tuna with about half of the captures followed by the yellowfin tuna with about 25% are the ones principally used in the canning industry. The principal tuna species with respect to their economic worth are the Albacore tuna (Thunnus Alalunga, Albacore, ALB); the Bigeye tuna (Thunnus Obesus, Bigeye, BET); the Yellowfin tuna (Thunnus Albacares, Yellowfin, YFT); the Skipjack tuna (Katsuwonus, Skipjack, SJK); the Atlantic Bluefin tuna (Thunnus thynnus, atlantic bluefin; BFT); the Pacific Bluefin tuna (Thunnus Orientalis, Pacific Bluefin, PBF) and the Southern Bluefin tuna (Thunnus macoyii, Southern Bluefin, SBF).

Captures.

As demonstrated by various authors such as Leiva Moreno and Majkowski (2004), Josupeit (2006,2004b), Catarci (2004), Miyake (2003,2004), the tuna captures have experienced a

rapid growth since the 50s, increasing from half a million tons to the current amount of more than 4 million tons. The Pacific Ocean represents the highest number of captures (65%), with a significant increase in the last few years. In the Atlantic Ocean (14%), the captures are fewer and the number has remained constant since the 90s. On the contrary, the captures in the Indian Ocean (21%) have greatly increased since the 80s, and is now in second position. This pattern of captures demonstrates the possibility that in the Atlantic Ocean the stock of striped tuna is close to overexploitation. The stock of yellowfin tuna is a state of sustainable exploitation, in terms of both the captures and the fishing activity. On the other hand, the bigeye tuna is nearing a state of overexploitation. Because of that, the ICCAT (International Commission for the Conservation of the Atlantic Tuna) recommends maintaining the moratorium on fishing with Fish Aggregating Devices (FAD).

In the Indian Ocean, there are no significant problems with the skipjack tuna stock, but we have to take into account that the growth rate of captures is very elevated, which can become problematic in the future. The stocks of yellow-fin and big-eye tuna are already close to the maximum level of full exploitation. In the Pacific Ocean, there are no particular problems with the skipjack tuna stock, but the bigeye and yellowfin tuna have already reached full exploitation.

In summary, although there do not seem to be any important problems with the skipjack tuna, the stock of bigeye and yellowfin tuna need prudent management because we are in a situation which does not permit an increase in captures. This situation has an important impact on the tuna fishing boat fleet, especially seiners, which despite being mainly used for the skipjack tuna are also involved in secondary captures of other species. The situation is different for albacore tuna, whose stocks do not show any worrisome signs, although it is recommended not to increase the fishing activity in order not to end up in a condition of overexploitation. On the other hand, the situation seems to be quite complicated for the bluefin tuna species, whose state of overexploitation is obvious, meaning that it is necessary to reduce the captures and fortify the activity of fattening them up in cages.

The captures of all species present a distinct seasonalness, depending on the species and the latitude; since, in general, from July to September the fish approach the coast to spawn and then return to deeper waters starting in November. On the other hand, the captures of tropical tuna are more irregular. In general, these involve species that have a great mobility,

covering great distances in their journeys, meaning that it is difficult and expensive to use fishing boats. This important factor of seasonality provokes pronounced price fluctuations during the year.

Table 1. Captures of the different commercial species of tuna, in metric tons

Ocean	Species	2000	2001	2002	2003	2004
Atlantic Ocean	Albacore	66 720	69 357	61 037	60 940	52 211
	Atlantic bluefin	36 251	36 399	35 588	32 209	31 577
	Bigeye	106 985	100 899	79 302	85 631	72 112
	Skipjack	139 545	152 998	117 924	149 033	159 806
	Southern bluefin	2 336	2 517	1 358	2 291	1 171
	Yellowfin	129 682	156 907	137 469	121 593	114 356
Total Atlantic Ocean and adjacent areas		634 940	672 434	578 482	596 879	567 817
Indian Ocean	Albacore	25 309	18 470	19 613	22 910	20 102
	Bigeye	140 473	125 904	133 728	120 797	115 609
	Skipjack	407 557	413 201	466 529	447 464	428 454
	Southern bluefin	11 362	12 644	11 710	8 902	12 540
	Yellowfin	316 214	302 332	323 566	432 954	481 494
Total Indian Ocean and adjacent areas		1 399 268	1 320 060	1 429 690	1 517 344	1 508 770
Pacific Ocean	Albacore	123 230	143 073	157 287	138 300	143 448
	Bigeye	189 387	187 656	232 830	204 901	217 616
	Pacific bluefin	16 185	9 143	9 095	9 736	12 189
	Skipjack	1 409 588	1 257 339	1 426 434	1 580 459	1 504 096
	Southern bluefin	1 530	2 136	2 172	2 334	1 777
	Yellowfin	738 917	875 388	884 960	903 961	788 508
Total Pacific Ocean and adjacent areas		3 750 128	3 744 929	4 100 642	4 133 793	3 948 033
Total general		5 784 336	5 737 423	6 108 814	6 248 016	6 024 620
Source: Elaborated from FAO data						

Fishing and fleet equipment

Haul seines carry out more than half of the captures. According to the study realized by Oceanic Development, Poseidon Aquatic Resource Management Ltd. and Megapesca Lda. (2005), the type of fleet that predominates in all the oceans is the seiner, which is responsible for capturing about 60% of the tuna. The seiners controlled by European (French and Spanish) companies represent 20% of world fleet. The data concerning boats with boulders and fishing lines are not complete and there is noticeable activity on the part of INN boats (so-called Illegal, Non-declared, Non-regulated Fishing), resulting in a definite threat to the management of the stocks and causing occasional prominent distortions in the market.

Main countries

Currently, the main countries involved in the capture of the various tuna species are the United States, Japan, Taiwan, Spain, Indonesia, the Philippines, Korea, France, Mexico, and Venezuela. Japan is the world leader in captures with 18%, followed by the European Union (France, Spain, Italy, and Portugal with 13%. French and Spanish boats realize 90% of the European Union's tuna captures, which are skipjack and yellowfin.

Aquaculture

Aquaculture is practiced almost exclusively for the bluefin tuna, which is the species with the highest rate of overexploitation. The reproduction technique is still not completely developed, and instead is concentrating on fattening up captured tuna in captivity. The tuna is transferred from haul seines to transport cages, and are then kept in breeding areas where they are fattened up for their posterior sale. This production is devoted to sashimi in Japan where a higher price can be obtained.

