

THE FISH CANNING SECTOR IN SPAIN: GALICIA, VIGO ESTUARY, 1900-2003

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Abstract

This study analyses how the Spanish fish canning sector is principally located in Galicia, specifically in Vigo Estuary. Its origin is investigated and the main features of the canning sector are studied. The conclusion is that during the first decade of the 20th century there was a consolidation of a productive structure composed of small companies specialised in fish canning and concentrated in Vigo estuary. This concentration and specialisation was maintained throughout the rest of the century and continues with force in the 21st.

Keywords: Canning industry, Spain.

JEL: R10, L66

1. Introduction

The canning industry produces food using the method of sterilization in hermetically sealed containers, a procedure called *apertisation* in honour of its inventor Nicolas Appert. The development of a canning industry in Europe begins timidly in the early 19th century, manufacturing without scientific knowledge on the food preservation process until 1872, year in which Pasteur proved microbial sterilization scientifically. France was the cradle of the canning industry, achieving great development from the mid 19th century: twenty-five fish canning factories were in operation in 1849, one hundred in 1870 and a hundred and seventy in 1880¹. Production followed the same progress, as can be seen in table 1.

This expansion was not limited to France but spread to the rest of Europe. The process was described by Massó (1964: 4): in France the Caraud-Amieux factory was founded in 1852 followed by Tertrais in 1853, Luis Levesque was established in 1854 and Joseph Penau in 1855, from then on, growth accelerated with the creation of the company Cassegrain in 1856, followed by others in London, Frankfurt and Scotland. The current canning giants of the canning industry arose in North America, such as Libby McNeill in 1868, Campbell Soup in 1869, California Packing, H.J. Heinz and Julius Wolf in 1876. In Spain, the canning industry began in the mid 19th century, located in different coastal enclaves in Galicia. The chronological order of this industrial development is the following: Caamaño in Noya (1850), Alvargonzalo in Asturias (1859), Víctor y Agustín Curbera in Vigo (1861), Juan Goday in Arosa Estuary (1879) and Massó en Bueu (1883). Massó was established in Bueu to manufacture canned sardines in the Nantes style with the collaboration of French technicians and industrialists.

In 1885, the *Revista de Pesca Marítima* (Maritime Fishing Magazine) (1885: 186) informed that a new fish canning industry –located in Vigo estuary– was developing quickly: In the last few years, food canning, especially sardines in oil, has acquired extraordinary development in Vigo estuary, it is enough to say that last year two new

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¹ The development of French industry can be consulted in Decroix J. L. (1964).

factories opened, one of which produced, in just nine months, six hundred thousand cans weighing one hundred and fifty thousand kilograms, with all the obstacles that a new industry has to overcome. The information provided by the *Libros Copiadores de Cartas Comerciales* (Commercial Letter Copy Books) in Massó enables us to affirm that the factory that produced six hundred thousand cans in the first six months of operation was Massó. Studying the *Libros de Sociedades* (Companies Books) of the Mercantile Register of Pontevedra has revealed that the six canning factories opened were the following: Alonso e Hijos, Víctor Curbera and Benigno Barreras in Vigo; Massó y Compañía in Bueu; José Goday and Dumas Vilaret in the Island of Arosa. The first two, in addition to sardines in oil, also canned other fish, meat and poultry. The last two produced canned fish, mostly sardines, and Massó and Barreras just sardines.

Table 1. Fish canning factories in France

Year	No. of factories	No. of cans produced
1849	25	1.000.000
1854	55	10.000.000
1870	100	
1880	170	80.000.000
1886	106	

Source: Drawn up from Abreu (1983).

The process of expansion of the canning industry in Vigo was to continue during the following decade. A Report by the *Junta de Obras del Puerto de Vigo* (Vigo Harbour Works Board) makes reference to this, stating that in 1898, the fish canning industry was already composed of twelve factories, some of which had an annual maximum production of around fifteen thousand crates, with a total value of about three million pesetas, the value of the premises and machinery was about seven hundred thousand pesetas, which added to the stocks and funds invested, amounted to a capital of two million pesetas.

