

# **The oilseed industry and the concept of competitiveness -A comparative analysis-**

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## **Abstract**

This paper aims at studying the competitiveness of the vegetable oil industry in Argentina. For this purpose, a level of aggregation lower than the industry was chosen, using both the firm and the specific products as the units of analysis. The study concentrates in the two most important products of the oilseed complex: soybean and sunflower oils, whose markets exhibit remarkably different patterns of behavior. In addition, they permit to analyze the competitiveness of the manufacturing stage in the productive chain. Comparisons between Argentina, Brazil and the EU are carried out, and various indicators related to the market and to the manufacturing sector in the oil chain are estimated.

**JEL:** L6

**Keywords:** Indicadores de competitividad - Industria aceitera - Cadena agroindustrial

## **I. Introduction**

The studies made on the evolution of the oilseed complex have demonstrated that it is one of most dynamic from the seventies, being also an important generator of exports. In this line, in a previous work of the author (1997), it has been studied, from a sample of companies, the exporting strategies of the companies by branch of activity and year of incorporation to the external market, as well as the degree of stability of such companies in the international markets. That study showed that the vegetable oil companies were the most stable. In addition, the estimated rate of export growth was higher than the average rate for the food sector, appearing like one of the sectors with greater dynamism and greater diversification of markets.

In a model of open economy like the one of the 90s, the Argentine oilseed complex seemed to exhibit, from its productive evolution and of its insertion in the international markets, excellent conditions to obtain strong levels of competitiveness, understanding it as the capacity of gaining and to maintaining markets simultaneously to the growth of the industry. In this way many studies of the oilseed complex emphasize the high levels of competitiveness of the vegetable oils industry. In this work the competitiveness will be considered from a different

perspective in which the unit of analysis is the company or the product instead of the industry. Hence, the competitiveness of an industry will be the result of the aggregation of the competitiveness of the firms, that is, the industries are competitive because the companies that integrates them, or the products that they commercialize, increase their participation in the international markets.

The objective of this study is to analyze the competitiveness in relation to the insertion of two of its more important products in the external markets, the soybean and the sunflower oils. Respect to the soybean oil, Argentina is today one of the main producers and exporters and, respect to the sunflower oil -whose traditional main destination was the domestic market with a high per-capita consumption- the country also displays today high volumes of sales to the external market. These two products were selected because, despite they belong to the same industry, their markets do not respond to a same pattern of behavior; in addition, both products integrate agro-alimentary chains, which makes possible to analyze the competitiveness into them.

Several indicators are considered in the analysis and, after a presentation of them, they are estimated for the period 1990-2000. In addition, given the meaning of the comparative dimension for this subject, comparisons between Argentina and Brazil will be made in relation to the U.S.A. and the European Union, their main competitors and/or buyers according to the product.

It is possible to emphasize, respect to both products, that both Argentina and Brazil face today a significant challenge in the international markets due to: the restrictive policies of access to the markets existent in the different countries, the subsidies of others nations to their exports, the sprouting of new competing countries and the increase of the participation of substitutes in the world commerce. If the domestic policies regarding deregulation, regional integration, and the degree of trade openness of national economies -that affect with different intensity the diverse sectors in the agro-industrial chain of the soybean and the sunflower complex- are added, then the challenge is still greater.

The increase of international competition and the domestic reconstruction require that, in addition to the comparative advantages the competitive ones be reinforced both at the sector level and at the company level; this could be accomplished through the implementation of appropriate policies that can generate the necessary incentives to increase their competitive potential. This policies would be better if the analysis of competitiveness, is made at a lower level of aggregation.

## **II. Methodological Aspects**

The competitiveness concept can have different meanings, as it can be found in the specialized literature. It is associated to the exporting performance of the industry, to the productive efficiency or multiple attributes of the company, among others, but there is not a consolidated body of knowledge that integrates the different points of view, neither does exist a single methodology of evaluation of this subject.

From the approach of competitiveness adopted in this study, one of the important dimensions to consider is the differentiation by products that generates the industry and the fact that each one of these belongs to an agro-alimentary chains with its own characteristics. From the point of view of the theory of systems, the agro-alimentary chain would constitute a system, and at the same time it would be integrated by subsystems. In particular, in the case of the oilseed complex, this one would constitute a system whose subsystems are primary production, manufacturing stage, commercialization, transport and distribution.

The company, as a unit of production, is also a system in itself and that, for the sake of the competitiveness analysis, presupposes its adaptation to the economic surroundings. In the agro-industrial chain of the soybean and the sunflowerseed, the stage of greater strategic importance is the crushing one, i.e. the gross vegetal oil industry which processes the soybeans and the sunflowerseeds. The companies integrating this manufacturing subsystem of the chain, are closely related to the agricultural production and so the soybean and the sunflowerseed are the main components of the production costs of the vegetable oil industry. These, together with the economies of scale of the process plants, the costs of transport and the tax structure are the key elements to the chain competitiveness.

This approach requires to consider organizational and institutional aspects that make possible to coordinate the stages of transformation and commercialization of the agro-industrial chain. This presupposes that the system can adapt its structure to obtain competitive advantages in a situation of change of the economic conditions, which is based on the transmission of information, the stimulus and the controls throughout the chain.

In this line of analysis the elaboration of quantitative indicators is required to respond to the proposed objective. These indicators are linked to the factors that determine competitiveness, which can be classified in:

- under the control of the company,
- quasi-controlable by the company,
- under the control of government and
- non-controlled.

In this paper the indicators relative to the market and those related to the manufacturing subsystem of the soybean and the sunflower complexes will be estimated and analyzed. These indicators correspond to the first two groups of factors mentioned above.

Regarding the indicators in relation to the market, the following will be considered:

- the participation of each product in relation to the total exports of vegetable oils and the participation of each competitor in world markets,
- the rate of imports penetration in the domestic market (RMP),
- the export net excess index,
- the rate of exposure to external competition (REC) and
- the ways of insertion into the market.

Regarding the indicators in relation to the manufacturing sector in the oilseed chain, the following will be analyzed:

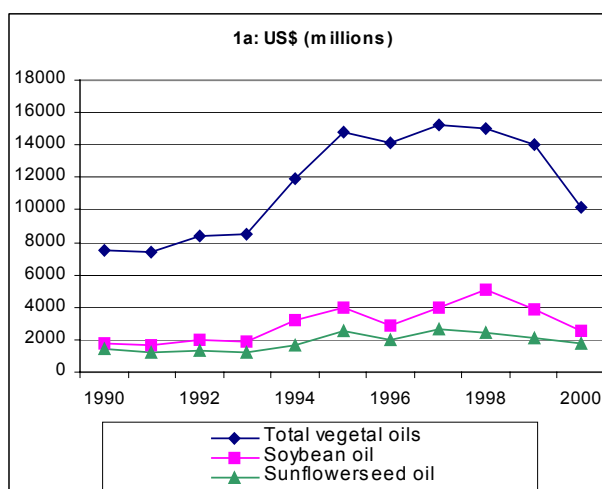
- the level of concentration,
- the capacity level,
- the rate of exports growth,
- the degree of exporting specialization and
- the productivity and the costs.

### III. Indicators in Relation to the Market

#### III.1. Rate of participation in world markets

Fig.1a shows the value of vegetable oils exports in the world market during the 1990s.

