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## The Structure and Fundamental Problems of Vegetable Oil Industry in Turkey

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There are 167 oil factories in Turkey, with a capacity not only to meet Turkey's domestic demand but also for export purpose. Of these, 8 are concerned with the production and the marketing of margarine, while the others process unrefined and refined oil. In Turkey, the vegetable oil industry has a capacity about 6 million tons of seed grounding and 3 million tons of unrefined oil capacity. In addition, there is also a 950 thousand tons capacity for margarine production. However, the insufficiency of unrefined material has resulted low level capacity usage. For example, the capacity usage was realized as 50% for seed grounding, 47% for unrefined oil production and 40% for margarine production.

In this research, the various problems such as quality of unrefined material, finance, storage, etc faced by the vegetable oil industry, from the supliance of unrefined material to domestic and international marketing have been investigated. This study was carried out thoroughly in Turkey for aiming to identify measurements in order to vegetable oil industry could operate near to full capacity.

**Key words:** oil seed, vegetable oil, industry, agricultural policy

### Türkiye Bitkisel Yağ Sektörünün Yapısı ve Karşılaşılan Temel Sorunlar

Türkiye’de 167 adet bitkisel yağ fabrikası bulunmakta olup, bu fabrikaların kapasitesi iç piyasa ihtiyacını karşılamasının yanında ihracat yapabilecek seviyededir. Fabrikalardan 8 tanesi margarin, diğerleri ise hem ham yağ hem de rafine yağ üretimi yapmaktadır. Türkiye’deki bitkisel yağ sanayi 6 milyon ton tohum kırma, 3 milyon ton ham yağ üretme kapasitesine sahiptir. Ayrıca 950 bin ton margarin üretme kapasitesine sahiptir. Buna karşılık, yeterli hammadde temin edilemediğinden dolayı kapasite kullanımları tohum kırma %50, ham yağ da %47, margarinde de %40’dır.

Bitkisel yağ sanayinin hammadde temininden, pazara sunulma aşamasına kadar karşılaştığı çeşitli sorunlar (hammadde kalitesi, finansman, depolama vb.) analiz edilmiştir. Türkiye ölçeğinde yapılan bu çalışmada, elde edilen bulgular doğrultusunda bitkisel yağ sanayinin tam kapasite ile çalışmasını sağlayacak önlemlerin neler olduğu ortaya konulmuştur.

**Anahtar kelimeler:** yağlı tohum, bitkisel yağ, sanayi, tarım politikası

### Introduction

Together with carbohydrates and proteins, vegetable oil is one of the basic components of human nutrition. Vegetable oil is produced from oil fruits such as olives and palm and industrial plants such as soy beans and cotton seed, as well as from plants with oil seed, e.g. sunflower,

Global annual production of oil seed is 326 million tons and, in 2002, around 93 million tons of vegetable oil was produced (USDA, 2003). In 2001-2002, Turkey produced nearly 2

million tons of oil seed, of which 1.33 million were cotton and 530 thousand tons of sunflower seed. The remainder was composed of soy bean, peanuts and sesame. In addition, it is estimated that, in 2002-2003, 140 thousand tons of olive oil was produced (Goksu, 2003).

Major oil seed producer country (USA) supplies 14.3 million tons and EC (25 country) supplies 9 million tons of oil seeds. Developing countries Turkey and Mexico produce 765 thousand tons and 296 thousand tons oil seeds

respectively (FAO, 2004). Both USA and EC support their oil seed producers. On the other hand, support for oil seed production in developing countries is inadequate. Developing countries should support their producers as developed countries so as to increase oil output, which is very important for community nutrition.

In Turkey, around 2.5-3 million tons of oil seed are processed in order to obtain oil. The most frequently processed seed, around 1.35 million tons, is cotton. It is preceded by sunflower, 780 thousand tons, and soy bean, 375 thousand tons (Unakitan, 2003).

There are 167 oil factories in Turkey, with a capacity not only to meet Turkey's domestic needs but also for export (Inan et.al, 2002). Of these, 8 are dealing with the production and marketing of margarine, while the others are active in the production of unrefined oil, refined oil or both.

