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Sengul S., Emeksiz F.

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Potential almond production and development possibility of domestic consumption and export in Turkey

S. Sengül and F. Emeksiz
Department of Agricultural Economics, Agricultural Faculty, Çukurova University, 01330 Adana, Turkey

SUMMARY – Almond production in Turkey fluctuated between 32,000 to 48,000 metric tons in the 1980-1998 period, and it was 34,000 metric tons in 1998. Production still has not realized the desired levels although Turkey has the right ecological conditions. Production under dry conditions and the lack of mass plantations are the two main reasons for this shortcoming. Almost all of the produced almonds are consumed domestically. Despite the fast growth rate in the world markets, Turkey's almond export is growing very slowly and it is very unstable. In this study, almond production, consumption and export potential of Turkey are estimated, and the almond sector is analysed using the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis technique.

Key words: Almond, Turkey, production, consumption, export potential, SWOT analysis.

RESUME – *"Production potentielle d'amandes et possibilité de développement de la consommation intérieure et de l'exportation en Turquie". La production d'amandes en Turquie a montré des fluctuations entre 32 000 à 48 000 tonnes entre 1980 et 1998, (34 000 tonnes en 1998). Bien que la Turquie ait de bonnes conditions écologiques, la production n'a toujours pas atteint le niveau désiré. La production dans des conditions sèches et le manque de plantation en masse sont les deux raisons principales de cette lacune. La presque totalité de la production est consommée à l'intérieur, malgré la vitesse de croissance rapide sur le marché mondial ; l'exportation de l'amande de la Turquie croît très lentement et instablement. Dans cette étude, la production d'amandes, la consommation et le potentiel d'exportation de la Turquie sont estimés, et le secteur des amandes est analysé en utilisant la technique d'analyse de SWOT.*

Mots-clés : *Amande, potentiel d'exportation, potentiel de production, potentiel de consommation, analyse SWOT.*

Introduction

The world nut market has showed significant development in the last decade, however, the increase in other agricultural products are very low. Nuts have been cultivated in the Mediterranean Countries for centuries and they are of great economic significance (Albisu, 1995). They have been traditionally consumed in all Mediterranean countries as a component of the typical Mediterranean diet, but are also imported by Europe. The almond production in Turkey ranks forth in nut production. Although Turkey has favorable climatic and ecological conditions, the almond production has not reached the expected levels when compared to the other Mediterranean countries.

The main objectives of this study are to examine development of the almond market, to estimate increases in Turkish almond production, domestic consumption and exportable amount of almond in the future, to determine strengths and weaknesses of Turkey's domestic almond market, and to analyze opportunities and threats in the external markets.

Materials and methods

The sources of data are taken mainly from FAO electronic databases. Also, Turkish and other international publications were used.

Turkey's estimated almond production between 2000 and 2005 is based on the production during the 1980-1996 period. In this study, two kinds of functional forms have been adopted; logarithmic and linear. Tests showed that linear form was the best fit. Therefore, the linear form was used for the estimation. The almond production in Turkey was low in the 1997 and 1998 due to adverse climatic conditions. Therefore, these extreme values were excluded.

Domestic consumption data based on household surveys and industrial use data are not available in Turkey. Therefore, domestic consumption for the 1993-1997 period is calculated by subtracting the average of total exports from the total average production. The population increase is expected to play a major role in the domestic consumption increases (neglecting factors such as income, price, consumer preferences, etc.). The rate of population growth has been 1.508% during 1990-1997 (SIS, 1999a). This data is used to estimate the 2000-2005 consumption. In addition, by subtracting estimated domestic consumption from estimated total production, total potential export volume was estimated.

SWOT analyses techniques were used for analyzing Turkish almond sector and to show the strengths, weaknesses, opportunities and threats from the production phase to the marketing phase.

World production and development of almond

World almond production has steadily increased from 1980 to 1998. In this period, almond production has increased by 45.1% and went up to from 919,620 metric tons in 1980 to 1,334,442 metric tons in 1998 (Table 1).