To study the canning industry in Vigo, a quantitative methodology, researching into the sources of information containing figures, combined with a qualitative methodology based on other types of study has been used. For the quantitative part, the *Estadísticas de Comercio de España 1888-1940* (Spanish Trade Statistics) was used. The qualitative part is the result of information provided by the *Libros de Sociedades* (Company Books) of the Mercantile Register of Pontevedra, the Archives of the canning industries, the *Revista de Pesca Marítima* (Maritime Fishing Magazine), Municipal Minutes from the Town Hall of Vigo, reports made by the *Junta de Obras del Puerto de Vigo* (Vigo Harbour Works Board) and the official minutes of the Employer's association *Unión de Fabricantes de Conservas de Vigo* (Union of Canning Manufacturers of Vigo). The information provided from these sources enables us to reconstruct the process of establishment and consolidation of the fish canning industry in Vigo estuary. For this purpose, the work has been divided into five parts. After the first introductory part, the second part studies the relationship between the establishment of this industry and export of production. Section three deals with the problems for importing tinsplate, in the context of Spanish economic protectionism at the time. Part four refers to the development of the canning industry in the different economic scenarios. Finally, section five contains the principal conclusions.

2. Foreign market

The fish canning industry's production is destined to foreign markets and thus the sector was configured as an exporter from the very beginning. It also depended on foreign sources for tinplate, the fundamental raw material, which is imported from England. These foreign trade relations condition both the origin and development of the canning sector. The intense export activity of the canning industry in Vigo can be seen by the fact that the Customs House of Vigo occupies the second national position by amount of canned fish exported –only surpassed by Santander- at the end of the 19th century. From the beginning of the 20th century, the Customs House of Vigo will occupy the first position in export of canned fish (Table 2).

Table 2. Export of canned sardines products through the Customs House of Vigo 1888-1906 (thousand of kg.)

Year	Vigo Canned sardines	Santander Canned	Spain Canned
1888	990	1800	4.671
1889	980	2218	5513
1890	1400	3000	6176
1891	1400	2600	5894
1892	1800	3200	7068
1893	2000	3200	8502
1894	1400	4487	8550
1895	2000	2700	8614
1896	1800	3320	9369
1897	2000	2106	10200
1898	2000	2700	11926
1899	2500	2200	10758
1900	1800	1860	11537
1901	2200	1803	13016
1902	3700	1941	15592
1903	5300	1883	19883
1904	6000	1586	19684
1905	9500	1200	23704
1906	10600	1460	26286

Source: Abreu (1983) drawn up from Spanish foreign trade statistics.

The significant increase of exports is a result of the establishment and expansion of the canning industry in Vigo during the first decade of the 20th century. Once this position was consolidated, it was maintained. Consequently, it can be said that the canning industry of Galicia is located in Vigo estuary. Exports of production were mainly to France and Cuba at the end of the 19th century. At the beginning of the 20th century, Cuba is replaced by Argentina, and Italy and Germany are added to France and Argentina as principal recipients of the canning production (Table 3). The abundant exports to France can be explained by a crisis, at the end of the 19th century, in fishing activities that supplied the French canning industry. A low level of captures and the consequences of this are discussed in the *Memoria presentada a la Junta Consultiva de Pesca Francesa*² (Report presented to the French Fishing Advisory Board). This report refers to the relation between the crisis of the French fishing sector and export of canned fish from Vigo. It indicates that catches in France reached a figure of one thousand million sardines

² The Report comes from the *Revista de Pesca Marítima* of the year 1888, pp. 273 and following.

in 1875. This figure was doubled in 1878 and 1879 but fell drastically in subsequent years. As a result, France had no option –both to supply its domestic and its export market-, but to import canned fish from Spain and Portugal. French import figures to supply their market illustrate the situation (Table 4). It can be said that the French canning crisis was one of the factors that encouraged the establishment of the canning sector in Vigo.

Table 3. Destination of Spanish exports of canned sardines (thousand of kg.)

Year	France	Cuba	México	Argentina	Germany	England	Italy
1890	1050	2600	667	300	132	185	41
1895	1900	3200	496	300	114	618	52
1900	1900		1000	900		2300	687
1910	3700	700	145	3500	900	700	860
1915	6000	900	58	1400		550	432
1920	1900	2200	800	2500	155	8	1601
1925	400	300	200	1400	551	90	637
1930	3700	300	400	4200	1375	190	3691
1940		33	30	15		450	3553

Source: Drawn up from Spanish foreign trade statistics.

As already mentioned, this crisis implies that French production was not able to cover the demands of their domestic and foreign markets. France was dominant in the foreign canning market (this was not by chance, as France was the country where the inventor of this technique was born) and the difficulties to supply them explain why the imports of canned sardines in *transit* increased. The figures in table 4 show the high level of French import of sardines in transit for re-exporting. These figures indicate that Spanish and Portuguese canned products were commercialised and re-exported to other countries by French businesses.