The Turkish vegetable oil industry has capacity for about 6 million tons of seed grounding and 3 million tons of unrefined oil capacity. In addition, there is a capacity for the production of 950 thousand tons of margarine. The sector's seed grounding capacity is more than the necessary required to cover the country's needs. However, the insufficiency of the production of unrefined material means that only 2.5-3 million tons of seed are grounded annually. While the amount of capacity used varies on a yearly basis, it is generally between 40-50%. Around 47% of unrefined oil production capacity and 40% of margarine production capacity is used (Inan et.al, 2002).

While annual per-capita oil consumption is around 27 kg in developed countries, it does not exceed 18-19 kg in Turkey. The WHO recommends that 1/3 of people's daily energy requirements should be supplied by oil. But, only 18.38 kg per person of liquid oil is consumed annually in Turkey, and consumption is, therefore, not at the levels found in developed countries. If oil consumption reaches the levels in developed countries, it is thought that Turkey's oil deficit and consequently

imports of oil seed and oil will increase. According to the FAO's 2000 figures, around 1.4 million tons of unrefined oil, domestic and imported, was processed.

The average annual production capacity of Turkey's margarine producing firms is approximately 950 thousand tons, while production ranges within 370-400 thousand tons. Margarine producing firms use less of their capacity, 39-42% (Kubas et al., 2003).

Of Turkey's 1.5 million ton annual production of vegetable oils, 45% is supplied domestically, while the remaining 55% is imported. According to June's Oil World, Turkey's annual production of vegetable oils, measured from October 2001 to September 2002, is around 734 thousand tons, while 927 thousand tons of vegetable oil was imported in the same period (Oilworld, 2001).

This study is based on interviews with the managers of 102 of Turkey's 167 vegetable oil producing firms, the results of which were used to analyse the problems faced by the sector.

### **Materials and Methods**

There are 167 oil factories (except olive oil plants) in Turkey, with a capacity not only to meet Turkey's domestic needs but also for export. Of these, 8 are concerned with the production and marketing of margarine, while the others are active in the production of unrefined oil, refined oil or both.

The study aims at examining all 167 vegetable oil production firms. However, for several reasons, information could only be collected from 102 of these 167 firms, representing 61% of the total. This data taken from the project supported by TUBITAK-TOGTAG (Inan et al., 2003).

Together with these firms, the managers of the Vegetable Oil Producers Organization and the Trakya Vegetable Oil Producers Organization were interviewed in depth and, according to the information acquired, the sector's present situation and problems were identified.

plant process both unrefined oil and refined oil.

### **Results**

Structure of vegetable oil industry shows that the number of unrefined oil plant is very high (Table 1). Moreover, major number of the

Table 1. The Structure of Vegetable Oil Sector

Type of Extraction and Refining	Plant (number)	Ratio (%)
Unrefined oil	64	41.83
Unrefined oil + Refined oil	51	33.33
Refined oil	23	15.03
Refined oil + Margarine	6	3.92
Unrefined oil+ Refined oil + Margarine	4	2.61
Purina oil	3	1.96
Unrefined oil +Purina oil+ Refined oil	1	0.65
Acid Oil	1	0.65
Total	153*	100.0

\* Physical figures of plants found from records outside the sampling.

Unrefined oil supply: Over 80% of unrefined oil used is either produced by the firms or bought on the national market. This high percentage is explained by smaller firms' preference for the national market. Imported unrefined oil accounts for 20% of the market. In spite of this, 8.5% of firms, generally large firms, work only with imported unrefined oil. Consequently, the difference between the figures for nationally produced and imported unrefined oil is natural.

The main reason why firms prefer imported unrefined oil is that there is no acidity and sediment in the product. Another factor is the high quality of the product. In many personal interviews, the firms complained of the low quality and high acidity of nationally produced unrefined oil.

Seed supply: The national market is the most important source of seed procurement. 65.5% of the seed used by the firms are nationally produced. 22.2% of firms use only

nationally produced seed. This is, as has been explained above, due to the fact that smaller firms do not have the resources to import seed.

For climatic reasons, nationally-produced seed are normally bought in September, October and November. As purchase of nationally-produced seed declines from December and onwards, the purchase of imported seed increases (Table 2).

Over 90% of seed are processed between September and December. Although this declines from January on, the rate of seed processing is still around 70%. Unlike seed, unrefined oil is processed in 12 months of the year (Table 2).