Price fluctuations

The price of tuna experiences strong variations during the year due to the seasonal variations of the captures, the speculative actions of the canners, and the effects of currency exchange. Referring to Mercamadrid data for the year 2006 (from January to September), the difference between the lowest prices and the highest prices correspond to a variation of almost 75% (from 4.39 to 7.67 €/kg for fresh bonito – albacore (a difference of 59% for 2005) and in the case of fresh tuna, we can find the same pattern but with an even bigger variation (differences of 110% for 2006 and 99.7% for 2005). The months with the lowest prices are from July to October and the highest prices are in April and May in the case of fresh bonito.

This behaviour means that in order to improve the profitability of the exploitations, the strategies of the producers are inclined towards increasing the captures, which supposes a greater pressure on the resource and contributes to increase the problems of overexploitation. A similar situation occurs with the transforming industry, which tries to overcome this difficulty by increasing the production as much as possible. This provokes fierce competition and a general decrease in the prices of the products.

Production of tuna as raw material and in canning

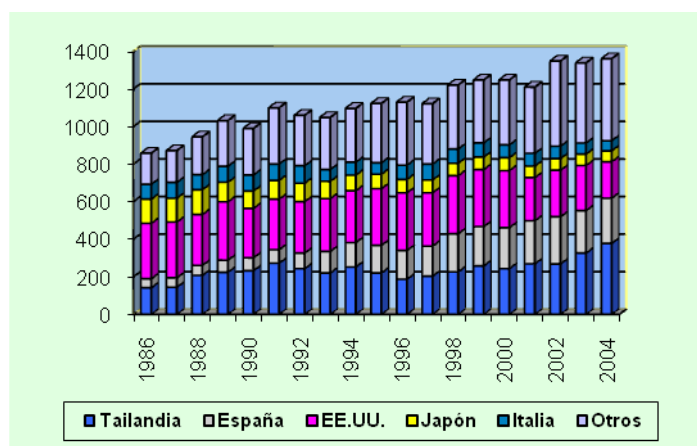
Despite being involved with a worldwide market, the tuna industry has a series of peculiarities due to, in some cases, the dominant position of the big companies, and in other cases, to the different consumption habits of the three biggest markets: Japan, the U.S.A., and the European Union.

Three principal factors explain the diversification in production carried out since the 70s: a) the adoption of the Exclusive Economic Zone (EEZ) to 200 miles for the majority of the coastal countries; b) the easing of customs restrictions as agreed to under the auspices of the GATT (now WTO), which favours the circulation of tuna as raw material and in a lesser degree as canning; and c) the signing of the Lomé agreements between the EU and the ACP countries.

Due to the confluence of these factors, a real world tuna production decentralization has been produced because of the increased number of countries with tuna fishing fleets. In any case, Japan continues to be the first producer, followed by Taiwan, Indonesia, and Spain.

Moreover, the transformation sector has responded to this dynamic by relocating tuna canning factories from their original locations in consumer countries to overseas territories or developing countries, resulting in two economic benefits: the low labour cost and proximity to the most productive fishing areas.

Figure 1. Production of canned tuna, thousands of tons



Source: Josupeit (2006)

As a consequence of the increase in the number of countries involved in fishing operations, the world supply of tuna experienced a big increase resulting in a significant reduction in price. With the entry of new producers into the market the increase in the supply incited falling prices and in this way, the profit margins were reduced and the competition increased, which caused the disappearance of some companies and forced others to undergo expansion or to merge in order to survive and recover margins.

At the end of the 70s, two new sites of the transformation industry were established: Southeast Asia and South America. This growth process re-emerged again in the beginning of the 90s, when there was a second surge of investments, this time with Africa as the destination, as a result of the growth of captures of the European fleet in the Indian Ocean and the development of the Ghanian fleet in the Atlantic Ocean.

However, the canning and transforming industries in general have not undergone a strong decentralization process such as what has happened with the captures. The ten leading producing countries total more than 80% of the world's production. The increase of producing countries is due to the continuously growing capacity of a reduced number of multi-national companies. The big canned tuna production sites are, on one hand, also big tuna consumption areas, such as Europe, Japan, and the United States, and, on the other hand, also large exportation sites to other areas of consumption (Southeast Asia, the ACP countries, or the countries forming part of the GSP-Drugs agreement).

In the EU, the principal producers are Spain and France, which have experienced a strong growth since the 70s, especially in the tuna/raw material sector, and to a lesser extent in the canning industry, where it is more equally divided among all the countries of the EU.

2. Analysis of the raw material and transformed products international market

Having analysed the availability of the resource, we turn now to study the international circulation of raw materials and finished products. The two biggest destinations of the tuna captures are direct consumption and canning.

Direct consumption.

Tuna for direct consumption is generally considered to be a luxury item which can attain very high prices. This type of tuna is imported by developed countries, especially Japan, where it is consumed fresh, principally as sashimi, although there are other specialties such as fushi, which is smoked skipjack tuna, and tataki, which is raw skipjack tuna roasted on the outside. In other developed countries, tuna is consumed either fresh or frozen, principally in fillets.

For direct consumption, five species of tuna are principally used: big-eye, yellow-fin, Atlantic blue-fin, Southern blue-fin, and Pacific blue-fin. Tuna captures for direct consumption have increased about 70% since the 80s. Major part of the European production of North Atlantic and Mediterranean blue-fin is destined for Japan for the production of sashimi. In contrast, a sharp increase in the direct consumption of albacore tuna is expected in Europe.

In the European Union, fresh tuna is principally imported from Yemen, Morocco, Senegal, and Turkey. The main destination is Spain (50% of the imports) followed by Italy (33%). The European Community market, which is mainly concentrated in big urban centres, has experienced a continuous growth in yellow-fin, blue-fin, and albacore tuna.

Transformed products

More than 70% of the tuna captured is destined for canning, and the production is realized principally from raw fish. The species most utilized for canning are: skipjack, yellow-fin, and albacore. Skipjack is the one used the most and also the cheapest; yellow-fin is better quality and more expensive; and albacore is most expensive and has an important demand in the United States, France, and Spain.

Principal producers are Thailand, Spain, and the United States. The industry is dominated by five large multi-national groups: Bolton, Bumble Bee, JohnWest/Heinz, Starkist, and Thai Union. On a second level, we can find the Spanish, Calvo, Jealsa, FRINSA, Isabel and

Albacora; the French, Paul Paulet, Saupiquet and Connetable; the Italians, RioMare, Nostrodomo, Palmera, Mareblu, Star, and Maruzella; and the English, John West and Princes. In the European Union, principal producers of canned tuna are Spain, Italy, and France. Production industry is using greater and greater quantities of fish backs coming from Ecuador, Venezuela, or Costa Rica, which allows for a reduction in the exploitation costs for the factories. Spanish canning companies are present in Galicia, South America (Chile, Brazil, Venezuela, and Ecuador), and Central America (Honduras and El Salvador). The production of tuna in France is mainly for tuna salads, with the fish backs coming from Thailand, Italy, or Ecuador, while the traditional products are manufactured in Africa or in the islands of the Indian Ocean. Tuna is captured by a European fleet and transformed by the canners in the Seychelles, the Ivory Coast, Mauritius, and Madagascar. Spanish canners still work with frozen tuna, which is transported by refrigerator ships.