**Fig. 1a**  
World Exports - Soybean and Sunflower Oil

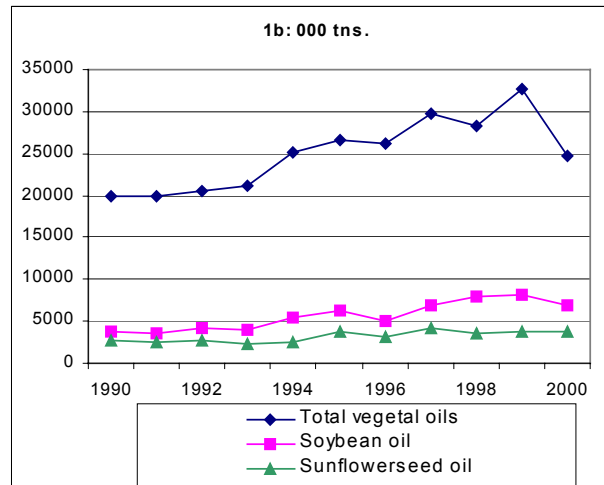


Source: Based on data from CIARA

It registered a fall in 2000, when the values were similar to those of the third year of the decade. A peak of 15,000 million US\$ was reached in 1998, falling after because of the diminution in the international prices of vegetal oils. In physical terms however, even though oscillating, an important annual cumulative growth of 2% in the period 1990-2000 is verified (Fig1b).

To be able to obtain the competitiveness level according to this indicator, a lower aggregation level was considered; this required to analyze the exporting performance for both the soybean and the sunflower oils. Together they represent the 90% of the external sales of the sector in Argentina.

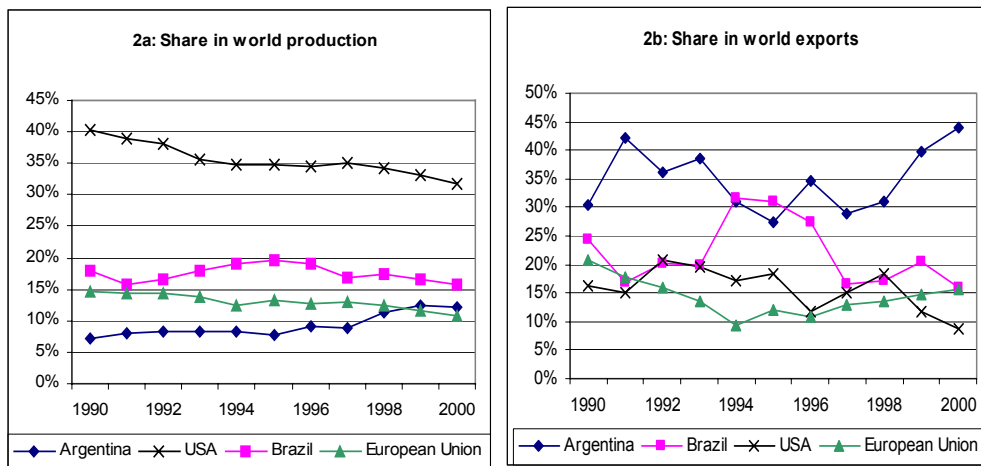
**Fig. 1b**  
World Exports - Soybean and Sunflower Oil



Source: Based on data from CIARA

In Fig. 2a it can be appreciated the production of soyoil for each supplier relative to world supply. The larger percentage corresponds to the United States - although it has been decreasing in the last decade- with Brazil and the European Union following it. Argentina, with a lower percentage, shows an increasing tendency, surpassing the European Union in 2000. All, except Argentina, are important consumers.

**Fig. 2**  
Soybean Oil  
( volumes)

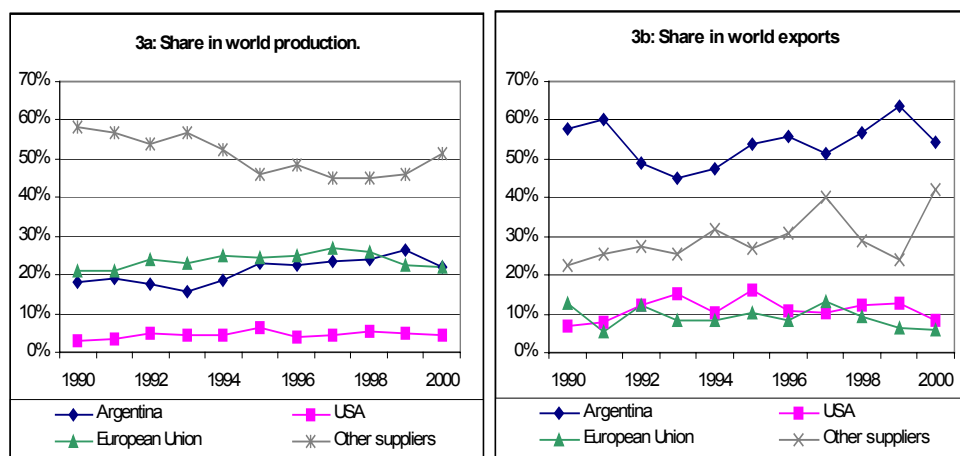


Source: Based on data from CIARA

In face of the changes in competitiveness, it is possible to expect variations in the participation of the exports in the world market. An increasing tendency in the volumes of soybean oil external sales is observed in Fig 2b, in which Argentina evidences a share of more than 44% of the world exports in 2000, increasing in 14 percentage points the portion of market that it had in 1990. The Brazilian exports situation is different; since 1995 -when its share exceeded 30%- it has been decreasing significantly to 15% in 2000, being similar to the percentage exhibited by the European Union. The United States, however, does not even reach 10%. It is observed that in general, the levels of participation of these three external competitors have been falling from the beginning of the decade.

Respect to the sunflower oil, Fig. 3a presents the European Union and Argentina as the main world producers. Argentina is, however, the most important exporter (Fig 3b).

**Fig. 3**  
Sunflower Oil  
(volumes)



Source: Based on CIARA data

In the case of sunflower oil, it can be seen in Fig. 3b that Argentina surpassed in 1999 the percentage reached at the beginning of the 1990s. However, since then its participation decreased to nearly 55% in 2000. On the other hand, the United States and the European Union display a certain regularity in their participation without greater variation between the beginning and the end of the decade. Each one participates with a 10%, a percentage substantially inferior than the share of Argentina.

From this indicator, it can be concluded that, in spite of the fact that Argentina had excellent volumes of soybean oil exports, the growth in its participation was irregular throughout the decade. Only in the 1997-1999 period the exported volumes were growing at an increasing rate. In the case of the sunflower oil, there is a small oscillation in the participation in the world exports in the decade in

comparison with the soybean oil; this variations followed closely the variations in the share in the world production.

In terms of the concept of competitiveness adopted in this work, in spite of the good evolution of this indicator, this is not enough to affirm the presence of high levels of competitiveness. In relation to the other exporters, the participation gap increases in favor of Argentina in the case of the soybean oil and it remains unchanged or it could be even reduced in the case of the sunflower, if other suppliers enter the market. The ex Soviet Russia is very important among the group named “other countries”. Its participation in this group is nearly 40% in the production and 22% for the exports.