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Table 2. Procurement and Processing of Unrefined Materials According to Month

<b>Intensity of Nationally Produced Seed Purchase According To Season (%)</b>											
Jan.	Feb.	Marc.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
22.7	18.2	11.4	11.4	9.1	9.1	9.1	29.6	100.0	100.0	79.6	54.6
<b>Intensity of Imported Seed Purchase According To Season (%)</b>											
Jan.	Feb.	Marc.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
69.7	72.7	57.6	54.6	51.5	33.3	15.1	15.1	27.3	39.4	45.5	57.6
<b>Intensity of Seed Processing According To Season (%)</b>											
Jan.	Feb.	Marc.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
72.7	69.7	69.7	57.6	54.6	54.6	48.5	60.6	90.9	90.9	93.9	93.9
<b>Intensity of Unrefined Oil Processing According To Season (%)</b>											
Jan.	Feb.	Marc.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
95.0	95.0	95.0	95.0	95.0	95.0	95.0	100.0	100.0	100.0	95.0	95.0

Table 3. Reasons For Preferring Imported Seed

Preference Factors	%
Low price	69.7
Cleanliness	57.6
High oil content	36.4
Different harvest season	33.3
High protein content	21.2

Low cost is the main reason for preferring imported unrefined oil. This is followed by the need for unrefined materials (Table 4).

#### Strategies Followed by the Firms

The Table 5 indicates that the main goal of the firms is to increase their market share. In addition, medium size firms aims at increasing investment and technology.

#### Major Criteria on Producing and Emerging Issues

70.2% of firms state that market demand is the first criterion they take into consideration when planning production. This high figure indicates that the firms are very sensitive to demand. Most of the firms that put this criterion in first place are small or medium-sized. These firms, whose marketing research tends to be inefficient, act according to the demand of middlemen and wholesalers, as they do not have direct contact with consumers. As a consequence, market demand in this context actually refers to the middlemen's and wholesalers' demand. In contrast, larger firms, and those with their own brand name, state

market demand in a lower position.

According to the survey, the most important problem faced by the firms is bureaucracy (Table 6). This is followed by problems with the seed and, in third place, sales problems. An interesting point here is that although unbranded sales and unfair competition are some of the most serious problems faced by the sector, this is not reflected in the survey results. The reasons for this will be examined in another chapter.

#### Pricing Strategies

In last few years, the firms' pricing strategies have been significantly affected by economic conditions, which have negatively affected the real sector and caused a decline in consumers' real income. The great part of the firms (62.8%) fixes prices according to cost (Table 7). This allows the firm to sell its producers while making a certain amount of profit. However, due to the current economic stagnation, the firms' profit margin has significantly decreased.

Table 4. Reasons for Preferring Imported Unrefined Oil

Factors Influencing Preference	%
Low price	69.6
Need for raw material	52.2
Guaranteed and punctual delivery	8.8
Low acidity	4.4

Table 5. Strategies Followed by the Firms

Strategies	%
Increase in market share	60.8
Growth	49.1
Profitability	41.2
Quality	35.3
Image	23.5
Development of new products	15.7
Relations with investors	7.8
Physical resources	7.8
Personnel training	7.8

Table 6. Problems Faced by the Firms

Problems	%
Bureaucracy	55.8
Seed	44.2
Marketing (sales)	32.6
Unrefined oil	23.3
Other materials (packaging, chemicals, etc)	9.3
Unbranded sales	4.6

Table 7. Pricing System

Pricing system	%
According to cost	62.8
According to competition	13.7
According to demand	5.9
Price + competition	17.6
Total	100.0

#### Promotion and Brand Name

It has been established that small firms in the vegetable oil sector do not practice consumer oriented promotion activities. The most important reasons for this are their inability to regularly supply the market with goods, and problems with the quality of the product, as well as lack of finances. This type of firm generally sells on a personal basis, selling to local grocers and supermarkets at advantageous prices. The remainder of the product is sold, through personal contact, to middlemen (wholesalers, brokers, etc). According to the survey, only 20.6% carry out advertising or special offers (Table 8).

The Table 8 shows that 60.6% of the firms use a single brand. The most important reason for this is the small size of the firms. As these firms are generally local based, they usually do not vary the products or brands. In the questionnaire, when asked if they had qualified marketing staff, 62.2% replied positively. The remainder works directly only with middlemen (go-betweens).