United States, especially California has been the dominant producer of almonds producing 30% of world production. The decisions made by the California Almond Industry have a major influence on the world almond prices and supplies in other countries. The Mediterranean region accounts for around 35% of world production. Spain is the leading producer in the Mediterranean region, and also the second largest producer in the world between 15% and 25% of the world production. Italy accounted for around 6.6% of world almond production in the 1998, but its production share is constantly decreasing. The other producer countries are Iran, Morocco, Greece, Syria, Tunisia, Pakistan and Turkey. Turkey's share is around 2.5% in 1998 and is lower than other producer countries except for Greece (Table 1).

Table 1. Almonds production in the main producing countries (metric tons) (Source: FAO web page)

Year	USA	Spain	Italy	Iran	Moroc.	Greece	Syria	Pakistan	Turkey	Tunisia	Other	World
1980	239,858	225,300	155,600	50,000	30,000	41,000	10,691	23,600	32,000	37,000	74,571	919,620
1981	303,361	307,300	266,500	42,203	59,500	73,181	8,223	21,170	32,000	35,000	90,902	1,239,340
1982	257,200	215,300	115,000	57,457	57,000	49,231	8,771	23,293	38,000	30,000	199,728	1,050,980
1983	180,000	165,800	127,200	62,115	15,250	59,231	27,200	27,073	41,000	37,000	108,521	850,390
1984	439,000	236,090	100,200	68,889	37,900	53,688	29,100	28,000	33,000	42,000	108,653	1,176,520
1985	352,000	287,200	105,650	59,507	30,500	57,168	33,829	28,500	38,000	51,000	104,876	1,148,230
1986	189,400	221,400	122,700	74,793	35,250	51,823	53,200	29,200	40,000	42,000	126,804	986,570
1987	500,000	250,000	121,790	63,247	31,400	34,186	15,101	29,300	33,000	46,000	130,196	1,254,220
1988	446,900	169,700	114,400	64,196	37,000	62,213	22,800	29,800	42,000	30,000	127,581	1,146,590
1989	371,200	324,500	97,800	66,552	55,600	62,677	37,300	30,100	46,000	35,000	156,371	1,283,100
1990	499,800	250,200	94,970	69,870	57,700	53,390	12,500	30,900	46,000	52,200	153,270	1,320,800
1991	371,200	257,800	126,440	65,544	70,000	56,185	31,500	32,400	46,000	40,000	162,301	1,259,370
1992	412,200	281,900	99,013	72,213	55,000	61,869	30,800	38,304	47,000	45,000	157,113	1,300,412
1993	363,800	280,035	99,106	84,397	47,000	57,220	27,600	40,043	48,000	47,000	168,904	1,263,105
1994	530,000	238,200	89,944	70,000	30,700	55,677	27,885	45,193	47,000	52,000	157,696	1,344,295
1995	276,000	158,900	90,284	79,531	45,700	57,575	33,700	48,996	37,000	35,000	171,965	1,034,651
1996	385,500	242,300	84,140	91,129	33,600	42,626	55,000	49,356	43,000	42,000	197,609	1,266,260
1997	574,000	366,800	104,678	76,000	86,800	43,224	26,341	48,990	33,000	51,000	213,983	1,624,816
1998	393,000	217,000	87,958	76,000	65,700	34,763	66,691	48,990	34,000	58,700	251,640	1,334,442
%	29.4	16.3	6.6	5.7	4.9	2.6	5.0	3.7	2.5	4.4	18.9	100.0

Production and potential almond production in Turkey

Almond production, which is concentrated mainly in the Aegean and Mediterranean region of Turkey (SIS, 1998) is shown Table 2. Total production, which was 32,000 metric tons in 1980, fluctuated until 1993 and reached a maximum level of 48,000 metric tons in 1993. After 1993, production started declining and was 34,000 metric tons in 1998. The total number of trees did not show significant changes between 1980 and 1990, but started declining thereafter, due to lack of new plantations (Table 2). It is noted that the number of non bearing trees are steadily decreasing.