### III.2. Rate of imports penetration (RMP)

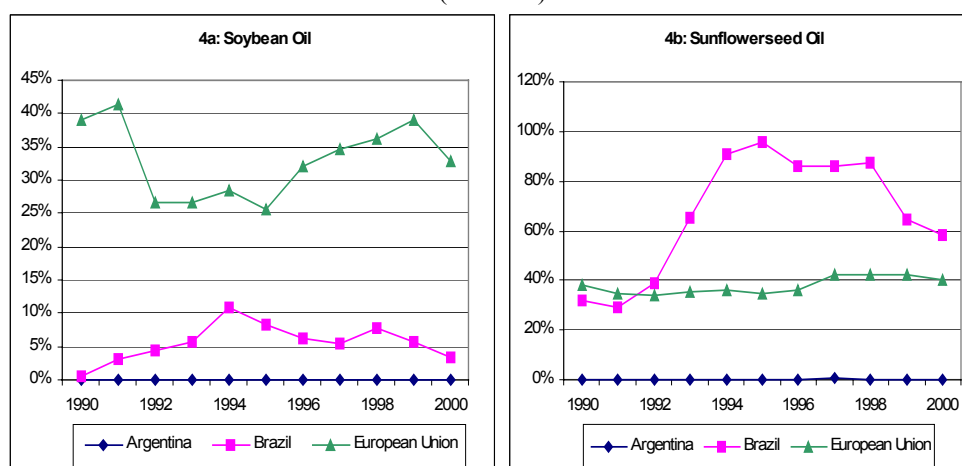
The rate of imports penetration measures the competitiveness of the sector in the domestic market and is defined as:

$$RPM_{ij} = \frac{M_{ij}}{C_{ij}} 100 \quad (1)$$

where  $M_{ij}$ : imports of i-th good by country j.

$C_{ij}$ : consumption of i-th good by country j

**Fig. 4**  
Evolution of the Rate of Imports Penetration (RMP)  
(volumes)



Source: Based on data from FAO

This coefficient shows the degree of foreign competition for domestic markets and is interesting to consider the differences that appear, between selected products of the sector, for the different suppliers considered in this study.

In the case of the soybean oil in Argentina, there was practically no competition in the domestic market (Fig.4a) whereas in Brazil the RMP was

always below 10% until 1994, when it started falling until 2000 to a figure lower than 5% (with an ascending peak in 1998). Respect to the European Union, the values of this indicator are comparatively higher and although at the beginning of the decade it exceeded 40%, at the end the rate descended to little more than 30%.

In the case of the sunflower (Fig 4b), the RMP was practically null in Argentina throughout the period considered in the study. For Brazil, the RPM is highly significant, but it is worth noting that both the volumes of import and consumption of sunflower oil are very low (like the domestic production) whereas the European Union registers an increasing RPM from 1996, getting above 40%.

Respect to this indicator undoubtedly Argentina faces virtually no competition at the domestic level, which can be seen as an advantage in relation to the other exporters, which have a domestic supply vulnerable to strong competition by the imported substitute products.

### **III.3. Indicator of export net excess**

The previous analysis can be complemented with the export net excess coefficient that is defined as:

$$ENE_{ij} = \frac{X_{ij} - M_{ij}}{Y_{ij} + M_{ij} - X_{ij}} \quad (2)$$

where:  $X_{ij}$  = Exports of i-th good by country j, in a given period.

$M_{ij}$  = Imports of i-th good by country j, in a given period.

$X_{ij} - M_{ij}$  = Trade balance.

$Y_{ij}$  = Domestic Production of i-th good by country j, a given period.

$Y_{ij} + M_{ij} - X_{ij}$  = Domestic consumption of i-th good by country j, in a given period.

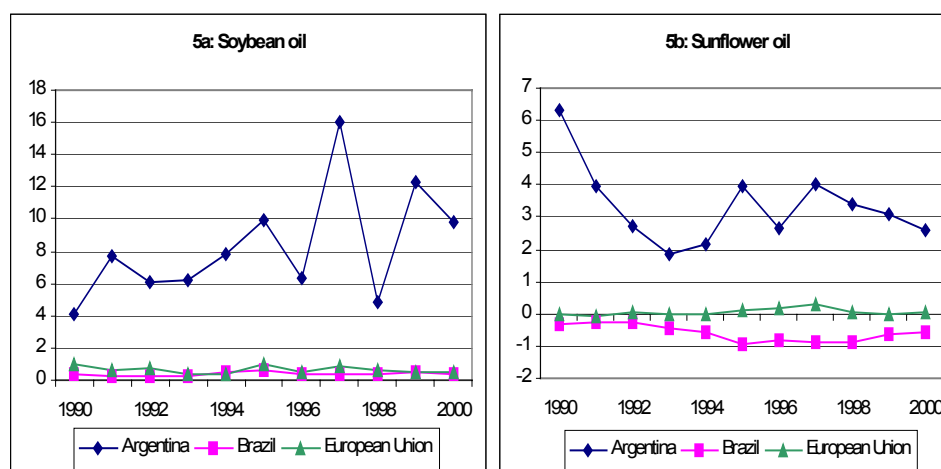
This indicator shows for a certain period, the capacity of each good in the chain to generate an exportable net excess in relation to the domestic consumption. From the values of this indicator, it can be shown that the net excess of soybean oil for Argentina is important in relation to its low domestic consumption, whereas for Brazil, a high domestic consumption occurs, whose oscillations constitute a restriction to the continuous flow of soybean oil exports. The values obtained for the European Union are similar to those of Brazil (Fig.5a).

In the case of the sunflower oil, the value of the index in Argentina dropped significantly from the beginning of the 1990s to the 2000, with a tendency to decrease further according to preliminary data for 2001. In Brazil, with levels of low production and consumption, this indicator stays relatively constant and negative, whereas for the European Union it is similar to the one for the soybean. (Fig.5b)

According to this indicator, only Argentina could generate an important net excess in relation to the domestic consumption.



**Fig. 5**  
Export Net Excess index  
(for volumes)



Source: Based on data from FAO

#### III.4. Rate of exposure to international competition (REC)

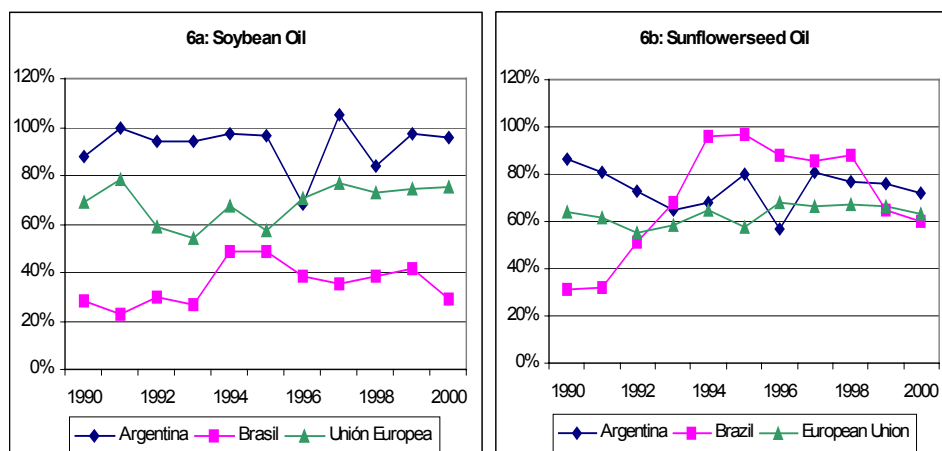
The rate of exposure is estimated in order to obtain a measure of the degree of exposure of the national production to foreign competition. The indicator is computed as:

$$REC_{ij} = \frac{X_{ij}}{Y_{ij}} 100 + (1 - \frac{X_{ij}}{Y_{ij}})RPM_{ij} \quad (3)$$

Since the production is sold both in the domestic market and in the external one, this indicator quantifies the percentage of the exports over the production ( $X/Y$ ) that is subject to the foreign competition in the international markets and the part destined to the domestic consumption ( $1-X/Y$ ), is also exposed to the foreign competition by the rate of imports penetration (RMP).

