

## **A Critical Analysis of the Competitiveness of the Iranian Pistachio Industry**

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### **Abstract**

*The pistachio industry has played a major role for the Iranian economy being one of the biggest non-oil exports in the country. However, over the past 15 years, this industry has lost competitiveness against American producers in demanding markets for high quality pistachios. This study focuses on the analysis of the international competitiveness of the Iranian pistachio industry. The research opted for an industry-level case study. In-depth interviews were carried with owner directors and managers from 11 firms across different sectors in the Iranian pistachio industry. In addition, further interviews were conducted with government employees, academic professors engaged with the pistachio industry, and Iranian-Americans pistachio producers in California. This research reveals those factors and areas where adjustment needs to be made to prevent a further erosion of the competitive position of Iranian producers against American producers in the international market.*

**Keywords:** The pistachio industry, competitiveness, international markets, Iran, America

### **1. Introduction**

Before delving into those competitive factors affecting the Iranian pistachio industry, it is relevant to understand the role played by the Iranian government on the national economy. Iran is a country where 50% of the economy is centrally planned. The Iranian government policy affects macroeconomic factors such as unemployment rate, the inflation rate, and the rate of economic growth. Iran's economy relies heavily on oil revenues. This revenue has been used to implement a range of policies. For instance, government subsidies - particularly on food and energy - have influenced the national economy for more than 30 years. Recently, the government decided to reduce subsidies (Majlis.ir, 2010). The cut of subsidies will have a dramatic effect on many Iranian industries. The pistachio industry, as part of this economy, will be affected too. Pistachio is the most important agricultural crop cultivated in Iran's tropic. The pistachio industry is one of the most important non-petroleum industries for the Iranian economy. Pistachio export earnings are the largest among non-petroleum export industries (Karimi, 2008). The pistachio industry has undergone significant change over the past few decades.

Until 1979, the majority of pistachio harvest was exported to the United States. During the eighties, the Iranian pistachio industry faced a 283% tariff to Iranian shippers of raw pistachios and a 318% increase to roasted products (FAS, 2004). Since then, it became not feasible for Iran to export any pistachios to America because of these heavily increased taxes. Moreover, the growth of American pistachios industry consequently led to Iranian pistachios to be replaced by American ones (Abrishami, 1995; Sedaghat, 2006). As result of this, the Iranian pistachio exports shifted to European and Japanese markets. From 1981 to 1991 90,000 tones of pistachio were exported to these markets. In 1991, European countries and Japan imposed new quality standards for Aflatoxin (fungal metabolites exhibiting toxin). As a result of the new regulation, the majority of Iranian pistachios were rejected because they did not meet the new sanitary requirements (Abrishami, 1995; Alavi, 2006). The supply to these two markets was replaced partly by American pistachios and other agricultural snack products. Consequently, once again, Iran had to change their target market and focused on other markets such as China, Russia and South East Asia. At the moment, Iran exports most of its production to these markets.

The world's largest producers and exporters in the pistachio industry are Iran and the United States which, combined produce 80% of the pistachio world production (Abrishami, 1995; KarimKoshteh&Vardan, 2003). For the past twenty years, the competition between Iranian and American pistachios has increased year on year. The pistachio production has increased significantly in recent years in both countries and therefore, they need to identify and develop new markets for their surplus produce. Both countries have different competitive advantages and aim to further increase their international competitiveness by using technical improvements and new marketing strategies (Sedaghat, 2008). However, the pistachio industry in Iran is facing some difficult challenges to improve their productivity and efficiency. Although, Iran continues to be the biggest producer and exporter of pistachios in the world, it has the lowest productivity yield per hectare compared to production efficiency levels achieved by other countries. Iran has increased the total area for pistachio production over the past years but the production efficiency has not improved (KarimKoshteh&Vardan, 2003). Several studies have focused on the comparative advantages of Iranian pistachios. However, there is little research that looked at the influence that key stakeholders, involved in the pistachio value chain, may have on the international competitiveness of the industry. This study will analyse the international competitiveness of the Iranian pistachio industry. This research aims to identify those key factors that may prevent Iranian pistachio firms from competing with American companies on international markets.

## **2. Methods**

A deductive approach was adopted as it was deemed to be the most suitable to achieve the aims of this research. This research selected an industry-level case study research strategy to analyse in depth those factors which have influenced the competitiveness of individual firms within the Iranian pistachio industry. In this study, the semi-structured interview was the major data collection instrument. In depth interviews, was considered the most suitable method to communicate with main actors and to obtain access to the required data to achieve the objectives of this research. A semi-structured approach allowed for expansion upon any interesting information that became apparent during the course of the interview even if it was not covered by the initial interview structure plan. Carrying out a questionnaire was not considered a suitable research method for this study because most people involved in the Iranian pistachio industry are small, low-income farmers, usually living in rural areas with limited access to formal education. Therefore, the chance of receiving a low response or misinterpreting the questions due to poor reading skills was considered high. In this scenario, and to achieve the aim of this research, a personal in-depth interview was considered the most appropriate research tool to gather the required data from key actors within the industry and to unveil the key factors and drivers of competitiveness of the Iranian pistachio industry.