The percentage of firms carrying out market research is only 26.3%. This low figure results from the firms' structure. It is quite normal for poorer small and medium sized firms to leave

the marketing to the middlemen and wholesalers.

#### Distribution Systems

Vegetable oil producing firms usually use wholesalers, brokers and distributors to distribute their products to consumers. Relatively few firms work directly with wholesalers. A significant proportion of the firms, due to their weak financial position, is unable to set up distribution networks, and is therefore forced to work with wholesalers or brokers. This problem was also noted in the study carried out by Aksoy et al (1996a).

Today, the rental, special offers, in-store advertising and sales prices necessary to work directly with modern retailers represent a large financial burden for small and medium-sized firms. Another factor limiting their access to modern retailers is that the firms are not well known to consumers and do not possess the necessary quality documents. The Table 9 illustrate that the 39.5% of the firms sell their products in all regions, while wholesalers tend to work on a regional basis. The Anatolian and Black Sea regions are generally dominated by small firms, due to the low purchasing ability and awareness of the consumers in these regions.

#### **Discussion**

The various problems experienced by the vegetable oil sector hinder its development. The

main problem is the lack and low quality of raw materials. The sector works at low capacity as a

Table 8. Promotion Activities

Method of Promotion	%
personal selling	64.7
Advertising + promotion	20.6
Advertising	14.7

Number of Brand Names	%
One	60.6
Two	26.3
Three	10.5

Table 9. Distribution Channels by Region

Distribution channels	%	Regions	%
Factory-Wholesaler-Retailer or Factory-Retailer	39.2	Turkey	39.5
Factory-Wholesaler-Retailer	17.4	Anatolia	15.8
Factory-Middlemen-Wholesaler-Retailer	13.1	Thrace +Istanbul	13.2
Distributor	10.9	Anatolia + Black Sea	13.2
Factory-Retailer	2.2	Istanbul + Export	10.5
		Marmara Region	7.8

result of the lack of raw materials. The fact that oil seed producing plants, in particular, are less profitable than alternative products means that there has been a decrease in their cultivation and production. In Marmara region, fields previously used for growing sunflowers have increasingly been replanted with more profitable field and vegetable crops, particularly wheat. This figure must be urgently taken into consideration and predetermined by agricultural policy makers. The history of the American Soybean Association shows that how the oil seeds are of great importance for agricultural sector (Schmid and Soroko, 1997).

The expected increase in the cultivation of alternative oil-producing plants has not taken place. For this reason, oil production in Turkey is mainly based on plants with oil-producing seeds, notably sunflower and cotton. Moreover, production of plants which produce high quantities of oil should be encouraged, and pricing should be based on the oil content of the product.

Sunflower seed produced in Turkey is stored on soil without first washing and cleaning them or ridding them of foreign matter (Aksoy et al., 1996b). Modern storage methods are generally used by the few large firms. Badly stored seed tend to rot and become acidic quickly due to breakages in the seed and foreign matter. The quality of the unrefined oils obtained from these seeds is also problematic. For this reason, correct storage of the sunflower seed after cleaning is important in order to produce quality unrefined materials.

The long standing high customs levies and funds imposed with the aim of protecting the

producer has been only beneficial to agricultural sales co-operatives. In contrast, it has not contributed to a real increase in producers' incomes. Industrial firms unable to find unrefined materials as a result of high customs levels have been reduced to working at 50% capacity. Meanwhile, national firms producing for the international market have been unable to compete on foreign markets due to the high production costs of refined oil.

Although the lowering of customs levies has not had the expected effect on exports, it has contributed to a lowering of national prices. It is hoped that the decrease in oil prices will help consumers' currently insufficient oil consumption to increase.

One of the most important obstacles against the development of the sector is the high inflation and interest rates. It is difficult for firms to pay off the credit that they need to borrow. For this reason, Turkey's macroeconomic problems also have an important influence on the vegetable oil sector.

Firms in the vegetable oil sector need short-term finance in the months (October-November-December) when the purchase of seed is at its paramount. Companies try to satisfy their needs for finance with high-interest bank-loans. However, the high interest rates have a negative effect on these firms' profitability. The fact that the prices of electricity and gas are above world levels also has a negative effect on the firms' profitability.