Table 2. Almonds production and number of trees in Turkey (Source: FAO web page; SIS. 1999b. *The summary of agricultural statistics 1997,* Ankara)

Years	Production (metric tons)	Index	Number of trees (000)			
			Fruit bearing	Non- fruit bearing	Total	Index
1980	32,000	100.0	3850	900	4750	100.0
1981	32,000	100.0	3825	850	4675	98.4
1982	38,000	118.8	3800	800	4600	98.4
1983	41,000	128.1	3900	810	4710	102.4
1984	33,000	103.1	3900	810	4710	100.0
1985	38,000	118.8	3950	800	4750	100.8
1986	40,000	125.0	4040	840	4880	102.7
1987	33,000	103.1	4054	761	4815	98.7
1988	42,000	131.3	4034	735	4769	99.0
1989	46,000	143.8	4040	752	4792	100.5
1990	46,000	143.8	4040	775	4815	100.5
1991	46,000	143.8	4019	755	4774	99.1
1992	47,000	146.9	3980	747	4727	99.0
1993	48,000	150.0	3965	730	4695	99.3
1994	47,000	146.9	3906	723	4629	98.6
1995	37,000	115.6	3865	700	4565	98.6
1996	43,000	134.4	3825	677	4502	98.6
1997	33,000	103.1	3775	640	4415	98.1
1998	34,000	106.3	-	-	-	-

The estimated almond production, based on the 1980-1996 data is given in Table 3. Taking 1996 as a base year, Turkish almond production is estimated to reach 45,654 metric tons with an 6.2% increase in 2000, to 48,539 metric tons with an increase of 12.9% in 2005.

Table 3. Almond production prediction in Turkey (metric tons)

Years	Production†	Index
1996	43,000	100.0
2000	45,654	106.2
2005	48,539	112.9

†Y = 33,536.7 + 577X.

World almond trade and its growth

World almond export has increased two times during 1980-1997 period and has reached from 105,616 metric tons in 1980 to 216,286 metric tons in 1997. United States is the largest exporter as well as producer. Its share in total world export market varied between 45.7% and 83.1% during the 1980-1997 period, and was a 70.3% in 1997. Spain was the second largest exporter in 1997 contributing by 20.4%. Turkey's export at 250 metric tons is very insignificant when compared to others (Table 4).

The European Union is the main importer with more than 50% of total world almond imports. Germany accounts for 27% of world imports in 1997 and is followed by France and Japan. Italy, which was net exporter until the early 1980's, is now a net importer (Table 5).

Table 4. Almonds (shelled) exports by the main exporting countries (metric tons) (Source: FAO web page)

Years	USA	Spain	Italy	Greece	Turkey	Other	World
1980	80,974	15,300	3,463	261	0	5,618	105,616
1981	70,335	17,476	7,004	654	142	8,310	103,921
1982	67,260	32,349	8,508	4,047	113	6,493	118,770
1983	57,456	41,054	14,739	4,070	217	8,167	125,703
1984	79,140	25,480	10,989	2,072	233	9,983	127,897
1985	129,436	20,825	2,792	3,195	288	8,232	164,768
1986	100,892	24,828	7,499	2,489	903	18,150	154,761
1987	92,843	26,902	3,108	1,691	425	12,787	137,756
1988	141,403	12,647	3,447	1,205	336	11,040	170,078
1989	124,925	25,842	5,238	5,425	532	14,552	176,514
1990	154,341	27,345	1,723	2,921	346	13,968	200,644
1991	114,817	20,800	2,002	1,283	284	13,853	153,039
1992	111,553	27,081	1,964	2,208	108	13,807	156,721
1993	105,799	36,537	4,490	1,737	283	16,052	164,898
1994	141,307	31,535	1,274	590	433	20,300	195,439
1995	226,592	25,903	1,932	1,452	140	18,110	274,129
1996	233,980	29,241	1,106	977	233	24,987	290,524
1997	152,121	44,035	962	874	267	18,027	216,286
%	70.3	20.4	0.5	0.4	0.1	8.3	100.0

Table 5. Almonds (shelled) imports by the main importing countries (metric tons) (Source: FAO web page)