Table 4. French imports of canned sardines

Year	Sardine captures (millions)	Imports for the domestic market (kg.)	Imports in transit: for re-exporting (kg.)
1869		9.000	
1875	1.000		
1878	2.000		
1879	2.000		
1881	300	1.000.000	
1884	400		
1885			2.000.000
1886		2.000.000	2.000.000
1887			2.000.000

Source: Drawn up from *Revista de Pesca Marítima* 1888.

The creation and development of Spanish and Portuguese canning industries have their origin in the facts mentioned above. The French secretary general of fishery in the Report (1888: 275) states this, affirming that the Spanish canning industry is in constant growth from the moment the Spanish and Portuguese were initiated in our manufacturing secrets, and we set the foundations for the first factories in these foreign lands. While the French canning sector suffers from a lack of sardine catches, the situation of the canning industry in Vigo is excellent. This situation is described by the French consuls –in the *Revista de Pesca Marítima* (1888: 279)- when they state that fishing has been good in Vigo, the average catch per ship being six thousand sardines per day, and as there are two thousand ships dedicated to this, prices are no longer established by the thousand but

rather by baskets of three thousand sardines, these baskets are sold for ten to thirteen francs, very low prices compared to France.

The impoverishment of the coastline causes a crisis in the French canning sector and leads to the closure of canning factories. At the beginning of 1880 there were 157 factories, by 1886 only 106 remained. This crisis continues in the following years, now as a result of the competition offered by the rapid consolidation of the Spanish canning industry. This situation makes the export trade to France difficult, as it is obliged to make up for insufficiency in domestic production with Spanish imports. The loyalty of the French domestic market to their canned products and the demand for French canned products abroad caused a peculiar type of export of canned products from Vigo destined to France. This export is the result of a demand for Spanish canned products as long as *they could be sold as French*. Demand for unmarked cans that could be sold as if they were French explained the export of Spanish cans *without designation of origin*, or in some cases bearing the inscription at the bottom of the label: *fabrique au bord du mer* –a question that arose continuously in the documentation of the time.

As a result of the above, canning production from Vigo is exported without designation of origin and is labelled as French on reaching its destination in France. It seems logical to think that a large part of the profit obtained from the Spanish product ended up in the hands of the French intermediaries who sold the cans with their own brands without mentioning their real Spanish origin. Canning production in Vigo was exclusively for export, but the manufacturers in Vigo had no control over foreign markets and lacked sufficient commercialisation networks to distribute their products abroad.

The issue of designation of origin was difficult to remedy. European consumers were clearly loyal to French products and the French intermediaries, in order to supply their markets, could not do without Spanish production. Spanish canned products could only obtain acknowledgement of their quality –even though this was something they clearly had from the beginning- slowly, so as to be able to export mentioning their origin. This export without Spanish designation of origin continued until 1905, year in which the French government established that cans imported into France must indicate their place of origin. In view of this measure, the Galician canning industries request a postponement in order to sell the production already canned according to the old regulations. The French government accepts this request and grants a deferment before applying the Law and consequently up to 31 October 1905 it was possible to import in France canned fish packaged according to the old regulations, i.e., without indicating their origin. At the end of this period, cans of fish or any other product that could be similar to French products should indicate the fact that they were imported and specify their real origin with the text: *Importé d'Espagne*³.

The resolution taken by the French government favoured canning production in Vigo. So much so that the Employer's Association *Unión de Fabricantes de Conserva de Vigo* agrees in 1906 to forbid export through Spanish ports or borders of cans manufactured in Spain that are not marked with the country of origin and the manufacturer's name, extending the measure taken by the French government to the rest of countries that imported Spanish canned fish. Nevertheless, during the first decades of the 20th century, companies in Vigo still included French references on their cans such as: "*Soleil de*

³ For the manufacturers of canned products, in *Revista de Economía y Hacienda*, year 1905, p. 886.

Nice”, “*Phare de la Liberté*”, “*Le Drapeau*” or “*fabrication médaillée et approuvée par la société D’Hygiène de France*”, so as to maintain the European market that was accustomed to French labelling.

Another problem affecting the sector is related to the supply of tinplate, raw material used for the containers, which was imported from England. The canning industry in Vigo had to bear the taxes imposed on imported tinplate in the context of a protectionist economic policy in Spain.