The storage of sunflower seed, one of the oil seed produced in Turkey, is very problematic. While the quantity of seed produced varies from year to year, around 60%

are bought by Trakyabirlik Agricultural Sales Cooperative. Trakyabirlik buys an average of 300-500 thousand tons of sunflowers per year, but can only store around 50 thousand tons under suitable conditions. The remainder, some of which is processed by the co-operative's own factories while the rest is sold to other oil factories, is stored underground under primitive conditions. This causes quality losses in the product and is even more seen in the years when import prices are attractive. This is due to the fact that the product bought by Trakyabirlik is more expensive than imported products.

In order to solve the problem, storage space belonging to the private sector should be more effectively used in harvest time. The reconstruction of the support purchasing system could be a solution (Gaytancıoğlu et al., 1999). Moreover, product wastage should be prevented by establishing high tonnage steel silos in the large purchasing centers (Tekirdağ, Edirne, Kırklareli)

There are around 150 vegetable oil businesses, of small, medium and large size in the sector. Around half of these are small and they work only 1-2 months in a year, at harvest time. These firms are generally active in other sectors such as flour, husk rice, animal feed, milk, as well as producing vegetable oil.

The smaller firms are generally not productive. The main reasons are the lack of unrefined materials and insufficient finance. The lack of specialization decreases the productivity motivation of the firms and prevents technological innovations. This causes difficulty in competing with larger firms and raising unit price. For this reason, small firms resort to black-market methods such as selling and purchasing without invoice in order to survive.

Larger and medium-sized firms should follow technology closely and invest in it. It is expected that medium-sized and large firms, which also benefit from economies of scale, that invest in technology in the long term, will remain in the market and will contribute to the reduction of the unrecorded economy and the removal of small firms.

In order to increase the production of oil seeds, it is important that these plants bring in more income than alternative crops. For this reason, 500 million dollars will be made available in order to supply the bonus currently

paid to oil seed producers, purchase guarantees and the unrefined materials required by the sector. This will help the state to set rid itself of its economic burden caused by the production of crops such as sugar beet or tobacco due to marketing problems, and promote an increase in producers' incomes.

After the harvest of oil seed, they should be cleaned and stored in modern silos. Therefore, the TMO, cooperatives and organizations, after collecting the product from the producers, should clean and store it. The producer should be able to sell the documents obtained from these organizations showing the amount of product due on the stock exchange or other markets. If these conditions are fulfilled, the industry will be supplied with the clean and high-quality unrefined materials it needs.

The most important problem in unrefined oil is the high acidity and the sediment due to the unrefined seed and technology used. In order to avoid this, clean, high quality oil seed and high technology should be used. In the sector, small firms tend to produce unrefined oil, which is then processed by larger firms. However, in recent years larger firms have been producing the unrefined oil they need for themselves. In addition, unrefined oil is also imported.

Although Turkey is capable of producing more oil seeds, it does not make enough use of this potential. In order to satisfy the needs for unrefined materials nationally, the sector must plan the production of oil seed producing plants and emphasize the production of cotton seed and soy bean as well as sunflowers. Of the oil seed producing plants, sunflowers can be grown in Trakya and the Black Sea region, soy bean in South East Anatolia and cotton seed in the Trakya, South East Anatolia and Aegean regions.

It appears possible to develop the policies necessary to enable the vegetable oil industry to use its seed breaking, unrefined oil and margarine processing capacity, and for unrefined material needs to be supplied nationally. In addition, the target is to increase producer incomes and to provide consumers with good quality, economically priced vegetable oil. In order to achieve this, carrying out multi-faceted policies will help to solve the sector's problems. Oil seed producers should support same as USA and EC.



When consumer behavior is taken into account, liquid oil and margarine consumption is most widespread in the Marmara, Aegean, Black Sea, Central Anatolia and Mediterranean regions. While olive oil is preferred in the Aegean and cotton oil in the Mediterranean and Black Sea regions, there is more preference for margarine type solid fats in the East and South East Anatolia regions. However, throughout Turkey, there is a tendency towards an increase in consumption of liquid oils.

In spite of the various problems faced by the sector, the fact that many firms sell under several brand names has brought about intense competition in the sector. In addition to competition between brand names, competition inside the sales channel has also appeared. In order to survive, it is necessary for firms to adopt consumer-oriented marketing strategies and cooperate with the wholesalers with which they work. It now seems impossible for firms which do not work with modern wholesalers to grow and develop their market share.

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