Again, in this case, the analysis by type of product registers differences at the time of deciding on the level of competitiveness of each product for each competitor. In Argentina, in relation to the soybean oil, the values are nearly 100% in 2000, given the high level of its exporting specialization, even though the RPM was null (Fig.6a). For the sunflower oil the values of REC also are high but lower than those of the soybean (Fig.6b), since they oscillate between 60% and 80%. The REC of Brazil for the soybean oil is lower than the one of Argentina, oscillating between 20% and 50% since its exported volumes are inferior and in addition, its exports are not significant in the domestic consumption as it is derived from its low RPM. In the case of the sunflower, Brazil is not a big supplier in the international market and has low level of consumption in the domestic market.

**Fig. 6**  
Rate of exposure to international competition (REC)  
(volumes)



Source: Based on data from FAO

For the European Union, the REC for the soybean oil is high but inferior to the value corresponding to Argentina, since it oscillates between 60% and 80%, because it had high competition in the domestic market but lower in the international markets in face to smaller participation in the world exports.

In the case of the sunflower oil in Argentina, although its participation in the world markets is highly significant, it faces the possibility of external competition in the domestic markets and by different reasons, related mainly to the variation of the production of seeds in the years considered, the external sales followed its tendency. In consequence, it lost positions in relation to the advance of the soybean oil: from a 54% of participation in the total vegetal oil exports in 1990, it dropped to 37% at the end of the decade.

In relation to the competitiveness levels, and from the estimation of the indicators related to the market, it is possible to infer that their value differs according to the product and the competitor. For Argentina, only in the case of the soybean oil it is possible to say, examining these three indicators, that the country exhibits good levels of competitiveness with a sustained growth of its external markets in which it has a significant share; this is reasonable under the conditions of facing no competition in the domestic market and of maintaining a high percentage of its production orientated to the external market.

It must be said that these indicators are not enough for the analysis, since they reveal ex-post competitive advantages, not considering the reaction of the companies, neither their cost of performance, nor their capacity of adaptation to the changing conditions of the market.

### III. 5. Ways of insertion into the market

This indicator, shows the exporting dynamics for each product respect to the total exports of the chain, evaluating its capacity of growth and its capacity of maintaining or increasing its participation. Two components are considered: the *positioning* and the *efficiency* indicators.

The Positioning indicator ( $GRX_{ij}$ ) is expressed as the annual growth rate of the exports of the *i*-th product by country *j*. The Efficiency indicator ( $GRPX_{ij}$ ) is defined as the annual growth rate of the exports participation of the *i*-th product in the exports of the chain in country *j*.

The differences between the products from these indicators occur by the magnitude of the indicator: the larger rates of growth indicate the greater relative competitive advantages. The combinations of these two indicators result in four possibilities of insertion: *positive*, *negative*, with *lost opportunities* or *vulnerable*. In the two first possibilities both coefficients are positive or negative respectively. When the positioning coefficient is positive and the one of efficiency is negative, the way of insertion is with lost opportunities and when the positioning is negative and the efficiency is positive the insertion way is vulnerable.

From the values obtained in Table 1 for the soybean oil, it is concluded that the way of insertion into the market differs along the years and among the competitors. In general the positioning indicator is more favorable to Argentina, presenting a predominant positive way of insertion, which is only reverted in 1999/2000 like same in Brazil and the European Union. In the case of Brazil, the years of positive insertion appear alternated with years of negative insertion and only in three years its growth rate was above the one of Argentina. The European Union, on the other hand, registers the four ways of insertion being its rate of positioning, in general, lower than the corresponding to the other countries.

**Table 1:** Ways of Insertion into the Market – Soybean Oil

Years	Argentina		Brazil		European Union	
	Positioning	Efficiency	Positioning	Efficiency	Positioning	Efficiency
1990/1991	0,242	0,002	-0,372	-0,435	0,003	0,025
1991/1992	0,060	0,131	0,469	0,134	0,033	-0,027
1992/1993	0,039	0,091	-0,048	-0,146	-0,237	-0,174
1993/1994	0,095	0,030	1,165	0,782	0,020	-0,115
1994/1995	0,029	0,039	0,162	0,214	0,332	0,394
1995/1996	0,096	-0,005	-0,245	-0,218	-0,147	-0,128
1996/1997	0,157	0,324	-0,155	-0,295	0,297	0,028
1997/1998	0,192	-0,246	0,214	0,121	0,147	-0,051
1998/1999	0,309	0,139	0,135	0,146	0,021	0,028
1999/2000	-0,028	-0,068	-0,308	-0,342	-0,058	0,045

Source: Based on data from CIARA and FAO

Considering the rate of efficiency, there is no continuous growth for the soybean oil, so it does not show an increasing participation in the chain exports.

To summarize, there is, according to the insertion way, an insinuated greater relative competitive advantages for the soybean oil in Argentina.

According to these indicators the competitiveness of Argentina for the sunflower oil was not strengthened, and only during two years of the period there are positive values for both growth rates. In addition, compared to the rate estimated for the European Union, there is not a permanent predominance of Argentina in the considered years, which could indicate a weakening level of competitiveness for this country in the case of the sunflower oil.

#### **IV. Indicators in relation to the Manufacturing Sector of the Chain**

It is interesting to consider the characteristics of the oilseed complex domestic market in which the exporting companies in Argentina are inserted, in order to infer about their strategies to respond to the challenge of the competitiveness.

One of the conditioner factors of the market is the technology that, in the Argentine case, can be put in the same level with the present international ones. Furthermore all companies can accede to this technology, since there are no barriers by patents that prevent it. This technical progress has been in answer to the changes of the demand of vegetal oils, which, grew in replacement of those of animal origin. Besides the production process is characterized by the presence of economies of scale and by a high regional concentration. In Argentina, the plants are of great operational capacity and four types of companies are distinguished:

- linked to multinational economic groups,
- linked to national economic groups,
- independent companies, not related to the former ones and
- plants operated by cooperatives firms.

To analyze diverse indicators in relation to the companies that integrate the manufacturing stage of the agri-food chain, a sample of nine companies of the sector was taken, with a volume of external sales that represented 50% of the total in 2000. The selection of the companies was done considering the availability of reliable information, the type of company as far as its dimension and the property of the capital.

##### ***IV.1. Level of concentration***

In Argentina a high economic concentration is registered, so the market structure can be described as oligopolistic. Of the total of companies, twelve concentrate the production, equivalent to the 70,5% of the capacity installed in 2000.

Comparatively in Brazil the situation is similar in relation with the modernization of productive processes, but the plant size is relatively smaller than in Argentina. Table 2 allows observing the different degree of concentration by plant size in both countries.

**Table 2:** Ways of Insertion into the Market – Sunflowerseed Oil

Years	Argentina		European Union	
	Positioning	Efficiency	Positioning	Efficiency
1990/1991	0,002	-0,055	-0,220	-0,137
1991/1992	-0,145	0,005	0,210	0,141
1992/1993	-0,275	-0,068	-0,084	-0,396
1993/1994	0,212	-0,078	0,084	0,115
1994/1995	0,700	0,098	0,199	-0,122
1995/1996	-0,062	-0,024	0,072	0,140
1996/1997	0,180	0,251	0,391	0,551
1997/1998	-0,107	-0,129	-0,290	-0,490
1998/1999	0,198	-0,048	-0,038	0,113
1999/2000	-0,164	0,153	-0,034	0,026

Source: Based on data from CIARA and FAO

As shown in Table 3, it is easily deduced that the highest concentration of plants occurs at sizes of more than 1500 t.p.d. (tons per day), due to the fact that those plants can operate with economies of scale. In the case of Argentina they represent a 78% of the total, in comparison to the 54,8% of Brazil.

