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Determining production and export potential of pistachio in Turkey

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SUMMARY – Pistachio production in Turkey has increased in the last 20 years. Increases in both the numbers of trees and yield per tree have both contributed to this increase. Production is expected to expand in the coming years. Turkey's pistachio export has not reached the desired levels despite the fast expansion in world pistachio trade volume. This study was undertaken to predict the potential Turkish pistachio production and export. The SWOT analysis was used to analyse the pistachio sector.

Key words: Pistachio, Turkey, export potential, production potential, SWOT analysis.

RESUME – "Détermination du potentiel de production et d'exportation de pistaches de la Turquie". La production de pistaches en Turquie a augmenté ces 20 dernières années. Cette augmentation est influencée aussi bien par le nombre d'arbres que le rendement par arbre. La tendance trend montre que la production va continuer à augmenter dans les années prochaines. Malgré l'expansion rapide en volume des échanges mondiaux, l'exportation de la Turquie n'a pas atteint le niveau désiré. Cette étude a pour but de prévoir le potentiel de production et d'exportation de pistaches de la Turquie. L'analyse de SWOT (Forces, Faiblesses, Occasions, Menaces) a été utilisée pour analyser le secteur des pistaches.

Mots-clés : Pistache, Turquie, potentiel d'exportation, potentiel de production, analyse de SWOT.

Introduction

Turkey is a major producer of nuts in the world. The main nut is hazelnut, followed by pistachio. The pistachio production has increased considerably due to new plantations and yield increases since the 1980's. The production is expected to increase further since Southeastern Anatolia Project (SAP) will increase the irrigated acreage considerably.

Historically, Iran has had a supply side advantage and continues to retain it. At the same time, United States which was a net importer of pistachios until recently is now a net exporter, leading to a strong competition in the world pistachio market. But, Turkish pistachio exports have not reached the desired levels despite increased pistachio production in Turkey, and development of world pistachio markets.

The objectives of this study are to estimate increases in Turkish pistachio production and exports in the coming years, to understand structure and trends in world pistachio trade to evaluate the strength and weakness of Turkey's production and domestic pistachio market, and threats and opportunities in the external pistachio 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 pistachio production between 2000 and 2005 is based on the production during the 1980-1998 period. This trend analysis is based on a two year moving average considering that pistachio crop yield every alternate every year due to periodicity. 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 prediction.

For the period 2000-2005, Turkish export potential was computed by subtracting estimated domestic consumption from estimated total production. Domestic consumption data based on household surveys and industrial use data are not available in Turkey. Therefore, domestic consumption for the eight year period 1990-97 is calculated by subtracting the average of total exports from the total average production. The domestic consumption for the 2000-2005 period is predicted by using the average of 1990-97. 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% (SIS, 1999a) during 1990-1997. This data is used to estimate the 2000-2005 consumption. SWOT analyses techniques were used for analysing Turkish pistachio sector and to show the strengths, weaknesses, opportunities and threats from the production phase to the marketing phase.

World production and development of pistachio

World pistachio production has steadily increased from 1980 to 1998. During this period, production has increased 4.3 times; that is from 76,029 metric tons in 1980 to 328,185 metric tons in 1998.

Iran is the leading country in production with a production range between 34% and 61%. Recently USA, Turkey and Syria follow Iran. By 1998, USA, Turkey and Syria have contributed to the world production by 26.7%, 12.2% and 11.1%, respectively. In other words, 90% of world pistachio production come from these four countries (Table 1).

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

Years	Iran	Turkey	USA	China	Syria	Greece	Other	World
1980	23,000	7,500	12,247	18,000	7,800	2,514	4,954	76,029
1981	122,100	25,000	6,620	18,500	9,100	2,253	4,534	188,200
1982	96,100	13,000	19,685	19,000	8,000	2,150	3,611	161,571
1983	119,600	25,000	11,975	20,000	9,200	3,269	4,246	193,320
1984	93,800	23,000	28,620	18,000	10,800	3,600	3,547	181,400
1985	104,600	35,000	12,290	19,000	12,028	4,067	4,582	191,627
1986	97,600	30,000	33,970	21,000	14,300	3,670	3,219	203,779
1987	113,600	30,000	15,000	22,000	12,474	4,348	5,480	202,992
1988	126,200	15,000	42,600	20,000	17,900	4,244	2,942	228,966
1989	130,300	40,000	17,690	21,500	15,600	5,551	4,402	235,100
1990	162,800	14,000	54,430	22,000	13,000	3,439	3,435	273,104
1991	182,400	64,000	34,930	23,000	14,400	4,989	5,371	329,110
1992	201,600	29,000	66,680	21,500	20,200	4,786	3,638	347,404
1993	229,300	50,000	68,950	24,000	13,700	5,573	4,901	396,424
1994	195,000	40,000	58,500	25,000	14,925	5,351	3,623	342,399
1995	238,700	36,000	67,130	25,000	14,538	5,591	5,285	392,327
1996	260,000	60,000	47,630	25,000	24,324	4,500	6,280	427,814
1997	111,900	70,000	81,650	28,000	29,428	3,600	8,328	332,926
1998	130,000	40,000	85,280	28,000	36,437	5,000	3,468	328,185
%	39.6	12.2	26.0	8.5	11.1	1.5	1.1	100.0