In Spain, at the moment, the domestic transformation is predominantly contrary to the delocalisation of the canneries. Therefore, the tuna exports of the Spanish fleet are limited with respect to the imports. However, the Spanish industry has been internationalised with businesses in Latin and Central America, the result of direct investment processes or the acquisitions of already existent factories.

In the Americas, the principal producers are the United States and Mexico. The Samoan canneries produce almost all of the of the United States' canned tuna. In addition, the American canneries are being set up in other countries such as Ecuador and Thailand. In Asia, canned tuna production is concentrated in Thailand, Japan, the Philippines, Iran, and Indonesia. The Thai industry is oriented towards exportation. The canneries are either small or medium-sized companies, except for those of the Thai group.

Prices and international tendencies

As far as international production and trade is concerned, the principal canned tuna producers in terms of world production in 2001, as shown by Cararci (2004), were Thailand, with 19.3%; the United States, with 16.5%; and Spain, with 16.4%. Moreover, the principal world importers are the United States, the United Kingdom, and France. Thailand is the number one world exporter, followed by Spain and Ecuador.

Tuna imports have increased much more in terms of value than in terms of quantity. Prices have increased substantially, although since the 90s, they have stabilized due to the behaviour of the Japanese imports and the crisis of the Thai canning industry. The prices, therefore, have experienced ascents and descents since the 80s, and are higher in Europe than in North America.

Spain became the third largest producer of canned tuna in the world in the 90s. The concentration of the industry in only a few companies has resulted in an improvement in efficiency. In addition, it is the second leading exporter.

In the last few years, there has been a reduction in canned tuna production in the industrialized countries due to labour costs (Josupeit, 2004b). The recent investments by European countries in various Central American and South American countries have resulted in increases in the production in those countries, causing changes in the situation of the canned tuna production plants. This behaviour is noted by Catarci (2004), who observes that during the years 1989-2001, an internationalisation of the European canning industry was produced along with a progressive integration with the industry of the African, Caribbean, and Pacific (ACP) countries.

Principal exporters of tuna as raw material for the canning industry are Taiwan, Spain, and France. As far as the European exports are concerned, they are principally destined for the transformation procedures located in Africa and South America.

Thailand is the leading importer of tuna as raw material; Japan is in second place, followed by Spain, the Seychelles, the Ivory Coast, the Philippines, the United States, and Italy. The European imports of frozen tuna are marked by a strong increase in demand in Spain (86% of the European imports). These imports come from the Dutch Antilles and Panama (flags of convenience) and the GSP countries (Venezuela and Guatemala). The intra-community supplying of Spain and Italy comes almost exclusively from France, while the supplying of Portugal and France comes almost exclusively from Spain.

As far as canned tuna exports from Spain are concerned, the principal advantage is the quality / price relationship. The most important destination is the European Union, which represents approximately 77% of the value of the products commercialised outside of our country.

European imports of fish backs are increasing in importance, and they are destined for the countries that produce canned tuna such as Italy, Spain, France, and Portugal. Their importance has doubled in ten years and they are more and more utilized as raw material in the canning industry. The fish backs come from GSP countries, South America, Thailand, and Kenya.

The principal exporters of canned and prepared tuna products in the world after Thailand are Ecuador, Spain, the Philippines, Indonesia, the Ivory Coast, the Seychelles, Ghana, and Mauritius. The United States, France, Italy, Germany, and Spain are their importers.

The European market is the most important one for canned tuna (40% of the supplies). All the destination markets of the European imports, except for France, show tendencies that are on the rise. 56% of the canned tuna products come from ACP countries, 29% from Southeast Asia, and 12% from GSP countries. The intra-community interchange has multiplied by a factor of four in ten years. Spain has become the principal supplier of Italy, the United Kingdom, and Portugal. The degree of openness of the European frozen tuna industry is high: the exportation index during the last three years has been situated between 0.54 and 0.71 and the penetration index between 0.52 and 0.69, which translates into a high degree of internationalisation. From the point of view of competitiveness, the suppliers of canned tuna from the European market, the Seychelles, Ecuador, and Spain are in a good position.

When realizing the analysis of the importation unitary values of the aggregate flows, intra as well as extra-community, we proceed by distinguishing the different categories of tuna imported products: tuna for direct consumption, tuna fillets, tuna as raw material for the transformation industry, tuna backs, and finally canned tuna. We use the importation unitary values as an approximation variable of the importation prices of the products. The analysis is realized from the importation data supplied by Comext, and following the identification of the attributive positions of the Combined Nomenclature to 8 digits, we also consider the EU-25.

Tables 2 and 3 illustrate to us the unitary value of the intra-community imports for direct consumption, and the imports that come from non-community areas. In general, the community prices are higher than those of the rest of the world. When dealing with products for direct human consumption, we are talking about the production of quality fish, principally meant for domestic consumption and the restaurant / hotel business. However, even in this

area, the competition of the extra-community production, with prices that are significantly inferior, result in, despite a reduced margin, the majority of the imports being extra-community.

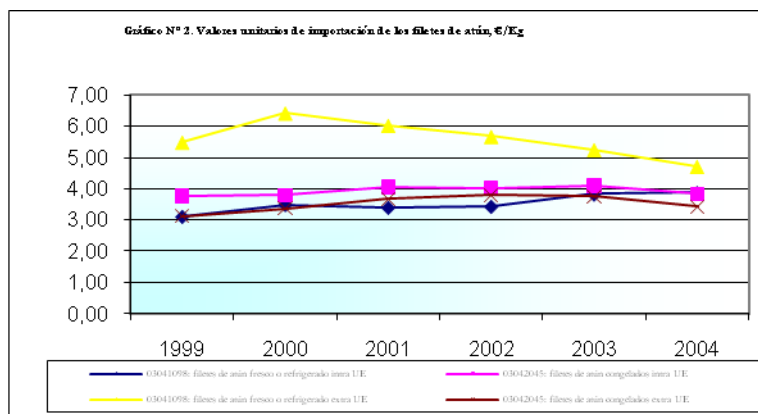
Table 2. Intra-community tuna imports for direct consumption. Unitary values €/kg.						
Tariff position	1999	2000	2001	2002	2003	2004
03023190	2.43	2.98	3.08	4.01	3.31	3.87
03023290	0.68	2.59	4.00	4.57	4.92	5.25
03023390	3.01	4.43	2.54	2.79	3.82	4.09
03023490	--	--	--	6.28	4.64	4.16
03023590	--	--	--	4.70	6.13	4.84
03023690	--	--	--	5.61	7.65	5.28
03023990	--	--	--	3.97	4.17	4.32
03034190	2.25	3.36	4.58	3.97	2.59	2.91
03034290	1.42	1.53	2.60	2.69	2.16	2.18
03034390	0.71	0.98	0.83	0.58	0.71	0.79
03034490	--	--	--	1.67	1.26	1.17
03034590	--	--	--	6.85	4.69	3.39
03034690	--	--	--	3.43	3.50	3.16
03034980	--	--	--	2.13	1.61	1.56