3. Importing raw materials

Ever since it began, the canning industry was confronted with successive obstacles to obtain tinplate for their containers, and the ease or difficulty in obtaining this raw material conditioned the development of the canning sector. Initially, the canning industry’s main problem was the *import tariffs* for tinplate and oil, basic raw materials for this industry. Since 1885 there had been complaints about high taxes on importing tinplate. Cuesta Crespo (1885: 359) stated that if the six factories in the province of Pontevedra had less taxation on oil and tinplate, enabling them to use the good oils of Nice and have cheap containers, they could compete advantageously with similar products in France and Portugal. Research carried out in Abreu (1983) showed how fish canning manufacturers used semi-mild tinplate imported from England. As already mentioned, the tinplate problem arises from the import taxes on this material, which affects their competitiveness in foreign markets. In view of this situation, fish canning producers in the Vigo estuary requested the elimination of these import taxes or a reform that would reduce them.

In 1887, the company Goitia y Compañía in Bilbao signed a contract with Siemens in London to manufacture tinplate in Vizcaya⁴. This fact (which could free the canning industry from its foreign dependence on supplies of tinplate) creates a strong *controversy* between the opposing interests of the *Galician canning industry and the tinplate manufacturing industry in Vizcaya*. This controversy becomes more intense from the Law 14 of April 1888, establishing a special regime for temporary admissions in Spain. This Law intended to favour Spanish industry, allowing import free of duties for goods destined for transformation or perfection by industrial means, as long as the final product is destined for export.

Manufacturers of canned products in Vigo request the application of the *Ley de admisiones temporales* (Temporary Admission Law) for tinplate, as it is the raw material for a product destined for export. Canning industries claim that, if the benefits of the Law were not applied to tinplate and tin, it would be difficult to compete with the Portuguese and French canning industry in foreign markets, as tinplate is under the Temporary Admission Law in France and Portugal.

The Spanish Finance Ministry decided that it was not possible to grant the requests regarding temporary admission of tinplate of the manufacturers of canned food in Vigo estuary. The decision was published in the *Gaceta* of 16 August 1890 refusing the petition of the canning manufacturers in these words: “To pass a resolution in the indicated fashion, the Minister has taken into account, with regard to the tinplate, that it is not perfected or transformed because it is used to make containers for canned food ...”.

⁴ Nueva industria española: fabricación de acero Siemens y de hoja de lata (*New Spanish industry: manufacturing of Siemens steel and tinplate*), in *Revista de Pesca Marítima*, year 1887, pp.64 and following.

In 1906, -with the import tax reforms –manufacturers of canned products in Vigo estuary again request the temporary admission for tinplate. The basic argument used to continue requesting *temporary admission* is that the tinplate is a raw material for the export canning industry, and therefore would benefit the canning industry more than it would harm the tinplate industry. Thus, the canning industry, free from import taxes, could compete advantageously in foreign markets with similar foreign products and the amounts exported would increase. Being an export industry, in the framework of a Spanish economic protectionist policy, there is no doubt that competitiveness abroad could only be maintained with measures reducing the import tax regime, and the request for *temporary admission of tinplate* (only for canned products destined for export) seems fair and economically necessary. Manufacturers of canned products in the *Revista de Economía y Hacienda* (1906: 363) state that they think that if our trade has to look abroad, it is necessary that within the protectionism we defend, temporary admissions, incentives or neutral zones are implemented to reduce the effects of the Import tax, as one must acknowledge that without these aids of the protective system, many industries would not be able to survive or extend their sphere of action outside the country.

The tinplate question arose in the 19th century with the temporary admission Law (1888) and it was resolved then in an unfavourable manner. In 1906, it was again restarted with the import tariff reform and it will continue until 1909, concluding with the favourable resolution of the Government at the request of the canning manufacturers. That year the *Real Orden del Ministerio de Hacienda* (Finance Ministry Royal Order) of 18 March 1909 resolves the request of the canning manufacturers who see their desire for temporary admission of English tinplate for preparing cans authorised.

4. Development of the canning sector

The canning industry had a precedent in the traditional drying and salting activities. These activities, however, were carried out all along the coast of Galicia and Vigo estuary was not especially important in comparison to other locations in Galicia such as la Puebla, Muros or Ribeira, which exported large amounts of salted fish in comparison to the fish that passed through the Customs House of Vigo. Table 5 shows that the exports of salted fish in Vigo represented only ten per cent of the Spanish total and small amounts compared with other Galician locations. However, it can be seen that salting in Vigo experienced a strong growth coinciding with the expansion of the canning industry in Vigo during the first decade of the 20th century.

Table 5. Export of salted and pressed sardines (thousands of kg.)