The production and potential pistachio production in Turkey

Pistachio production, in Turkey, has increased by five times from 1980 to 1998 due to increases in production acreage and yield. Production has reached 40,000 metric tons in 1998 while it was only

7500 metric ton in 1980; and it has reached the highest level of 70,000 metric tons in 1997 (Table 2). Pistachio production is concentrated mainly in the southeastern Anatolia and Mediterranean region (SIS, 1998).

Table 2. Pistachios production and number of trees in Turkey.
Sources: FAO web page; SIS (1999b)

Years	Production (ton)	Index	Number of trees (000)			
			Fruit bearing	Index	Non-fruit bearing	Index
1980	7,500	100.0	16,150	100.0	12,000	100.0
1981	25,000	333.3	17,400	107.7	11,500	95.8
1982	13,000	173.3	17,400	107.7	12,930	107.8
1983	25,000	333.3	17,400	107.7	12,830	106.9
1984	23,000	306.7	17,600	109.0	13,000	108.3
1985	35,000	466.7	18,100	112.1	13,395	111.6
1986	30,000	400.0	18,640	115.4	12,670	105.6
1987	30,000	400.0	18,977	117.5	13,715	114.3
1988	15,000	200.0	19,343	119.8	14,034	117.0
1989	40,000	533.3	20,067	124.3	16,940	141.2
1990	14,000	186.7	20,385	126.2	17,033	141.9
1991	64,000	853.3	21,080	130.5	15,793	131.6
1992	29,000	386.7	22,000	136.2	16,600	138.3
1993	50,000	666.7	22,948	142.1	17,883	149.0
1994	40,000	533.3	23,340	144.5	18,349	152.9
1995	36,000	480.0	23,850	147.7	18,910	157.6
1996	60,000	800.0	24,480	151.6	19,600	163.3
1997	70,000	933.3	25,340	156.9	19,200	160.0
1998	40,000	533.3	—	—	—	—

Table 3 shows the predicted future pistachio production for Turkey, which is based on the 1980-1998 data. Taking 1997-98 as a base year, Turkish pistachio production is estimated to reach 58,483 metric tons with an increase of 6.3% in 2000, and to 69,857 metric tons with an increase of 27% in 2005. Anticipated production increase is attributed to increased acreage (number of trees) and yield increases. The most important factor that will contribute to production increase is the implementation of irrigation by the SAP, which is carried out in the main pistachio growing area. One other factor is the expected production from trees, which are non-bearing at the moment, or the very young trees, which still are not fully productive.

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

Years	Production ^{†††}	Index
1997-1998	55000	100.0
2000-2001	58483	106.3
2004-2005	69857	127.0

[†]Two years average.

^{††} $Y = 12986.9 + 2274.8X$; $R^2 = 0.82$.

World pistachio trade and its growth

World pistachio export has increased steadily during 1980-1997 period. During this period, pistachio export has risen from 5660 metric tons in 1980 to 148,481 metric tons in 1998. Iran is the largest producer and exporter and it contributes to 52.5% of the world's pistachio exports. The United States (7.6%) and Syria (7.0%) follow Iran's export volume. Turkey has relatively a low level export compared to the other producer countries. Some other countries such as Germany, Belgium-Luxembourg and UK import pistachio to re-export it to other countries after processing it. Germany, for example, contributes 11.4% of world pistachio export by the re-exporting process (Table 4).