Source: Elaboration by Comext

Table 3. Extra-community tuna imports for direct consumption Unitary values €/kg.						
Tariff position	1999	2000	2001	2002	2003	2004
03023190	3.37	3.26	4.22	4.07	2.98	3.45
03023290	4.19	4.46	4.59	4.40	4.13	3.60
03023390	1.23	1.38	1.53	1.42	1.58	1.77
03023490	--	--	--	4.74	4.41	5.22
03023590	--	--	--	4.34	4.45	4.50
03023690	--	--	--	4.21	4.37	--
03023990	--	--	--	4.35	4.91	4.06
03034190	1.30	1.44	1.87	1.59	1.66	1.91
03034290	1.09	0.78	1.11	1.21	1.05	1.04
03034390	0.71	0.52	0.84	0.90	0.64	0.79
03034490	--	--	--	1.19	1.01	0.99
03034590	--	--	--	1.37	2.23	1.86
03034690	--	--	--	2.23	--	--
03034980	--	--	--	1.08	0.83	0.90

Source: Elaboration by Comext

With reference to tuna fillets, Table 2 shows a certain price stability, between 3 and 4 €/Kg., starting in 1999, except for extra-EU imports of fresh or refrigerated tuna fillets. These imports, however, present a convergent tendency towards the average intra-community price. Moreover, we should also indicate that this is a segment of the market whose total European imports barely reached 55 million euros in 2004, divided almost equally between intra and extra-community distribution.



Source: Elaborated by Comext

Tariff positions	1999	2000	2001	2002	2003	2004
03023110	2.57	3.22	3.52	3.00	1.60	1.94
03023210	1.83	1.45	1.36	1.52	1.30	1.26
03023310	4.87	1.22	1.02	3.99	2.99	2.29
03023410	--	--	--	4.27	4.84	6.52
03023510	--	--	--	6.37	4.01	4.56
03023610	--	--	--	5.85	1.60	5.00
03023910	--	--	--	6.02	3.94	3.17
03034111	1.00	2.01	1.92	1.82	0.91	1.96
03034113	2.77	1.98	2.95	3.18	2.93	3.31
03034119	4.56	1.20	3.93	3.71	3.92	4.80
03034212	1.19	1.11	1.26	1.46	1.19	1.11
03034232	3.08	2.66	2.57	3.01	3.63	2.65
03034258	3.10	4.22	2.98	3.31	5.62	4.48
03034311	0.68	0.70	0.86	1.01	0.82	0.81
03034313	1.36	3.29	0.32	0.28	--	3.67
03034319	2.55	2.31	2.55	2.63	3.06	2.69
03034411	--	--	--	1.03	0.92	1.01
03034413	--	--	--	--	2.06	3.13
03034511	--	--	--	3.74	3.18	1.61
03034513	--	--	--	2.26	2.38	4.06
03034519	--	--	--	2.94	2.20	5.07
03034611	--	--	--	3.52	3.48	--
03034619	--	--	--	3.20	--	--
03034931	--	--	--	0.96	2.11	0.89
03034933	--	--	--	1.81	2.10	1.56
03034939	--	--	--	1.87	0.45	0.64

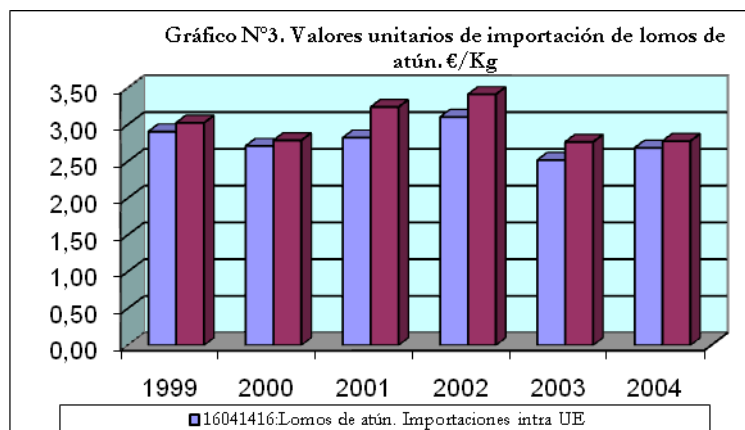
Source: Elaborated by Comext.

Table 5. Extra-community imports of transformed tuna products for industry						
Unitary values €/Kg.						
Tariff positions	1999	2000	2001	2002	2003	2004
03023110	4.85	--	--	--	1.81	7.86
03023210	0.94	3.39	--	--	1.11	--
03023410	--	--	--	--	--	5.92
03023510	--	--	--	6.98	--	--
03023610	--	--	--	--	--	6.43
03034111	1.60	2.29	2.27	2.01	1.65	1.69
03034113	--	2.42	--	1.38	--	1.44
03034119	0.95	--	2.35	--	1.10	1.75
03034212	1.13	1.08	1.22	1.27	1.15	1.06
03034232	1.47	1.06	1.35	--	1.13	1.03
03034258	1.33	3.00	2.44	3.98	1.14	1.54
03034311	0.64	0.56	0.92	0.88	0.65	0.78
03034313	0.84	--	--	0.95	--	--
03034319	1.05	--	--	--	--	--
03034411	--	--	--	1.11	0.93	0.84
03034419	--	--	--	--	--	1.81
03034511	--	--	--	1.35	1.31	2.13
03034513	--	--	--	--	1.50	1.80
03034519	--	--	--	--	--	0.76
03034611	--	--	--	--	0.86	--
03034931	--	--	--	1.10	0.97	0.78
03034933	--	--	--	1.99	1.64	2.75

Source: Elaborated by Comext.