**Table 3:** Distribution of plants by crushing capacity (1997)

Size	Argentina	Brazil
Less than 599 t.p.d.	6%	8,9%
From 600 to 1.499 t.p.d.	15%	36,3%
From 1.500 to 2.999 t.p.d.	46%	48,9%
More than 2.999 t.p.d.	32%	5,9%
TOTAL	100%	100%

Source: Based on data from CIARA y ABIOVE

The presence of economies of scale is traduced into the reduction of costs. On the basis of made studies, it would be possible to achieve a reduction of 15% in the costs when the scale is in the range 300-600 t.p.d., of 3.5% in the range 600-1000 t.p.d., of (a slightly larger) 7% in the range 1000-1500 t.p.d. and of 5.6% for scales between 1.500 and 2000 t.p.d.. (Nunes/Lazzarini, 1997)

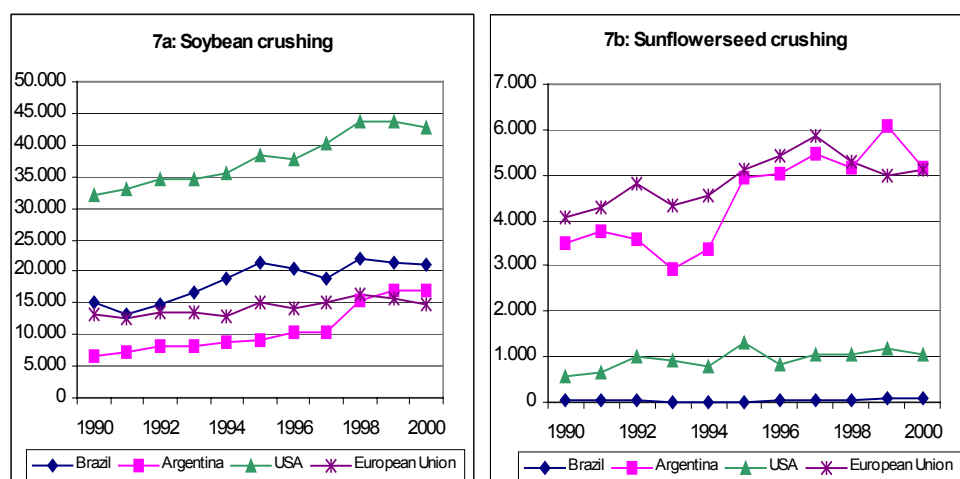
#### **IV.2. Installed capacity**

In the specific case of the soybean and the sunflowerseed, the crushing of oilcrops was growing in Argentina during the 1990s, reaching 70% to 80% of total harvest. In the crushing industry, the number of companies was reduced, while at the same time there were investments that modernized the plants increasing the scale, expanding the crushing and the manpower productivity.

Carrying out a comparison between the soybean and the sunflowerseed crushing for the countries considered, it can be observed in Fig. 7a that Argentina

presents the lowest level of soybean crushing; however, it also displays an increasing tendency, and beat the performance of the European Union at the end of the decade. In the case of the sunflowerseed, Fig. 7b shows that the European Union leads the world crushing followed closely by Argentina whose participation raised above the European Union's in 2000.

**Fig. 7**  
Crushing of each supplier.  
(000 tns.)



Source: Based on data from CIARA

The selected sample of nine companies of the sector displays a daily capacity of crushing of 41,714 t.p.d. (Table 4), representing 45% of the total capacity.

**Table 4:** Installed Capacity in sampled firms

Plants	Type of processed grain	Installed Capacity in 24 hs. (tonnes)
Aceitera Gral Deheza		
Aceitera Gral. Deheza SAICA (D. Velez Sarsfield)	M	500
Aceitera Gral. Deheza SAICA (Gral. Deheza)	S G	5.800
Buyatti SAICA		
Buyatti S.A.I.C.A. (San Martín)	S G	2.958
Buyatti S.A.I.C.A. (Reconquista )	A S G	1.456
Germaíz		
Germaíz S.A. (San Justo )	G	150
Germaíz S.A. (Baradero)	Mz G	410
Bunge Ceval (ex Guipeba)		
Tancacha	S M C	3.250
Molinos Cañuelas		
Molino Cañuelas S.A.C.I.F.I.A. (Cañuelas)	G S M	1.200

Plants	Type of processed grain	Installed Capacity in 24 hs. (tonnes)
continue		
Continue		
Nidera		
Nidera Sociedad Anónima (Saforcada, Junín)	G S	2.000
Nidera Sociedad Anónima (San Martín)	S G	1.900
Oleaginoso Oeste		
Oleaginoso Oeste S.A. (Daireaux)	G S	2.200
Oleaginoso Oeste SA (Gral. Villegas)	G	2.000
Oleaginoso Moreno		
Oleaginoso Moreno Hnos. SA (Bahía Blanca )	G	1.000
Oleaginoso Moreno Hnos. SA (Necochea)	G	1.500
Oleaginoso Moreno Hnos. SA (Tres Arroyos)	G	350
Pecom-Agra		
Pecom-Agra S.A. (San Lorenzo)	S G	4.500
Vicentín		
Vicentín SAIC (San Lorenzo)	S	5.500
Vicentín S.A.I.C. (Route 12, San Lorenzo)	S G	4.500
Total capacidad instalada		41.174

Note: S (soybean), G (sunflowerseed), M (peanut), A (cottonseed), C (cartamo) and Mz (corn)

Source: Based on data from CIARA

It is interesting to analyze the level of concentration in the crushing capacity. A comparison with the United States and Brazil reveals that, whilst in Argentina 12 plants, corresponding to the 10 greatest companies, have 70% of the capacity of crushing (the total for the country is 91,000 t.p.d.), the United States processes 67% in 41 plants of three companies, being the total capacity of crushing of 159,000 t.p.d.

In Brazil, the average crushing capacity of the companies is lower than the one for Argentina and the United States. The biggest company (Batista) crushes 3100 t.p.d., followed by Bunge-Ceval with 2200 t.p.d. In Argentina there are nine plants whose capacity exceeds 3000 t.p.d, and among them Louis Dreyfus reaches 12000 t.p.d. In the United States the largest plant (operated by Archer Daniels Midland Co.) processes 6804 t.p.d. followed by a plant owned by Bunge-Ceval which processes 4.354 t.p.d. In relation to the European Union, the operational capacity of the plants in Argentina is bigger too.

#### **IV.3. Growth and exporting specialization**

The participation of each company in the total exported by the firms in the sample and the rates of growth of the external sales for each one of the selected companies appear in Table 5. The annual cumulative average growth rate for 1990-99 period is 7,8% for external sales, differing substantially among companies with a standard deviation of 14.5%.

**Table 5:** Share and dynamics of sampled firms in the exported volume of oils.

Company	Share in exports*		Annual cumulative growth rate 1990/2000		
	1990	2000	Soybean Oil	Sunflower Oil	Total**
Aceitera Gral. Deheza	16,78%	23,68%	0,226	0,010	0,108
Buyatti	11,02%	0,38%	-0,170	0,035	-0,209
Germaiz	0,05%	0,31%	0,260	0,173	0,260
Bunge Ceval (ex Guipeba)	2,89%	4,69%	0,132	-0,012	0,122
Molinos Cañuelas	3,09%	1,02%	0,010	-0,082	-0,029
Nidera	8,15%	12,34%	0,093	0,330	0,115
Oleaginosa Moreno	20,08%	14,06%	0,677	0,039	0,039
Oleaginosa Oeste	16,00%	6,46%	0,113	-0,075	-0,011
Pecom Agra	-	10,88%	0,299	-0,252	0,299
Vicentín	21,96%	26,17%	0,125	0,092	0,091
Average			0,176	0,026	0,078
Total	100%	100%			

\*Exports of sampled firms.