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

Years	Iran	USA	Germany	Turkey	Syria	Other	World
1980	3,896	0	61	923	1	779	5,660
1981	4,500	0	410	2,349	1	919	8,169
1982	4,000	1,401	161	2,700	0	669	8,871
1983	5,000	1,728	442	1,346	0	735	9,251
1984	7,152	1,184	480	2,103	1	1,136	12,957
1985	18,227	1,330	1,330	6,732	0	1,165	28,784
1986	42,113	3,108	2,165	5,404	3	1,605	54,338
1987	53,825	3,293	5,263	2,688	36	4,335	69,440
1988	53,696	2,809	5,465	5,662	105	9,101	76,838
1989	68,849	5,097	5,427	4,013	513	10,049	93,948
1990	68,655	4,227	6,302	2,291	1,398	8,989	91,862
1991	97,387	6,470	5,996	655	4,211	13,055	127,774
1992	104,206	15,971	6,870	1,037	2,121	19,696	149,901
1993	117,864	12,995	12,392	372	9,828	18,077	171,528
1994	110,821	14,820	16,471	763	6,669	25,812	175,356
1995	110,821	15,011	12,165	1,669	3,868	29,159	172,693
1996	103,000	10,913	23,186	1,253	10,352	25,293	173,997
1997	78,000	11,240	16,900	4,327	10,352	27,662	148,481
%	52.5	7.6	11.4	2.9	7.0	18.6	100.0

World's pistachio import demand is mainly by the European countries. More than half of the world pistachio export goes to northwestern European countries. In 1997, Germany was the leading country in importing pistachios with a share of 27.4%. Germany is followed by Italy (7.6%), Russia (7.2%), France (6.4%), Spain (5.0%), Belgium-Luxembourg (4.1%) and China (6.0%) (Table 5).

Turkey's pistachio export and export potential

Most of Turkey's pistachio production is consumed domestically. In the 1990-1997 period, 97% of the production is internally consumed. Internal consumption is mostly fresh and dry consumption, and industrial use is very limited. Private companies play important role in the internal marketing.

Pistachio is sometimes purchased by the Southeast Agricultural Sale Cooperatives at support price level in the name of state but recently they have started buying pistachio for themselves (Yavuz, 1998).

Turkey pistachio export fluctuates from one year to another. Export has varied from 6,732 metric tons in 1985 to 372 metric tons in 1993 (Table 4), during the 1980-1997 period.

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

Years	Germany	Italy	Russ. Fed.	France	Spain	Bel-Lux	China	Japan	UK	Other	World
1980	2,466	114		784	0	577	0	0	98	5,661	9,532
1981	1,679	162		771	215	58	0	0	109	8,863	11,604
1982	1,850	73		813	272	225	0	286	218	9,054	12,661
1983	2,305	117		877	324	279	0	460	343	8,651	13,549
1984	2,278	101		693	462	490	0	470	312	15,867	20,003
1985	4,243	192		883	5,035	1,068	0	753	609	20,093	32,874
1986	11,902	405		1,293	6,140	1,583	0	766	892	15,160	38,681
1987	19,037	3,688		2,935	9,369	2,832	413	2,739	3,992	11,636	56,001
1988	23,626	4,925		3,352	7,675	4,406	1,435	7,103	2,986	21,653	77,531
1989	24,141	6,259		3,982	7,844	3,856	1,610	6,487	3,540	26,255	83,918
1990	26,377	6,554		5,255	7,887	4,636	1,560	5,391	4,881	27,672	90,583
1991	39,167	8,534		8,839	10,403	6,396	1,911	9,489	5,755	40,374	130,868
1992	44,489	9,294	5	10,061	10,539	8,000	6,969	7,646	7,182	43,030	147,215
1993	38,184	10,685	37	10,701	10,193	5,066	9,866	6,677	8,889	47,784	148,082
1994	43,866	14,237	3,358	13,240	11,159	8,073	9,512	7,687	7,468	60,355	178,955
1995	40,859	13,381	10,240	10,165	10,498	10,527	7,183	8,565	9,883	50,811	172,112
1996	46,893	14,953	12,487	11,967	11,311	9,786	9,621	6,984	2,760	63,411	190,173
1997	47,494	13,164	12,487	11,138	8,593	7,075	10,355	5,124	4,471	53,385	173,286
%	27.4	7.6	7.2	6.4	5.0	4.1	6.0	3.0	2.5	30.8	100.0

Even though Turkey's pistachio export shares in world trade ranged from 15% to 30% during the first half of 1980's, this share has decreased considerably since 1986. Turkey's total pistachio export share is 0.7% and 2.9% in 1996 and 1997, respectively. During the 1980-1997 period, Turkey's pistachio export value has increased from \$7,086,000 to \$17,794,000. However, during the same period, Iran and USA have increased their export value from \$15,000,000 to \$321,000,000 and \$6,829,000 to \$50,614,000, respectively.