Years	Germany	France	Japan	Italy	UK	Netherl.	Switzerl.	Canada	Denmark	Other	World
1980	35,554	15,744	9,340	5,220	7,966	4,520	6,150	3,785	2,149	28,458	118,886
1981	38,020	16,167	8,742	1,158	8,410	5,308	5,435	4,464	2,140	29,314	119,158
1982	39,815	17,181	13,229	1,813	11,290	5,907	5,751	5,571	2,526	29,731	132,814
1983	40,413	19,293	13,264	1,472	11,625	5,982	6,080	5,733	2,679	30,831	137,372
1984	36,311	15,971	16,032	2,120	10,728	5,570	5,707	5,440	2,544	40,058	140,481
1985	43,380	18,913	16,442	7,994	11,585	6,286	6,545	5,956	2,649	59,516	179,266
1986	47,216	20,577	23,888	4,132	12,672	9,176	7,293	5,596	3,182	46,408	180,140
1987	42,913	17,549	25,960	11,782	9,363	6,748	6,101	5,119	3,094	28,537	157,166
1988	46,759	18,852	24,408	10,594	10,125	7,326	7,510	6,145	2,584	58,742	193,045
1989	46,833	19,314	23,084	8,456	11,189	10,446	7,282	7,246	3,208	47,569	184,627
1990	57,416	20,077	20,508	11,148	12,471	12,624	7,338	7,276	3,622	55,090	207,570
1991	57,851	21,094	22,889	11,789	10,885	11,477	7,502	8,292	5,209	54,431	211,419
1992	57,193	22,494	23,620	9,962	10,913	11,095	7,628	8,511	5,187	61,355	217,958
1993	57,669	20,842	21,623	6,065	8,890	9,814	7,301	8,689	5,836	49,796	196,525
1994	57,485	20,166	18,558	9,440	9,552	11,669	7,705	8,757	4,852	61,758	209,942
1995	55,825	19,505	22,523	6,831	8,981	9,844	7,543	7,228	5,096	70,771	214,147
1996	60,108	19,923	17,933	13,709	9,189	8,675	7,044	6,901	5,429	73,991	222,902
1997	59,777	21,790	18,448	13,995	9,321	8,176	7,490	6,954	5,650	74,189	225,790
%	26.5	9.7	8.2	6.2	4.1	3.6	3.3	3.1	2.5	32.8	100.0

Domestic almond consumption, export, and consumption and export potentials in Turkey

Most of Turkey's almond production is consumed domestically (99.0% of the production during the 1993-1997 period). However, domestic consumption per capita in Turkey is lower than other producer countries. Percapita consumption was 0.5 kilograms in 1997.

Government intervenes in the pistachio and hazelnut prices; however it does not intervene in almond prices. Therefore, almond prices are determined in liberal market conditions (Yavuz,1998).

Turkey started exporting almonds in 1981. Turkey's export which has reached from 142 metric tons in 1981 to 267 metric tons in 1997, is still very negligible (0.1% of world export in 1997). Turkey almond export fluctuates from one year to another. Export has varied from 903 metric tons in 1986 to 108 metric tons in 1992, during the 1980-1997 period. Although Turkey's almond export has increased from US$156,000 to US$1,511,000, it is very low compared to the other producer countries. By comparison, United States'export value has increased by approximately 2 times and has reached from US$334,285,000 in 1980 to US$694,275,000 in 1997. Table 6 shows estimated domestic consumption and export potential in Turkey for 2000 and 2005 years. It is estimated that Turkish domestic consumption will reach 43,088 metric tons in 2000 and 46,436 metric tons in 2005. Nuts, especially almonds have beneficial effects on heart and cardinal vascular diseases (Ekinci, 1997). The generic advertising and promotion activities, which are regularly carried out in USA and European countries, can also be carried out in Turkey for increasing and promoting nut consumption, especially domestic almond consumption. In addition, nuts can be utilized as 500 to 1000 different products in the nut related industry. Nuts, especially almonds are used as a component of turron (spanish sweet) and marzipan, which are consumed intensively during the Christmas holidays. But, industrial use of almond are not at expected levels, even though it has a potential. Measures must be taken to increase the industrial use of almond in Turkey. Processing facilities with modern technologies must be established in the main producing areas. Consumers can be informed about the positive influence of almond on health and nutrition, because these two elements are of most importance for today's consumers.

Table 6. Predicted of almond production, consumption and export potential in Turkey (metric tons)

Years	Production	Domestic consumption	Export†
1996	43,000	42,565	435
2000	45,654	43,088	2566
2005	48,539	46,436	2103

†Shelled and in shell.