\*\* Includes main vegetal oils exported (soy, sunflower and peanut)

Source: Based on data from Sagpya.

From the percentage of participation of each company together with its evolution, a different exporting dynamics can be deduced for each one. It is observed that the three largest exporters in 1990, still concentrate the highest percentages of external sales in 2000, despite they did not show the biggest growth rates in the considered period.

Observing the export growth rates of the soybean oil in relation to those of the sunflower oil, we can appreciate that the difference significantly favors the former. This might be explained by the increasing external demand for soybean oil, which is used in the food processing industry. Moreover, the domestic consumption is basically orientated towards sunflower oil, being less important the internal consumption of soybean oil.

In Table 6 the export specialization coefficient, i.e. the ratio export/sales, is computed for the firms of the sample during the last four years of the considered period. It is observed that the exporting specialization is elevated and has been increasing along the time, from 79% in the 1980s to 86% in the 1990s, what shows that the firms are mainly export-oriented.

The previous indicator can be complemented with the estimation of the index of specialization in oils export within the chain of the soybean and the sunflowerseed. The latter is defined as:

$$SI_{ij} = \frac{X_{ij} - M_{ij}}{\sum_{i=1}^{n_j} X_{ij}} \quad (4)$$

where:  $\sum_{i=1}^{n_j} X_{ij}$  : Total exports of the chain, in country j, in a given period.



This indicator expresses the share of the net exports by product in the total exports of the chain. The products considered in the chain are: beans (or seeds), oil and flours.

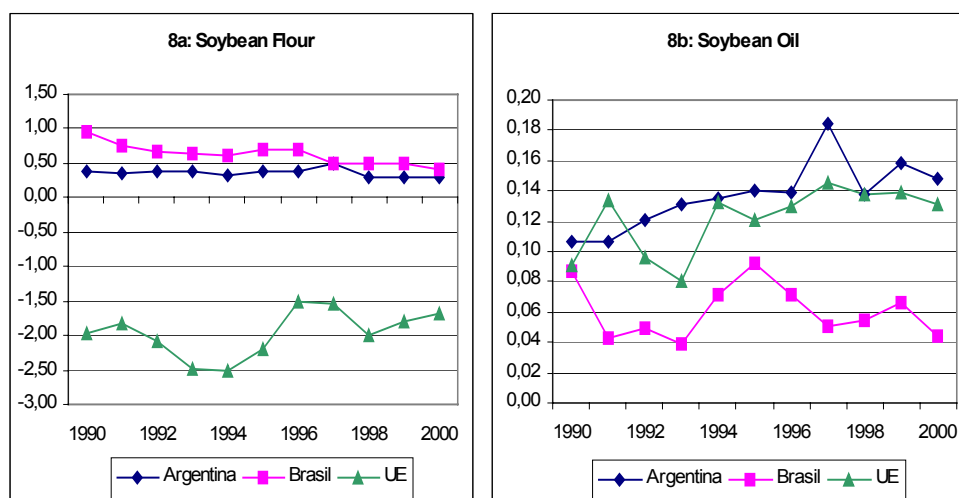
**Table 6:** Exporting specialization in the sample firms (%).

Firms	1997	1998	1999	2000
Aceitera Gral. Deheza	86,2	76,2	71,5	89,5
Buyatti SAICA	100,0	100,0	67,2	100,4
Guipeba	77,4	79,4	81,3	100,0
Molinos Cañuelas	23,5	8,4	8,3	29,8
Nidera	74,6	64,3	61,7	63,4
Oleaginosa Oeste	90,1	92,5	80,5	100,0
Oleaginosa Moreno Hnos.	90,8	57,4	97,3	90,9
Pecom-Agra	96,2	52,7	88,7	71,4
Vicentín		83,1	87,9	83,0
Export/Total Sales	99,8	71,6	73,6	81,6

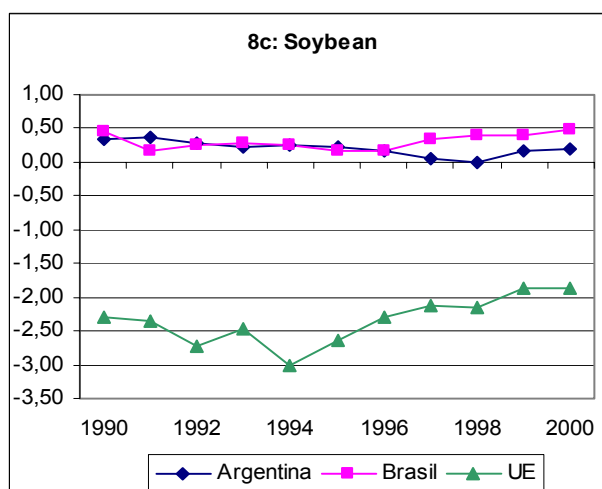
Source: Based on data from Mercado and Prensa Económica

Observing the values of this index (Fig.8) for the soybean chain products, both the flours and the beans show for Argentina a decreasing tendency in the decade, whereas the oil accuses a greater dynamism evidenced in an growing share in the index. For Brazil a relative stagnation is observed in flours as well as in soybean, whereas for the oil the index values exhibit permanent oscillations with a decreasing tendency in the share.

**Fig. 8**  
Specialization Index by product in the soybean chain



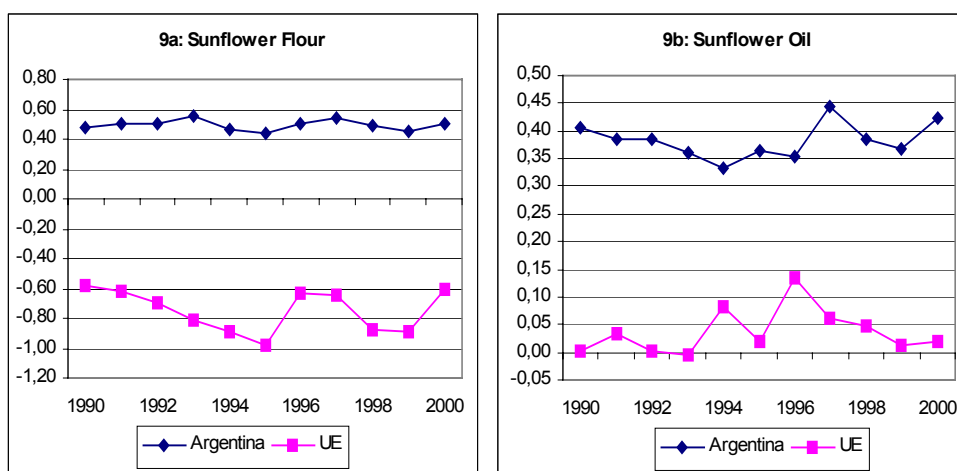
Source: Based on data from FAO



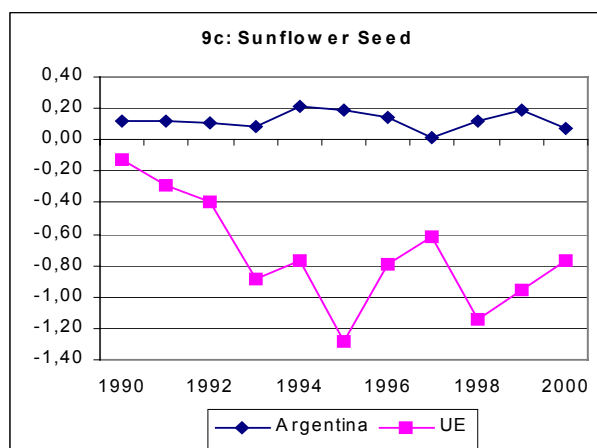
Source: Based on data from FAO

The situation of the European Union is different, both the soy flours and the soybean register negative indices, as a result of the important volumes of imports, while the oil index increases its values throughout the decade. An index of increasing specialization for the soybean oil, in Argentina and in the European Union as well, shows a greater relative competitiveness for this product.