Years	Spain	Galicia	Vigo	Barcelona	Santander
1888-1892	28.590	13.400	2.800	2.600	
1893-1897	26.000	14.600	2.100	500	587
1898-1902	36.000	14.860	3.300		7.000
1903-1907	36.000	11.300	5.400		7.200
1908-1912	43.600	11.764	2.424		13.200
1913-1917	29.500	6.500	3.700	2.600	8.700
1918-1920	21.000	4.200	4.200	5.000	3.300

Source: Drawn up from Spanish foreign trade statistics.

As mentioned before, the establishment of canning factories began in the 1880's and caused a rapid increase of production and exports, the sector focusing exclusively on export. An analysis of Foreign Trade statistics, Company Records and Municipal Records

of Vigo lead to the conclusion that Vigo became the principal centre of the Spanish fish canning industry at the turn of the 19th to 20th century. As the cans were destined for export, the amounts exported become the best indicator of growth of production in the sector. These amounts make Vigo the first exporter of canned fish of all Spanish ports since the beginning of the 20th century (Table 6).

Table 6. Export of canned sardines and other fish 1907-1940

Year	Canned sardines Vigo	Canned sardines Spain	Other canned fish Vigo
1907	10.636	12.970	951
1908	11.321	17.100	55
1909	8.208	14.110	192
1910	8.959	15.000	236
1911	8.310	14.500	509
1912	9.398	16.700	555
1913	12.472	19.900	334
1914	6.783	11.400	162
1915	5.651	10.400	1.525
1916	8.395	14.000	1.042
1917	3.954	11.600	1.102
1918	3.546	8.000	1.153
1919	6.403	11.300	1.243
1920	8.029	10.900	2.904
1921-1923		25.730	
1924-1926		19.200	
1927-1929		35.800	
1930	9.691	18.000	9.275
1931	8.500	17.000	7.010
1932	8.242	16.500	5.176
1933	10.079	17.100	4.418
1934	11.820	20.400	2.294
1935	13.348	21.700	3.036
1936	12.000		2.000
1937	14.000		2.000
1938	6.000		1.000
1939	1.500		500
1940	3.500	5.700	500

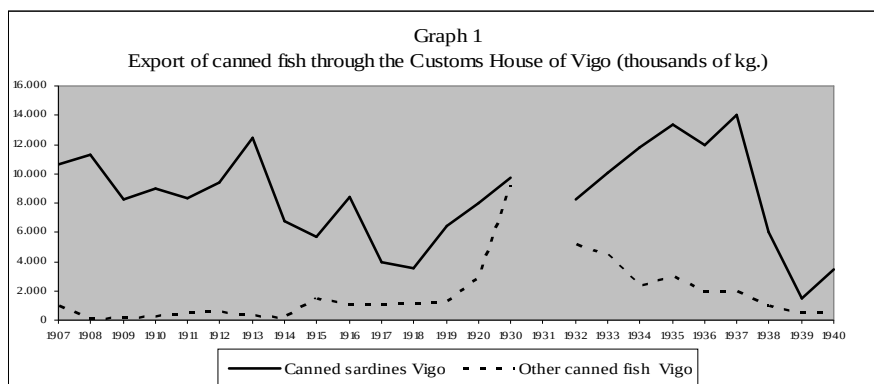
Source: Abreu (1983) drawn up from Spanish foreign trade statistics. Note: In Spanish foreign trade statistics for the 1921-1929 period, the products object of import and export, do not appear broken down by the Spanish customs houses but by the countries of destination or origin. From 1930, foreign trade is recorded by the Spanish customs houses. There are no foreign trade data for 1936-1937-1938 and in 1939 and 1940 the products are indicated by countries of origin or destination, therefore the figures corresponding to these years were obtained from the Report of the Harbour Works Board of the Port of Vigo. Insert in page 9.

Export of canned products through the customs house of Vigo is represented in graph 1. An analysis of the amounts exported confirms their significant increase during the first decade of the 20th century. Production and export of canned products increases from two million kilos in 1900 to ten million six years later. Therefore, we can affirm that the sector is consolidated in the first decade of the century and the canning industry of Vigo is definitively established. These high export figures continue in later years and fall notably during the First World War, at the end of the war; exports pick up again and in the 1930's surpass the export figures of the beginning of the century. This growth stops during the Spanish civil war.