Table 6 shows Turkey's export potential during the period from 2000 to 2005. It is estimated that this potential will reach 12,641 and 20,453 metric tons in years 2000 and 2005, respectively. Turkey's pistachio-export in year 2000 will increase by 3 folds, and by 5 folds in 2005 compared to its 1997 export. Potential export is striking when compared to actual export. However, actual export level is very little considering the potential attainable export level. This fluctuation in numbers is clearly seen when export tables are analysed. 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. Desired export levels of Turkish pistachios could be reached by doing research about the product development, by integrating with the international market organizations, and by advertisement. Efforts should be aimed at those marketing practices that promote Turkish pistachios in importing-countries In order to reach this goal. The Turkish pistachio sector must take measures that will take responsibility of the product right from the growing phase to export phase. Turkish pistachios are exported loose in 70-80 kilogram-bags are re-standardised in the importing countries and sold to consumers at a premium price in smaller quantities using foreign brand names. This situation causes value-added transfers from Turkey to importing countries at a rate almost as high as 80 percent (Ulusoy, 1990). Therefore, there is an urgent need for developing the product that meets the needs of target customers in foreign markets, and instead of exporting pistachios loose in large quantities, smaller consumer packages should be used.

Table 6. The prediction of pistachio export potential in Turkey (metric tons)

Years	Export	Index
1997	4,327	100.0
2000	12,641	292.1
2005	20,453	472.7

Analysis of Turkey's pistachio sector

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

Strengths

(i) Turkey is the third largest pistachio producer country in the world. Its contribution to the world's pistachio production is approximately 12%.

(ii) This increasing trend in production can be maintained by switching the pistachio farming to those areas that will have better irrigation systems within the framework of SAP. The United States, which once was a net importer, became the second biggest producer country since 1960's after Iran. In addition, USA is the second leading pistachio exporter. The main reason for this fast growth lies behind the fact that, as opposed to Turkey, United States has high quality trees in irrigated areas, one species with large fruit, good standardization, an effective marketing organization, and a strong producer cooperation.

(iii) Pistachio production may be improved by grafting pistachio-scions on to wild pistachio species commonly found (such as *P. terebinthus* L.) in the wilderness.

(iv) There is no labour shortage in pistachio and production, labour fees are cheaper.

Weaknesses

(i) Turkish pistachio-production per area is relatively low compared to other producer countries due to lack of water (in 1998, pistachio yield of the USA is 3206 kg/ha, Syria 1656 kg/ha, Turkey 1144 kg/ha and Iran 1083 kg/ha).

(ii) There is no direct producer strategy for the hard-shelled fruits like pistachios at the national level.

(iii) Research and development activities for the pistachio marketing are inadequate.

(iv) Marketing possibilities are very low since the product line is very limited.

(v) Image of Turkish pistachio in world's markets is very weak.

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

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

(viii) Processing facilities with modern technologies are inadequate.

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

Opportunities

(i) Liberalization of international commerce for the product.

(ii) Turkey's convenient location to those potential buyer-countries such as Germany, Italy, Russia, and France.

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

Threats

(i) High quality and quantity pistachios that meet the needs of international markets is not available. The main characteristics of Turkish pistachios are: it has green-like collaring inside, has delicious and aromatic taste, with small or medium sized grains, and with limited cracking-ability. Iranian species do not have the natural green-like collaring, are not delicious and do not have the aroma, but they are large grained and easy cracking. The "Kerman" species, which are grown mainly in the United States, has the medium sized grains and has high natural cracking-ability. These species which lack a good taste and aroma but have large grains and high cracking-ability are sold at premium prices.

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

(iii) There is not an efficient working, international marketing organization.

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

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

(vi) Only few exporting organizations are managed by experts even though marketing abroad is an activity that certainly needs specialization.

(vii) There is too much bureaucracy in exporting.

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

(ix) Competition in international markets is continuously increasing.

(x) Often occurring economic crises in Turkey affect the pistachio sector.

Conclusion

Turkish pistachios, having a great production potential in Turkey, have not been able to perform well in terms of quantity, and have not reached a stable export structure due to strong Iranian and American competition. However, the projections in this study clearly show that production and export potential are well above the current levels. SWOT analysis show that Turkish pistachio exports could considerably be increased when compared to actual export levels. However, this goal could only be reached by taking implements that will eliminate the weakness and threats, and by taking preventive measures that will take into account the opportunities and strengths.

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