**Fig. 9**  
Specialization by product in the sunflower chain



Source: Based on data from FAO.



Source: Based on data from FAO.

In the case of the sunflower chain, there is a relative stability of the index for the flours and the seed in Argentina, being negative the values for the European Union because of the imports made by the countries that integrate the Union. In the case of the oil, since 1996 the tendency is decreasing for the European Union while in Argentina, the index values do not allow to infer a significant dynamism in the participation that would permit to affirm the greater relative competitiveness of the product in the chain.

#### ***IV.4. The productivity and the costs***

To analyze the productivity and costs –crucial determinants of competitiveness- it becomes necessary to distinguish the primary sector from the manufacturing sector within the oilseed chain. Undoubtedly, the agricultural production of soybean and sunflowerseed is important for the vegetable oil industry, because the growth of its capacity of processing depends basically on the increase in crop production and on the lower price of oilseeds, what would also diminish the cost of the raw material for the elaboration of oils.

The growth of the manufacturing activity is derived, in this industry, from the presence of economies of scale and/or from the reduction of idle capacity which favorably affects the costs of the vegetable oil industry. The growth of the oilseed production in Argentina has been constant in the last three decades, which is deduced from the percentage variations showed in Table 8. The crop crushing and the exports also underwent a significant expansion. With no doubts the soybean harvest, that reached 26 million of tons in 2000/2001, was the main determinant of this growth. At the same time, the manufactured oil registered a great expansion in its production as well as in its exports.

In the case of the soybean and the sunflowerseed the strengths of the primary sector are the high level of technological adoption and the quality of the products along the chain. For the soybean, the improvements in genetic developments and the expansion of the harvested areas with different characteristics, among other elements, lowered the comparative costs of the primary production. In the case of the sunflowerseed, the introduction of a good level of genetic research improved the product but with little differentiation of it. In general the technological innovation in soybean and sunflowerseed has had good effects on the yield and the quality of the final product.

From the figures in Table 7 it can be observed that the oilcrop yields (soybean and sunflowerseed) in Argentina were in 2000/2001 above the average of the 1990s. The soybean registers high yields throughout the whole period, while the sunflowerseed yields have increased in the 1980s.

**Table 7: Oilseed Complex Indicators (000 has. or 000 tonnes)**

Crop/Product	1990/1999 Averages		
	Argentina	Brazil	European Union
<b>SUNFLOWER</b>			
Harvested Area	2.819,62	32,10	2477
Grain Production	4.758,64	41,80	3772
Yield (tn/ha)	1,69	1,30	1,53
Grain Milling	4.382,24	29,11	4868
% of milled grain	92%	73%	90,7%
Oil Production	1.764,13	11,36	2017
Grain Exports	473,55	6,10	854
Oil Exports	1.344,88	0,73	819
<b>SOY</b>			
Harvested Area	5.887,79	11.449,60	425,2
Grain Production	12.993,41	25.832,20	1307
Yield (tn/ha)	2,21	2,23	3,08
Grain Milling	10.155,20	18.271,70	14311
% of milled grain	78%	71%	89,3%
Oil Production	1.789,71	3.454,80	2575
Grain Exports	2.714,43	5.356,10	495
Oil Exports	1.704,10	1.139,90	1360

Source: Based on USDA, Sagpya and FAO data.

Taking into account the comparative dimension of the problem it is necessary to evaluate the soybean yields of the main competitors in the international markets. In face of the Argentinian average productivity of 2.21 in the 1990s, Brazil appears with 2.23 t.p.h. and the European Union with 3.01 t.p.d. It is worth noting that, despite yields have increased in Argentina in 2000/2001 to 2.64, this figure is still below Brazilian yields (2.78); meanwhile the European Union maintains its average of 3.01 tn/ha. In the case of the sunflower Argentina has the greatest yields of the decade with 1.69 tn/ha, followed by the European Union with 1.53, and finally Brazil with a yield of 1.3 tn/ha.

Table 8 shows a strong growth of the whole indicators of the soybean and of the sunflower in Argentina and in the European Union during the 80s respect to the 70s, whereas in the 90s the growth is smaller. In the case of the sunflowerseed the

indicators for Argentina were still growing in 2000, while in the European Union almost all of them have decreased. For the soybean, the crushing, the oil production and the exports in the European Union, all grew in relation to the average of the 1990s, but this growing tendency was more moderate than the Argentine one. In the case of Brasil the sunflowerseed is of little significance, although it is increasing, and in the case of the soybean the oil production does not register a big increment and the exports decrease.

**Table 8:** Oilseed Complex Indicators – Variation of average values.

Crop/Product	Argentina			European Union		
	Variation	Variation	2000	Variation	Variation	2000
	1980/1989 vs. 1970/1979	1990/1999 vs. 1980/1989		1980/1989 vs. 1970/1979	1990/1999 vs. 1980/1989	
<b>SUNFLOWER</b>						
Harvested Area	48,0%	40,8%	3.477	241,4%	46,0%	2130
Grain Production	142,5%	88,8%	6.070	531,0%	49,4%	3.387
Yield (tn/ha)	63,8%	34,1%	1,75	62,8%	9,3%	1,74
Grain Milling	129,8%	86,7%	5.149	231,7%	62,9%	4.710
% of milled grain	-5,2%	-1,1%	85%	0,1%	-4,5%	94,1%
Oil Production	173,7%	91,6%	2.158	251,8%	62,4%	1.946
Grain Exports	553,2%	257,1%	283	2297,2%	-1,0%	638
Oil Exports	729,2%	109,8%	1.562	329,1%	73,5%	823
<b>SOY</b>						
Harvested Area	514,3%	98,4%	8.638	2088,6%	85,0%	345
Grain Production	508,7%	119,8%	20.207	4275,0%	86,7%	1.039
Yield (tn/ha)	-0,9%	10,8%	2,34	73,8%	18,9%	3,01
Grain Milling	896,0%	199,2%	17.031	22,6%	7,2%	16891
% of milled grain	63,6%	36,1%	84%	-4,7%	-4,6%	98,9%
Oil Production	918,5%	213,2%	3.113	22,5%	9,6%	3.045
Grain Exports	278,3%	30,3%	4.077	35,4%	153,8%	689
Oil Exports	1082,6%	248,1%	2.975	62,8%	2,5%	1.756

Source: Based on data from USDA, Sagpya and FAO .

The values of the indicators for Argentina are positive to the competitiveness level in the soybean case, while for the sunflower this consideration it is not conclusive.

The growth of the agricultural production and the greater productivity made possible for the industrial companies of the chain to operate plants of larger scale, to have less idle capacity and to operate with pecuniary economies by purchasing raw material at lower prices. However, differences between the levels of productivity of the sector and the companies can be observed.

Those facts can be inferred from Table 9, which registers the decrease in the number of plants at the sector level, together with the increase in the average crushing capacity in those plants as well as in the yield per worker. About the companies, on the basis of the data collected for firms with large crushing capacity, the sales per employee differ in value and behavior among them. The same thing occurs in the case of the levels of returns -measured as utilities divided by sales- which diminish substantially in 2000.