Development of the canning industry at the beginning of the century can be seen in a Report prepared by the City Council of Vigo to determine the scope and importance of

fishing in the estuary. The report (*Revista de Pesca Marítima* 1901: 315-320) lists the number of canning and salting factories in the estuary in 1900. There were fifty-three salting factories and eighteen canning factories. The money invested in the 18 factories in Vigo estuary in 1900 amounted to three million pesetas, and annual production was estimated at three and a half million pesetas. Each factory in Vigo employed an average of 125 workers, totalling around 2.250 workers in the sector in 1900.

Other factories were built in successive years as well as enlargements of old installations. Foreign Trade statistics show the increase in canning production (Table 6 and graph 1) and information provided by Municipal Records shows the development of the canning industry during the first decade of the century, when new factories were established and old ones enlarged⁵.



Source: Table 6.

The establishment of the canning sector as an exporter during the first years of the century is indicative of the specialization in production for export. This specialization facilitates the implementation of technological innovations that are quickly applied by canning industries. Massó (1967: 37) refers to the principal novelties, which consisted of the replacement of manual welding with mechanical seaming, implementing Reinerts Norwegian seaming lever controlled machines that automated the closure of cans, the introduction of French circular welding machines that enabled the manufacture of “*decollage*” containers and the use of small Bliss presses for stamping. The introduction of these innovations increases productivity in the sector and is the basis for the consolidation of the canning industry in this stage. Abreu (1983: 241) explains how the application of innovations spreads to fishing and leads to the replacement of traditional boats such as the *jeito* with the *traíña* and the introduction of new fishing techniques and gear such as the purse seine and trawling, which increased fish captures. The introduction of innovations in the fishing vessels continued, and from 1902 coal-fired steam engines are adopted in fishing vessels as well as engines in small fishing boats. This process, which is consolidated in the first decade of the 20th century, will increase fishing catches for the canning industry.

The consolidation of the industry leads to an increase of canned exports and the growth of the sector. The development of the canning sector is materialised in the

⁵ Process investigated in Abreu (1983) and (2002). Also, Carmona (1994) studied the canning industry.

establishment of new factories in the first decade of the 20th century, which in turn increases production of canned products and exports.

In short, we could say that a notable concentration of small companies located in Vigo estuary and specialised in fish canning occurs during the first decade of the 20th century. This concentration and specialization will be the basis of the productive system of the estuary. In 1900 there were eighteen canning factories, increasing to forty-four in 1910. The 1911 Report of the Harbour Works Board of the Port of Vigo estimates that these 44 canning industries represent invested capital amounting to twelve million pesetas and annual production of fifteen million pesetas. This process was accompanied by an increase of invested capital (the average investment per factory is high), the reason being the need to enlarge and renew the installations, implementing technological innovations – mentioned above- in the productive process.

Table 7. Canning and salting factories in Vigo estuary in 1900 and 1910

	Year	No. of factories	Annual production (Pesetas.)	Capital invested (Pesetas.)
Canning	1900	18	3.500.000	3.000.000
Canning	1910	44	15.000.000	12.000.000
Salting	1900	53	140.000	1.000.000
Salting	1910	30	2.000.000	1.100.000

Source: Drawn up from Revista de Pesca Marítima 1901 and Report of the Harbour Works Board of Vigo 1911.

Foreign trade figures are the best indicator of production. These figures show that expansion of the canning sector in Vigo in the first years of the century was sustained by the production of canned sardines. From 1914, the canning sector in Vigo –producing only sardines- begins a process of industrial diversification. This process is confirmed by the production and export of other canned sea products, as can be seen in the table 6. This is a typical phenomenon in a mature industrial sector that tries to compensate for seasonal fluctuations in fishing and diversify its production by offering new products to the market.

The sector's consolidation leads to the foundation of the employer's association *Unión de Fabricantes de Conservas de la Ría de Vigo* (Union of Canning Manufacturers of Vigo Estuary) in 1904. This association of canning manufacturers is created to unite diverse efforts and activities of the manufacturers and it will have an important role in the defence of common interests, management of import tariff improvements and promotion of fish catches. In 1906, *La Unión* agrees to establish minimum sales prices with the association of canning industries in Setúbal –principal Portuguese canning centre. This agreement avoids Spanish and Portuguese canning industries competing in foreign markets.

Among the activities carried out by the *Unión de Fabricantes* during the first years of their foundation was holding assemblies between Galician and Portuguese manufacturers where agreements were reached to approach the Spanish and Portuguese governments aiming for the approval of a law obliging the indication of country and place of origin on the cans; agreement on the weight of each can, also indicating the name of the manufacturer, and to establish a minimum price, the same in both Spain and Portugal for lower class canned products.