Turkish export potential was calculated by subtracting estimated domestic consumption from estimated total production for the 2000 and 2005 years. It is estimated that export potential in Turkey will reach 2566 metric tons and 2103 metric tons in 2000 and 2005, respectively. Potential export is striking when compared to current export. However, current export level is very little considering the potential attainable export level. This fluctuation in numbers is clearly seen when export tables are examined. Export volume in Turkey has changed from 903 metric tons in 1986 to 108 metric tons in 1992. Improvements made in the export market system (in production, processing and marketing phase) will help Turkey increase its share in world markets and export potential. Although Turkey has a high export potential, export share in European markets is not expected to increase because USA and Spain have intensive competition in European market. Spain and Italy have lost export share in European markets due to United States' competition. Italy, which was a net exporter in the beginning of 1980's, but now, is net importer.

Desired Turkish almond export level could be reached by doing research about the product development according to the needs of the target consumer in external markets and developing the marketing strategies in order to enter Central Asia and Eastern European Countries which have similar consumer structures and nutrition habits with Turkey.

It is estimated Turkish almond export will decrease in 2005 compared to 2000's. This is explained by the fact that the domestic consumption increase rate will be higher than production increase rate.

Analysis of Turkey’s almond sector

Turkey's strengths and weakness in almond production and domestic market as well as opportunities and threats in external markets are listed below using SWOT analysis.

Strengths

(i) Almond production in every region of Turkey is possible except the East Black Sea region.

(ii) Almond can be produced economically under irrigated conditions (in Southeastern Anatolia region, for example).

(iii) There is no labor shortage labor fees are relatively cheap.

(iv) Internal almond prices and price elasticity are high. By increasing production, prices can come down resulting in higher demand.

Weaknesses

(i) Cold requirements for almonds are rather low; therefore almonds can be grown risk free in only limited areas due to spring frost.

(ii) Plantation type production is very limited. Most of the production is carried under dry conditions in personal gardens or as border crops.

(iii) Turkish almond-production per area is relatively low compared to other producer countries due to lack of water, fertilizer (in 1998, almond yield of the USA is 22,849 kg/ha, Spain; 37,575 kg/ha, and Turkey; 17,895 kg/ha.).

(iv) There is no direct producer strategy for the hard-shelled, fruits like almonds at the national level.

(v) Research and development activities for the almond marketing are inadequate.

(vi) The product line is very limited due to lack of development in industrial almond use compared to other producer countries.

(vii) The almond varieties, which are produced in Turkey, are of low quality. Therefore, image of Turkish almond in world‘s markets is very weak.

(viii) Distribution channels and stocking- possibilities of the product are inadequate at the national and international platform.

(ix) Producer organization is either lacking or very weak.

(x) Processing facilities with modern technologies are inadequate.

(xi) There is no clear and stable government policy in both national and international markets.

Opportunities

(i) Liberalization of international commerce with GATT.

(ii) Turkey's convenient location to those potential buyer-countries such as Central Asian countries and Eastern European countries.

(iii) Hard-shelled fruits' market is one of the fastest growing markets.

(iv) Nuts (almond) have positive effect s on heart and cardiac vascular diseases.

Threats

(i) Disadvantages exist compared with other countries in production techniques and variety.

(ii) There is not an efficient international marketing organization.

(iii) A few exporting-organizations have been working independently without proper cooperation.

(iv) Exporting-organizations are unable to collect satisfactory and rapid information about international markets, and their spending on research and development about foreign markets is very limited.

(v) Only few exporting-organizations are managed by experts, although marketing abroad is an activity that certainly needs specialization.

(vi) There is too much bureaucracy in exporting.

(vii) Consumer tastes and preferences towards processed products are constantly changing in international markets.

(viii) Competition in international markets is continuously increasing.

(ix) Economic crises often occur in Turkey.

Conclusion

Turkish almond production has not reached the desired levels due to lack of water and use of inadequate techniques. However, the projections in this study clearly show that potential production and export are well above the current levels. SWOT analysis show that Turkish almond exports could considerably be increased when compared to actual export levels. Desired production, consumption and export levels of Turkish almond could only be reached by taking preventive measures that will eliminate the weakness and threats, and by taking into account the opportunities and strengths.

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