A different situation appears when looking at the segment of products transformed from tuna raw material. Here, the number of tariff positions is considerable, and, in addition, we are dealing with imports that in 2004 reached 117 million euros, predominating intra-community imports and in general, presenting high average prices, as can be seen in the previous Tables.

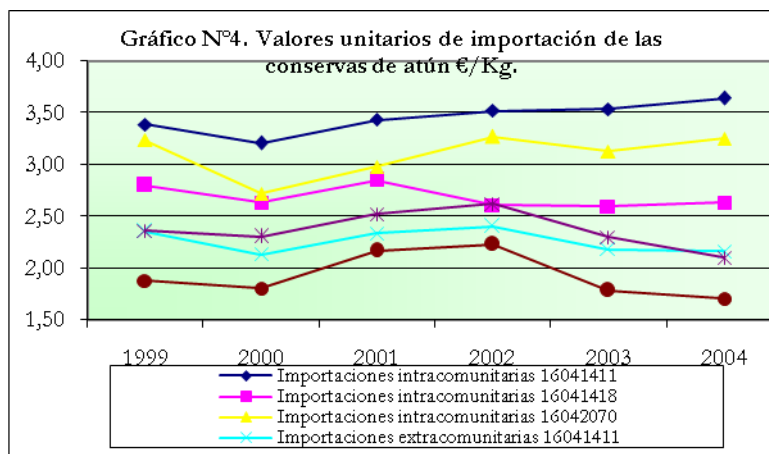
We find ourselves in a different situation when we analyse the tuna back imports, which is becoming more and more important as input for the tuna industry and is very closely tied to the processes of international expansion of the companies and relocation of the production plants. The prices of the extra-community imports are normally higher than the intra-community prices. In addition, the major share of the imports, representing more than 90% of the 2004 total, come from extra-community areas, which accounted for a total value of 180 million euros as compared to the barely 18 million euros of intra-community imports for that year.



Source: Elaborated by Comext

Finally, we arrive at the analysis of the community imports of canned tuna and their prices. The first thing we must point out is that, by a wide margin, it is the most important sector of the tuna-related exterior trade, considering that in 2004 the community imports of canned tuna reached the amount of 1,252,000,000 euros, with 60% of the supplies coming from outside of the EU. This situation is consistent with the already described situation of the tuna backs, although, we must now consider, apart from the internationalisation strategy of the European canning industry, the strong competition from producers from other economic areas, especially Southeast Asia.

Thus, for the three categories of canned tuna considered - albacore, yellow-fin, and skipjack - the average extra-community import prices are noticeably lower, arriving at prices which are a little more than half the prices achieved by the intra-community imports. If we assume that one of the most important parts of the intra-community imports is constituted of community production, while the extra-community imports is constituted of foreign production, we therefore find ourselves in one of the weak points of the European canning industry: the difficulty to compete, in terms of prices, with the production of the rest of the world.



Source: Elaborated by Comext

Tariffs

The regulation of the international trade of tuna products manifests the fact that the countries which are the biggest producers of canned tuna protect their own industry in two ways. In the first place, they facilitate the supply by promoting the free circulation of frozen tropical tuna, and in the second place, they obstruct the entry into their market of imported canned tuna by means of the creation of tariff barriers. We shall now look at the situation in each of the three principal destination markets.

In the European Union, the tuna imports are subjected to tariffs, the quantity depending on the degree of transformation: on one hand, non-existent for raw material destined for transformation, but, on the other hand, quite high for fish backs and for canned tuna. Specifically, a tariff of 22% is applied to EU tuna imports for direct consumption, 15% for fresh fillets, 18% for frozen fillets, and 24% for fish backs and canned tuna.

There exist a certain number of exemptions in the framework of favoured nations: unilateral arrangements such as for the GSP countries or the Cotonou agreement for the ACP countries (with no tariffs); and the “Everything But Arms” (EBA) agreement. The exemptions are subject to strict origin clauses.

In the United States, all the fresh, refrigerated, and frozen tuna benefit from a zero tariff. With respect to tuna backs, the tariff is 35% for those of more than 6.8 kg and 6% for smaller ones. In addition, there is no tariff for fish coming from a GSP country. Tuna preserved in oil (including tuna in a bag) is subject to a tariff of 35%, with an exemption for less advanced

countries benefiting from a zero tariff. Other types of preserved tuna (for example, in a natural way) can have a tariff of 6% for a quota equivalent to up to 4.8% of the preserved tuna consumption in the United States of the previous year. If this quota is surpassed, the applicable tariff is 12.5%, except for less advanced countries benefiting from a zero tariff. With respect to bagged tuna, it should be noted that for weights inferior to 6.8 kg tuna imported from the countries that benefit from the Andean Trade Preference– Drug Eradication Act (ATPDEA) do not pay any tariff if the tuna raw material was captured by either a fleet of the United States or one of the beneficiary countries and the bagged tuna was transformed in a beneficiary country.

In the case of Japan, for all the fresh, refrigerated, or frozen tuna, after applying the WTO tariff of 3.5%, the total tariff is 5%. All preserved tuna and fushi are imported with a general tariff of 9.6%. However, developing countries that benefit from GSP export preserved skipjack at a tariff of 7.2% and the other preserved tuna at 6.4%. The less developed countries can export without paying a tariff.

Technical, sanitary, and environmental regulations

They constitute the body of principal regulations that affect the commercial flows and which we can refer to as “other non-tariff barriers to trade.” Tuna and canned tuna as alimentary products are subject to different technical and sanitary regulations. Thus, the product labelling must provide obligatory and concrete information in order to facilitate the trace-ability of the products and not lead to consumer error. In addition, labelling that indicates that the product is environmentally friendly must fulfil certain relevant norms.

In the case of the European Union, the companies which sell fish products have to be authorized by a specifically granted sanitary approval that is based on the recognition of the authorities responsible for controlling this particular area as well as the existence of a Hazard Analysis and Critical Point (HACCP) system that identifies the risks during the production stages. These risks, in the case of canned tuna, principally refer to the presence of histamines, heavy metals, and botulinal toxins.

Among the principal technical regulations, we find that the labelling must inform the consumer about the product. This information is marked by different laws which are obligatory in the EU for fresh consumer products. Canned tuna fish and its packaging are

regulated in different ways in the EU. In the United States, there is also a defined standard for canned tuna that takes into account a series of organoleptic criteria (colour, odour, texture, etc.). Similarly, the packaging is also regulated in this market.

With respect to sanitary regulations, the principal ones refer to veterinary and sanitary controls; the application of the HACCP system; histamine control; vigilance over the presence of heavy metals; and vigilance over, and control, of the additives and colourings used.

The EU also employs the principal of third country recognition, which establishes that imported products are ones that fulfil certain conditions of control and hygiene which are “at least equivalent to” the ones of the EU.