Fourteen years after its foundation, the *Unión* entered a new stage, enlarging its scope of action to all manufacturers on the Galician coast, and in June 1918 it was no longer the

Unión de Fabricantes de la Ría de Vigo and became *Unión de Fabricantes de Conservas de Galicia* (Union of Canning Manufacturers of Galicia), developing an intense activity that continues today, currently called *Asociación Española de Fabricantes de Conservas de Pescado* (Spanish Association of Manufacturers of Canned Fish products).

In short, exports to France without designation of origin ended during the first decade of the 20th century, temporary admission of tinplate is applied, canning factories enlarge their installations and production considerably, incorporating technological improvements, and the business association of the sector is materialised with the foundation of the *Unión de Fabricantes*. Fact that lead me to the conclusion that the canning sector in Vigo is consolidated. Abreu (1983, 2002) explains how the canning industries create effects that advance the industry and establish horizontal relationships with other activities (auxiliary and general services) that are established in Vigo at the beginning of the century. Therefore, it can be said that the canning sector is the solid base on which the industrial district of Vigo estuary arises during the first decade of the 20th century.

In the following years, the canning sector will be influenced by different economic scenarios, both national and international: First World War, the inter-war period, Franco's regime, etc. These situations will logically have an influence on this exporting sector.

The period coinciding with the First World War affects the canning companies in Vigo, causing uncertainty in the sector and enormous harm to the businesses. Abreu (1983) refers to this when he states: many canning factories are not working because of the war, as French, German and Italian clients did not pay their debts with them under a moratorium, however, the canning industries of Vigo had to pay, resulting in an economic imbalance that was unstoppable. This imbalance would cause, in addition to the inevitable credit losses, many job losses, placing the canning industry in a critical situation due to the insecurity about the development of the war and the consequences it would have on this industry.

As a result of the war, production and export of canned products decline. The Work Inspector's Reports (1916: 117) about the influence of the European conflict on the industry in the province of Pontevedra in 1915 only mention the canning industry and its auxiliaries (wooden boxes and tinplate). These Reports state that sales of canned products are at high prices: the prices paid for them were unknown up to now in Spain...the extraordinary demand is reflected principally in the fact that certain markets, reluctant to consume lower classes of sardine, accept them today without complaint at all (canned sprat and mackerel). In other words, despite the reduction in export figures through the Customs House of Vigo, the war causes the demand to be willing to pay sharp increases in prices for canned products, -the same as for many other Spanish products, a situation researched in Spain by Roldán and García Delgado (1973).

The Work Inspectors' reports (1916: 118) show that the principal problem of the sector is the difficulty to obtain tinplate, due to the scarcity and high cost of this raw material. The price of tinplate rose by 90%, due to the fact that England was using it for manufacturing war munitions, which added to increased shipping costs, justified its high cost, as national production was insufficient to cover the needs of Spanish industry. As the First World War advances, the situation of the canning industry worsens. The war harms this exporting sector that no longer has steam shipping outlets to France, Italy and

England, and exports to South and Central America are restricted, places where most of the canning production of Vigo was destined, consequently, the war makes sending canned production to France, England, Italy, Philippines, Central America and the Pacific difficult and expensive.

As mentioned, a lack of tinplate and its high cost are the main problems of the canning industry. In view of this situation, a *Committee* is created in Spain in December 1917, to assign and distribute tinplate to the whole of the Spanish canning industry. Table 8 shows the tonnes allocated to each of the Spanish canning manufacturers in the specified year. This table shows the supremacy of the canning industry established in Vigo since the beginning of the century.

Table 8. Distribution of English tinplate made by the Committee in 1917,(in thousands of kg.)

Ría de Vigo	Riveira	Ría Arosa	Ayamonte	Haro, Santoña, Bermeo.
2.293	270	60	635	410

Source: Drawn up from Revista Industria Conservera (January-February 1954) p. 13.

When the situation went back to normal, the canning industry's activities are regularised. From 1920 new factories are made and existing factories are enlarged. However, the canning sector in Vigo will have to face a series of problems in the inter-war period: such as the implementation of new trade tariffs in Argentina, the generalization of new customs tariffs in Latin American countries and the competition of the USA and Portugal in foreign canning markets. In view of this situation, the Finance Ministry modified the Royal Order of 18 March 1909, which had granted the temporary admissions regime. The modification is established by Royal Order of the Ministry of 22 December 1924, and for this purpose, the Ministry takes into account: that the applicants base their requests, in a period of one year –for temporary admission of tinplate – in reality, it is excessively short, due to sales difficulties in foreign markets ...and the deadline these manufacturers have is modified, being two years from then on. In view of the situation of foreign markets, this measure facilitates and enlarges the conditions for tinplate procedures.