**Table 9:** Oilseed Industry Indicators

	1983	1993	1998	2000
<b>Sector</b>				
Plants	55	59	49	46
Employees	8633	4934	5000	s/d
Milling/plants (000 tn/pta.)	106	207	237	s/d
Production/employee (tn/man)	676	558	1131	s/d
<b>Firms</b>				
Sales/Employee (millions US\$)				
Aceitera Gral. Deheza	s/d	s/d	0,55	0,50
Bunge Ceval	s/d	0,78	1,51	2,17
Pecom-Agra	s/d	s/d	2,06	1,89
Returns (% util./sales)				
Aceitera Gral. Deheza	s/d	1,46	1,19	0,24
Bunge Ceval	s/d	1,24	1,68	
Pecom-Agra	s/d	-0,61	1,52	0,22

n.d: no data

Source: Based on data from CIARA, SAGPyA , magazines Mercado and Prensa Económica

It must be taken into account that since 1991 many conditions have changed, and some of them helped to the expansion of crops during the 1990s (Table 8). In addition, the opening of the economy lowered the costs of many inputs, which added to the export tax reduction benefited the producers. The difference in the participation of the cost components affects the results, which differ remarkably between both productions.

The indicators of production costs corresponding to soybean and sunflowerseed for the end of the decade are detailed in this section, showing that there are significant differences for both products. The costs of the primary stage in each chain are described in Table 10, while Table 11 shows the costs of elaboration of oil.

**Table 10:** Raw Material Cost

Cost component	Soybean	Sunflowerseed
	Share %	Share %
Rent, renting expenses	22,04%	24,50%
Production expenses	28,15%	28,07%
General expenses	23,49%	29,83%
Commercialization expenses	9,45%	12,26%
Returns	16,87%	5,34%
Total	100,00%	100,00%

Source: Based on data from CIARA

In Brazil the rent is lower than in Argentina due to the greater abundance of available earth to cultivate, therefore the competitive advantage is greater in the former country. In addition the incidence of the costs of transport is significant in both countries but the natural advantages compensate them. Nevertheless these costs were smaller in Argentina than in Brazil.

Table 11 shows the cost components and the relative importance in the total, for each product and for each stage in the oil production. It is clear that the crushing stage has the greater participation. The utility margins of the companies are to a large extent conditioned by the raw material prices, more in the case of the sunflowerseed than in the case of the soybean: to obtain one refined ton of sunflower oil 2.35 tn of seed are required while in the case of the soybean 5.56 tn are needed, despite the cost of the soybean in 1999 represented 36% of the sunflowerseed cost.

**Table 11: Cost Structure of Producing Soybean and Sunflower Oils**

Cost component	Sunflowerseed Oil	Soybean Oil
	Share %	Share %
- Crushing	60,46%	43,59%
Raw material cost	45,97%	20,25%
Laboral cost	2,38%	2,42%
Direct inputs	2,09%	6,21%
Raw material transport	5,13%	2,95%
Others	4,90%	11,76%
- Refined and Package	29,67%	39,09%
Direct inputs	19,95%	23,02%
Laboral cost	3,91%	2,85%
Others	5,81%	13,22%
- Financing expenses	2,03%	2,62%
- Commercialization expenses	6,67%	12,92%
Transport	0,96%	8,01%
Others	5,71%	4,91%
<u>UTILITY</u>	1,17%	1,78%
TOTAL	100%	100%

Source: Based on data from CIARA

It is worth noting the relatively low incidence of the manpower in both oils, the relevance of the transport in the commercialization and the significant fiscal incidence. Electricity is the most important direct input in the refining stage and in the case of commercialization expenses the most significant cost are the harbor and the custom agent expenses, although these costs have decreased in the 1990s, since the FAS price represented a 60% over the FOB price in the 1980s and a 92% in 1993 (Obschatko, 1997).

From the above cost structure, the importance of the different policy decisions can be assessed. These policies might change the structure, affecting the utility margins and the competitiveness levels, which also may be affected by the relations among the different linkages in the chain.

In order to complete the analysis, it is necessary to take into account the systemic competitiveness of vegetal oil companies, because a smaller capacity of coordination of the raw material flows in the chain can reduce that competitiveness. In addition, the companies can have a differentiated competitive performance based on their capacity of adjustment to the national and international competition, as a result of their particular strategies. Considering the fact that many countries around the world are practicing protectionist policies to encourage their own production and the expansion of their external sales, differential tariffs for oils and crops were implemented in Argentina. This last policy contributed to reduce the systemic competitiveness of the chain. The negative effects were reverted slowly along the 1990s. Today this differentials tariffs are back and the adverse consequences over the systemic relations can, in a near future, reduce the competitiveness levels of the chains, limiting the expansion to the international markets.

#### ***V. Conclusions***

- The soybean and sunflower oils are facing a high competition in the international markets and it is necessary to take adequate decisions, at government and company levels, to improve their competitiveness. The increase in substitutive products in the international markets can change the profile of the demand and in addition they can be more competitive in terms of prices.
- The agricultural productivity by itself is not a good indicator of competitiveness, since the intensity of inputs usage depends on its productivity and on the price of other factors as well. The indicators of exports performance do not show the problems of competitiveness of the chain either, since they are derived from the analysis of the relations between the segments compounding the chain.
- It is necessary to determine the competitiveness levels to make an analysis by product in the corresponding agro-alimentary chain, in order to elucidate the factors that restrict or favor it. This analysis guarantees that the most appropriate strategies will be taken, by the companies and by the government, to allow the increasing insertion of products of the chain in the international markets.
- The comparative dimension cannot be omitted in the analysis either because this permits to clarify the factors that favor or restrict the competitiveness in relation to the other suppliers. The analysis of different indicators allows to see the relative position by product. In this comparison it is advisable to consider aspects related to the natural resources, the technological level, the manpower, the domestic market and the systemic factors all of them related to restrictions of firm infrastructure, taxes, financial, and coordination within the agro-alimentary chain.
- The intervention of the government must improve the systemic factors in the competitiveness chain and the mechanisms of coordination of its agents, since non



appropriate decisions, can alter the relative structure of costs and affect negatively the competitiveness levels. Particularly, in the case of the products analyzed, this would be observed in decisions that affect the transport costs, such as the increase in the price of fuel, or in changes in the tax structure that affects the inputs costs and disarticulates the relation between the different segments in the agro-industrial chain, or in higher electrical tariffs that increase the manufacturing costs.

- In the 1990s, and comparatively to Brazil, Argentina exhibited a larger competitive advantage for the soybean, due to the weather and systemic factors. As in Brazil, the capacity of its plants allowed it to operate with economies of scale reducing the costs. In addition, the two countries did not present a technological lag unfavorable to the competitiveness levels. In relation to the European Union, Argentina also has competitive advantages, but it is wise not to underestimate this strong buyer which is also a significant producer with good levels of yield.

- Within the restrictive factors for the Argentine vegetable oils industry, we can count the reduced dimensions of the domestic market that force it to expand externally and, in the long term, it is likely that the availability of arable areas decreases; this same factor will be favorable to Brazil to enhance its level of competitiveness.

- Within the restrictive factors for the Argentine vegetable oils industry, we can count the reduced dimensions of the domestic market that force it to expand externally and, in the long term, it is likely that the availability of arable areas decreases; this same factor will be favorable to Brazil to enhance its level of competitiveness.

- Argentina has lost markets because of new competitors and because of policies of imports substitution of some countries. Despite the levels of competitiveness reached are high, in the comparisons with its competitors, Argentina registers a relative stagnation that is accentuated in the case of the sunflower complex. In spite of having a good level of agricultural productivity, this has been surpassed by the EU and by Brazil since 2000 and, in front of unfavorable changes in the real rate of exchange, Argentina could lose its relative competitiveness.

- Finally, it must be added that the market dynamics for the two products studied is different and consequently, the strategies followed by the companies to respond to these challenges are the key to the competitiveness levels.

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