The trace-ability, which consists of the “possibility of finding and following the trail of a food product, animal feed, or the animal itself that either meant for or having the possibility for the production of or the incorporation into a food item or animal feed during all the production, transformation, and distribution stages”. What we are concerned with in the case of Europe is the “Tuna Tracking System”.

In the United States, there are also control requirements with reference to low acidity cooked items, especially ones undergoing thermal treatment or sterilization. To this issue, we have to add the concern for methylmercury: it is recommended that young children and women who are either pregnant or at a child bearing age not consume more than 6 ounces of canned albacore tuna per week. Lastly, in the context of the 2002 American “bio-terrorism act,” the FDA maintains a registry of suppliers.

Finally, as far as environmental labelling is concerned, there is a formula which permits the product to have a distinct logo or declaration which offers guarantees to the consumers that the product in question has been produced according to a set of American standards, such as, for example, the sustainability of the resource used as raw material, the production method’s environmental impact, or the recycle-ability of the product’s packaging.

As a particular example of environmental labelling, we can cite the “dolphin safe” labelling in the United States, which affects the tuna captured in the central-eastern Pacific Ocean, where the dolphins mix with yellow-fin tuna shoals without any apparent reason for doing so. In

general, because of the complexity of some of these regulations concerning environmental labelling, they can be utilized as a trade barrier, and, in other cases, they can cause a significant increase in production costs, which affect the competitiveness of the product.

3. Analysis of the size and infrastructures of the companies

We are going to refer to the transformation industry, which includes, apart from classic tuna canning, the manufacturing of tuna backs and other more valuable preparations. First, we should point out that the transformation industry creates fewer induced jobs than the fishing industry because there is only a direct relationship with the manufacturing of containers and packaging, and the transport. The employment ratio for the transformation industry is one indirect employee for each direct one, while in the fishing industry, it is 1.5 to 1.

Spain represents 65% of the European Union tuna fish activity, particularly in the transformation industry. This translates into 15,000 jobs, the majority of which are in Galicia, directly and indirectly related to tuna fish activities. On one hand, this type of production is profoundly affected by the impact of free trade, and, on the other hand, the progressive incorporation of technical innovations has caused this industry to become very dynamic and more and more oriented towards external markets.

The canning industry is facing an important modernization of the plants and the production processes, as well as a process of concentration in order to achieve the ideal size to enable it to compete on an international level. Because of these processes, as well as the specialisation of the products, the market share for the companies, in terms of both volume and value, has been changing in the last few years.

The lack of sufficient size of the companies, where atomisation is the norm, provokes important limitations in the development of the sector, being affected in terms of the supplying of raw materials, their quality controls, the optimum utilization of the installations, access to formation and information, the suitable development of the logistics networks, a greater development in terms of trade and brand policies, research into new products and processes, and the incorporation of innovation in the production processes. Normally, the companies' investment strategy is conditioned by their need to be close to supply centres of raw materials, as well as needing important distribution networks available to take their products to where the demand is greatest, which for the most part is in large population areas.

The development of brands and new product

In reference to big markets and trade integration processes, we find ourselves in a globalised and competitive sector in which the products have to compete, not only in traditional economic terms (price and quality), but also in other relevant aspects such as health, the environment, and even politics. In these conditions, according to Munchlk (2006), “the strengthening of the relationship between producers and consumers is necessary, not only to establish specific trade channels, but also to improve the competence of those involved in affecting the purchasing decisions of the consumers.”

With this situation in mind, it has become necessary to develop products and brands and have a marketing plan which incorporates identity symbols which are easily identifiable by the consumers as a means of differentiation. As again pointed out by Munchlk (2006), these features can take various distinct aspects into consideration: the place, the scenery, the history of the product, the language, and the skill of the producers.

Moreover, thanks to the concept of quality, the products can obtain another means of differentiation, allowing for an increase in the profit margin. However, this type of product differentiation strategy results in additional costs for the company in the areas of research, publicity, distribution channels, etc.

The quality of the products supports the mechanism of increase of reputation of the companies. In other words, the design of a brand's image based on an association with the quality of the product generates an image of a self-regulated commitment towards the consumer. However, this control and maintenance of a product's quality obliges the company to reinforce them in an ongoing way by means of the certification devices of ex ante controls (accreditation) and ex post controls (verification).

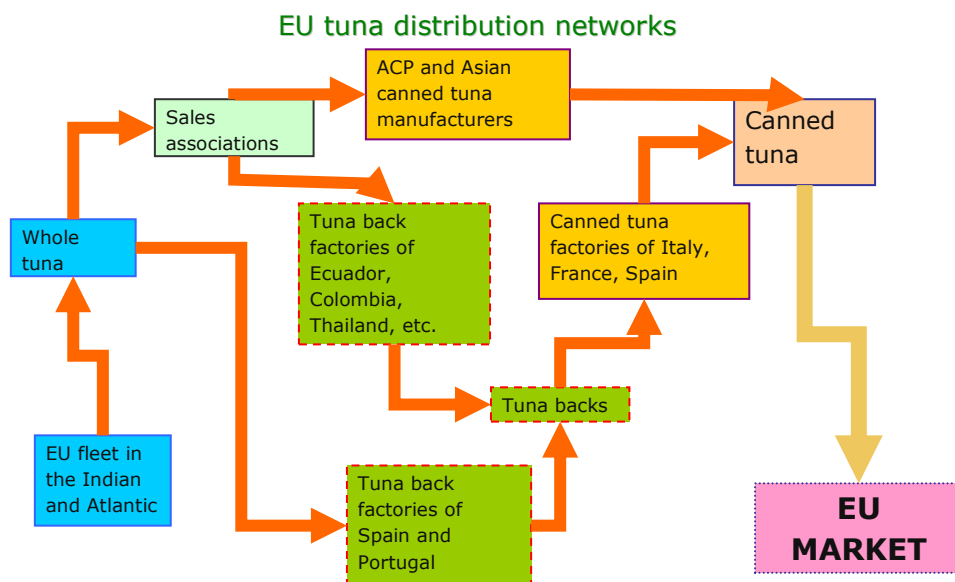
Thus, the evaluation of the products will be defined by the following characteristics: a) the methods and techniques which are used highlight the identification as a distinctive trait that marks the specificity of the product; b) the quality of a product's origin, the fishing zone or area, specifically denominated; c) the production process, which bestows qualities that are different from other productions; and d) the ex post product selection, its follow-up and verification.