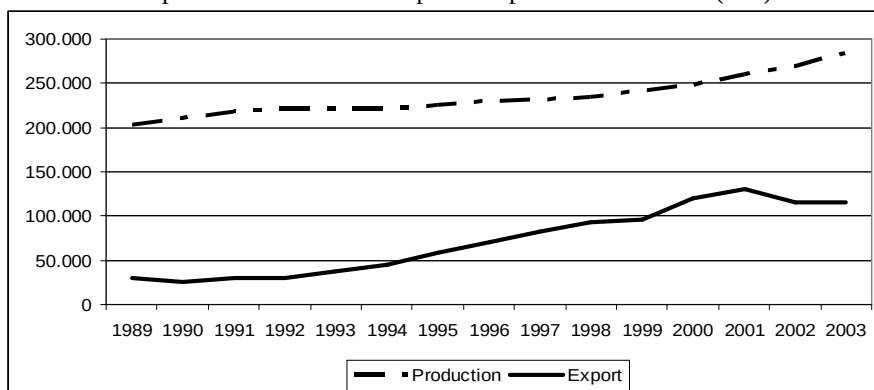
Once the aforementioned difficulties had been overcome, production and export increased. The 1930's begin with a large increase of the amounts exported through the Customs House of Vigo. These export figures exceed previous stages. 1930 is the peak of export for all the period being studied here. These data indicate the stability and competitiveness of the canning sector in Vigo. The main destinations for canned products are still Argentina, France and Italy. This new boost is accompanied by a restructuring of the sector, which initiates a process of industrial concentration, which can be seen in a progressive fall in the number of canning factories. The concentration process coincides with the establishment in Vigo of the first refrigeration companies. The increase of canning production and the amounts exported, as well as the process of recovery of foreign markets in the beginning of the 1930's will be cut short by the Civil War. The consequences of the economic policy of autarchy (self-sufficiency) implemented the first years of Franco's regime hurt the exporting canning industry, that suffers lethargy both in production and sales overseas.

The Stabilisation Plan of 1959 enables the opening and growth of Spanish economy in the 1960's; it not only facilitates the recovery of foreign markets, but also encourages the formation of an important interior market for canned products. In the seventies, the export

numbers recovered to the same values they had in the twenties. At the same time, a powerful fish freezing industry is also developed in Vigo estuary. This industry will ensure a continuous flow of fish to the canning industry, which will improve canning production stability and will encourage the introduction of technical improvements in the production process, especially automatic production line canning.

The modernization process of the canning factories and the integration of Spain in the U.E brought a significant increase (of a 300 percent in volume between 1989 and 2004) in the Galicia's preserved fish exports (graph 2). Tuna canning now becomes the leader, followed by sardine and mussel. Research on the Galician canning sector, such as that carried out by Amigo y Garza (2008) show the importance of the sector in the 21st century, when they explain –using the data from the FAO- how Galicia is the principal Spanish producer of canned fish today, as, at the European level, Spain occupies the top position, with approximately 50% of the EU-15 production in 2005 and Galicia has 80% of the Spanish canning production.

Graph 2. Production and export of Spanish canned fish (MT)



Source: Drawn up from J. Vieites (2005) p. 139.

Note: Galicia has 80% of the Spanish canning production and exports.

The canning sector established at the end of the 19th century is part of the industrial marine complex of Galicia in the 21st century.

5. Conclusions

The origin of industrialization in the Estuary is established by canning companies. Fish canning industries located in Vigo estuary were created at the turn of the century and are characterised by producing exclusively for exporting. The development of the canning industry in Vigo can be seen in the amounts exported through the Customs House of Vigo, amounts that make Vigo the first Spanish port in the export of canned fish from the first decade of the 20th century, a position maintained in subsequent decades. Canning specialisation in Vigo estuary and the characteristics of the internationally competitive sector enables us to affirm firstly that canning production increases considerably during the first decade of the 20th century and the sector is dedicated to export; secondly, the sector rapidly implements technological innovations, facilitating the consolidation of the canning industry in Vigo from 1910, which has continued to date; and finally, although the canning sector in Vigo begins as a producer of sardines, it will soon initiate a process of diversification of production to all types of canned fish products.

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