From the point of view of the producer, it is more realistic in the majority of cases to construct a strategy based on complementariness rather than antagonism, with the objective of finding specific niches in the market. The producer's challenge is not so much the problem of competing against industrial products from large companies, but rather in knowing how to use these products as a guide to identifying its own production.

Fragility of the transport and logistics networks

Other important issues related to the canned tuna industry are in reference to the supply networks and the distribution channels of the finished products. The European tuna distribution networks are shown in the following diagram:

Diagram 5



Source: Oceanic Development, Poseidon Aquatic Resource Management Ltd. and Megapesca Lda. (2005)

The European Community fleets realize their captures principally in the Indian and Atlantic Oceans. One part of these captures are distributed via sales associations to tuna back production plants in developing countries and canned tuna factories in ACP and Asian countries. The other part of these captures go directly to Spanish and Portuguese tuna back factories.

The canned tuna that supplies the European market comes partially form the production of ACP and Asian countries (generally from European owned plants) and partially from canned

tuna factories situated in European territory, which also are more and more involved with the supplying of tuna backs.

Generally speaking, despite having made many accomplishments, the canned tuna industry should consider the following recommendations: a) Improve the presentation and treatment of the product; b) Provide the correct identification of the product along with its characteristics; c) Guarantee the highest level in sanitary and hygienic controls; d) Ensure there are proper installations; e) Develop an adequate number of sales centres in order to obtain the best prices and to facilitate the logistics; f) Dedicate more resources in the transformation of the product, because the consumers are more and more interested in products that are not only new, but also more elaborate and sophisticated. This requires more intensity in the work process, but it also generates increased value; g) Create commercialisation services on one's own or in partnership; h) Strengthen the development of the system of sales via Internet; i) Increase the culture and formation of the economic management concepts (González-Laxe, 2006).

We should point out two factors having enormous interest and relevance: In the first place, the enormous concentration of the industry in a certain geographical area resulting in the necessity of having adequate infrastructure equipment and transportation networks in order to guarantee the connection with international markets, and in the second place, the big distribution chains are exercising more and more influence in terms of the products reaching the consumers, which gives them a solid bargaining position with the producers.

The distribution companies have been gradually increasing in size during the last ten years resulting in a process of concentration and diversification. This concentration gives the commercial distribution the ability to orient the demand, and, therefore, the power to condition the production strategies of both the primary production and the transformation industries.

We should take into account that a change is being produced in the distribution channels of the American market (Burney, 2006). Thus, the large supermarkets are becoming more and more important while the smaller traditional neighbourhood shops are losing influence. Moreover, the purchases of canned tuna are being realized when doing the bulk of the general shopping (once or twice a month). These data can be easily transferable to the situation in Europe, where 80% of the canned tuna is being sold and distributed by hypermarkets and

supermarkets (Wieland, 2006). In addition, these large distributors, especially in the countries of northern Europe, have developed the so-called “private brands” and they can place a big part of the production in their shops at lower prices, resulting in a very concentrated demand. Burney (2006) explains these changes in the American market in terms of the following key factors: a) demographic changes; b) access to information on the part of the consumers; c) greater concern for health and nutritional aspects; d) the value placed on time (in purchasing and cooking); and e) a return to traditional family values, etc.

This high concentration of demand contrasts with the great fragmentation we find on the side of the offer, especially that of canned tuna. This asymmetry puts the producers of elaborated tuna products in a relatively poor position insofar as the negotiation processes on the markets are concerned.

4. Analysis of the relocation processes: direct investment flows and supply contracts with external providers

Once the supply and distribution channels in Europe of tuna elaborated products have been analysed, it is easy to see the high level of internationalisation which exists in the sector. Among the principal causes which may force a canned tuna company to relocate or expand to other geographical areas we find, in the first place, the obstacle of the high costs of the raw materials, and in second place, the costs of the personnel. Another important factor is the relative ease of access to the raw materials, especially with regard to fishing, given the restrictions that this activity is subjected to, and also the greater availability of this resource in the countries being invested in because of the high degree of overexploitation of the resources managed in developed countries. Moreover, there is no difficulty with these products as far as transportation and conservation are concerned (Núñez Gamallo, 2006).

However, the conditions under which a new production plant is established or a pre-existing one is acquired are not only the ones directly related to with the company's costs, but we also must be aware of questions such as political stability, the presence of consolidated and reliable institutions in order to avoid the strangling of the productive activity, the quantity and quality of the human capital, and a reasonable tax structure.

Thus, the lower cost of the workforce, even though it is an important factor, is usually over-estimated given that companies do not automatically move to certain locations just because the salaries are lower, but instead the work marketplace of the destination location has to be characterized by its flexibility and the qualification of its workers in terms of experience and ability. In addition, salaries usually become determined by productivity. Therefore, it is not sufficient to just consider lower salaries; these need to be complemented by work productivity. In summary, it is essential to take into account the binomial salaries – productivity.

In the case of the canned tuna industry, the growth trend and expansion into new markets, together with the need for a larger amount of primary input both induces and drives current processes of relocating businesses, as they look for proximity of resources and new customers.

The canning industry has witnessed the modernisation of factories and an intense process of concentration in order to meet the demands of competing on an international level in terms of dimensions and size. The development of quality brands and, indeed, “white brands” may be a deciding factor when moving production sites for lower-cost produce to other more economical areas. Moreover, the sector’s ability to compete will depend on its ability to generate new produce, new trade strategies, distribution methods and having greater global vision regarding markets, given that international competition is extremely fierce.

As a point in case, Calvo’s production plant in El Salvador is a clear example of productive delocalisation as a business strategy, combining a variety of motivating factors: cost-cutting in the workforce in this Central American country compared to existing costs in Spain; greater access to the world market and the North American market for this type of produce; exploiting natural conditions and pre-existing infrastructures; and finally, access to primary material.

5. Conclusions and recommendations

The regional tuna industry finds itself in a situation where there is fierce competition in international markets and labour costs are a key issue. For example, in Europe labour costs are 20 times greater than in Asia, not to mention China, and the ratio is similar in Latin America. Likewise, the sharp rise in petrol prices has created difficulties for the fishing fleet, as it is the primary operational cost, representing more than 30% of the final product cost.

This situation shows the extent to which tax, logistical and access to primary resources, among other aspects that have an impact on production costs of businesses, are becoming increasingly relevant. The current business situation of the sector does not allow for an optimum exploitation of possibilities due to its characterising features: a limited trade framework; the lack of any consolidated strategy in terms of differentiating products, the employment of a traditional strategy for competitive prices, including predominant “white brands”, and until recently, limited investment capacity. Added to this is the strong heterogeneity of this industry and the limitations presented by lack of access to primary materials.

This is a highly vulnerable sector in terms of what is involved in globalization of the markets; mainly increasing competitiveness, not only from similar products, but also because of the increase in the wide range of products available to consumers. In this respect this sector is one which is particularly prone to relocation processes, due to the fact that it is very fragmented. This generally leads to lower productivity, limited added value in production, scarce innovative capacity, high staffing costs for an unskilled workforce, as well as limited access to primary materials to a great extent.

This performance has to be examined within the context of the world tuna market, where there has been a marked increase in the amount caught over the last few decades, especially in the Pacific. The greatest registered quantities are yellowfin tuna and skipjack tuna, as these are the most widely used species in the canning industry. However, the increase in quantities caught means that there is a high risk of overexploitation of resources. For this reason, the enforcement of measures to prevent or alleviate the situation has been recommended. The main market for these products lies in industrialized countries, which have the strongest economies. In addition, the sector has witnessed a visible shift in demand for these products, as consumers prefer products with higher added value, which have been prepared for or adapted to occidental lifestyles.

The performance of the main species of tuna in the canning industry displays symptoms of excessive offer, which is directly related to an excess in productive capacity and a situation bordering on the overexploitation of resources.

Moreover, the influence of large chain stores, and the final prices for consumers that these set, has a relevant impact on distribution networks, giving them greater power when negotiating with production companies. As a result, production companies are in a weak position in terms of developing new products carefully designed to adapt to new consumer tastes, which would involve further development of culinary specialties with tuna as the main ingredient.

Lastly, in terms of transport networks and logistics, it is important to emphasise the following points: on the one hand there is an enormous concentration of industry in a specific geographical area, which means that transport networks depend on the excessive development of infrastructures in the aforementioned area. On the other hand, the influence of the large distribution chains in bringing the product to consumers gives them greater negotiating power over production companies.

This WTSO analysis has been adapted to examine the performance of trends in trade as previously outlined, according to Valsecchi (2006).

As stated in the Third International Tuna Conference, which took place in Vigo (November 2006), “the Galician tuna industry is currently under a great amount of pressure in terms of tax, labour costs, health and safety measures, instability of access to primary material etc, making competitive prices for products difficult compared to those countries which have very low production costs and easy access to primary material, such as South East Asia”.

The response of the Galician tuna industry has been to specialise in niches in the market with high added value. However, the weakness of this strategy lies in the fact that the market targets the average-high income consumer, meaning less volume purchased, which could mean a reduction in European productive capacity.

Increased development in international trade and its wider diversification, not only in terms of the variety of products, but also countries involved in exchanges, together with the trend towards dismantling protective trade barriers, will have significant repercussions for the whole industry irrespective of their location. The long awaited increase in the flow of trade will increase competitive pressure and will provide favourable conditions for the consumer. However, issues such as health concerns, environmental matters, and conditions in the labour market of production countries may become more important than comparatively low retail prices. Undeniably, this last combination of factors could also be regarded as a threat to the European industry, which will have to make a marked effort to adapt to all kinds of regulations geared towards sustainable development and the maintenance and conservation of resources.

Figure 6. WTSO analysis of tuna production and the canning industry

<p>Strengths:</p> <ul style="list-style-type: none"> • Strong, competitive workforce. • High level of competitive transport service in Europe. • High level of technical skill, know-how and the competent organisation of businesses in the tuna industry with leading European companies. 	<p>Weaknesses:</p> <ul style="list-style-type: none"> • Irregularity in supplies of primary materials, causing marked fluctuations in price. • Lack of competitiveness of local suppliers of secondary primary materials. • The use of traditional facilities, the result of which is traditional products.
<p>Opportunities:</p> <ul style="list-style-type: none"> • Stop additional reductions of rights to production for Asian countries in the regional market. • Achieve stability in tuna supplies at competitive costs. • Shift from the basic process of tuna steaks to more sophisticated products 	<p>Threats:</p> <ul style="list-style-type: none"> • Removal of commercial restrictions in Europe. • Marked increases in European labour costs. • Toughening up of environmental regulations.

Regarding technology, know-how, information, administration etc. the European industry has a comparatively clear advantage: the EU exports production technology, organization and the development of new products etc. At this level, the canned tuna industry has great prospects in terms of continuing to be competitive, not only on the single market but on the world market too.

REFERENCES

- BURNEY, D. (2006). The U.S. Market for Canned Tuna..ANFACO, III Conferencia Mundial del Atun. Vigo.
- CATARCI, C. (2004). The World Tuna Industry. An analysis of imports and prices, and their combined impact on catches and tuna fishing capacity. FAO, Fisheries Department.
- GARCÍA NEGRO, M^a.C. (2003). Táboas input – output pesca – conserva galegas 1999.
- GONZÁLEZ LAXE, F. (2006): “Rasgos y estrategias del sector pesquero gallego”. En Alvaro Garrido (coord.). As pescas en Portugal. Universidade de Coimbra.
- JOSUPEIT H. (2004,a). Analysis of markets and consumers trends, FAO, abril.
- JOSUPEIT H. (2004,b). Global World Tuna Markets. FAO. INFOFISH, Tuna Conference, 3-5, june Bangkok.
- JOSUPEIT H.(2005,c). La producción y el mercado de las conservas y semiconservas de pescados y mariscos. FAO.
- JOSUPEIT H. (2006). Situación actual y perspectivas futuras de la transformación y comercialización del atún desde la perspectiva transnacional. ANFACO, III Conferencia Mundial del Atún, Vigo.
- LEIVA MORENO & MAJKOWSKI (2004). Status of tuna stocks. 17 Meeting of the Standing Committee on Tuna and Billfish. Majura, Mashall Islands.
- MIYAKE (2004). Brief view of the world tuna fisheries. Status of tuna stocks. 17 Meeting of the Standing Committee on Tuna and Billfish. Majura, Mashall Islands.
- NÚÑEZ GAMALLO, R. (2006). “Las empresas conserveras y el mercado mundial del atún”. Revista Galega de Economía, junio, año/vol. 15, número 1. Universidad de Santiago de Compostela, Santiago de Compostela, España.
- OCEANIC DÉVELOPPMENT, POSEIDON AQUATIC RESOURCE MANAGEMENT LTD. Y MEGAPESCA LDA. (2005). Estudio de la rama atunera europea. Comisión Europea.
- SCHMIDT (2004). Globalisation, industry structure, markets power and impacts on the fish trade opportunities and challenges for development. OCDE.
- VALSECCHI (2006). Ponencia en la III Conferencia Mundial del Atún, ANFACO, Vigo.
- WIELAND (2006). The European single market: A new scene for tuna, Consumption possibilities and challenges, III Conferencia Mundial del Atún