Personal interviews were held with key-decision makers of the eleven firms participating in this research. Most of these firms were located in Kerman, others in Rafsanjan, Tehran, and Yazd. It is important to highlight that 80% of Iranian pistachio production is produced in the provinces of Kerman and Yazd. The selected case studies have different sizes ranging from 10 hectares to 100 hectares. Therefore, it can be inferred that the findings of this study are a fair representation of the current Iranian pistachio sector. A total of twenty eight face to face in-depth interviews were carried out for this research. Six interviews were held with business owner-managers and twelve with managers, technicians and professionals. 'Technicians' in this study will be referring to professionals with a university degree. Ten additional interviews were carried out with three exporters, two brokers, two academic professors from an agriculture University in Kerman and Rafsanjan, two researchers from Iranian Pistachio Research Institute, and one government employee from the Iranian Ministry of Agriculture.

Additional interviews supplemented and improved the validity content of qualitative data. All interviewees had vast experience within the Iranian pistachio industry and had been working in the same area for at least five years. All interviews were conducted during 2011 and lasted about one hour and a half. Some respondents requested to remain anonymous. Therefore, collected primary data presented in the results section will not reveal the names of respondents. They are identified as PI (professional interviewee), OI (owner interviewee), GI (government interviewee), AI (academic interviewee), EI (exporter interviewee), and BI (broker interviewee). It would have been difficult to address the objectives of this research without collecting data from the main competitors. Therefore, further telephone interviews were carried out with five Iranian pistachio farmers who migrated and grow pistachios in California. These interviewees were selected because of their understanding of the pistachio industry both in Iran and America. The analysis of collected data followed a process of three steps involving: interpretation of the data, analysis stage where an 'analysis heading' approach was adopted, and interpretation.

### **3. Results**

#### **3.1 Industry structure**

Prior to discussing the key factors affecting the competitiveness of the Iranian pistachio industry, it is worth first presenting the findings related to relevant changes in industry structure. The structure of the pistachio industry changed radically after 1979. Until then, the main production of pistachios was in the hands of big farmers. In 1980, the government implemented a subsidy scheme to help the development of agriculture products. As part of the scheme, chemical fertilizers, pesticides, agriculture machinery and energy to small farmers were subsidised. Most interviewees believed that the agriculture subsidies had encouraged many small farmers to start producing pistachio. As a result of these subsidies the structure of the pistachio industry changed from one dominated by big farmers towards one dominated by small and medium sized farmers (OI, GI).

Several respondents from different institutions (GI, AI, EI, BI) highlighted the impact that some government measures have had for the competitiveness of the Iranian pistachio industry. In the early eighties the government decided to confiscate and nationalize Morshed Brothers Company. It had been the largest Iranian pistachio exporter for over 35 years. The mismanagement under state ownership caused the company to gradually close their production plants. The government established a new company named Rafsanjan Pistachio Producers Co-operative which went bankrupt five years later. One of the reasons that had driven the company to bankruptcy was the decision to purchase pistachios from farmers at higher prices than the prevailing market prices. The government intended to support farmers with this policy. However, subsidising the price provided no incentives for farmers to develop competitive advantages. This was clearly not a good measure for an industry that relies on the international market.

In 2006, the government established a new company named the Iranian National Pistachio Co. This company also went bankrupt in 2008. The two government companies disrupted the market with unrealistic prices and mismanagement of internal and international markets. When all government companies stopped buying pistachios, private companies expanded their market share, increased their exports and fair competition was re-established (EI). The majority of pistachios are now exported to international markets by private companies. The qualitative data from the interviews indicates that there are three main types of firms within the selected industry. There are production firms or farms, processing plants, and business firms (commissioners, brokers, & exporters). The different types of firms pursue different strategies. Some of them place more emphasis on quality issues while for others the main objective is to compete on price. Interestingly, 76% of pistachio harvest is bought by private non-exporting firms (BI).

All interviewees from the export sector considered that brokers and middlemen are particularly active in the domestic pistachio market. It was noted that small farmers in need of liquidity sell the harvest to these firms which pay in cash and within a period of three months. Occasionally, investors from outside the industry purchase pistachios to sell later in the year (EI). There was much agreement among interviewees on the fact that the European Union ban on Iranian pistachios with high levels of Aflatoxin contamination has encouraged Iranian pistachio producers to improve their quality. Over the last 15 years the knowledge of farmers on Aflatoxin has increased considerably and they have produced cleaner pistachios. The industry has also invested in processing capability and technology. For instance, some firms have machinery with the capacity to process 10 tones of pistachio per hour (BI, GI).

#### **3.2 Competitiveness**

Factor conditions constitute the basic inputs available within a nation (Porter, 1990). This study has looked at the availability of knowledge resources, human resources, physical resources, and infrastructure throughout the Iranian pistachio industry over the last 15 years.

##### **3.1.1 Knowledge resources**

The vast majority of owners and professionals interviewed across the eleven firms stated that they have never been involved in any type of research with either the public or private sector. Only one interviewee, who was a researcher, said to have been involved in research with the Iranian Pistachio Research Institute. The data from the interviews suggests that producers relied mainly on traditional techniques of production which were acquired from previous generations. However, new production techniques have been incorporated to meet the sanitary requirements of pistachio importers. The work of professionals has been key in communicating to other stakeholders the most up-to-date knowledge (OI).

Most interviewees (OI, PI, EI, BI) argued that they did not receive any help from universities or research centres to access the knowledge and skills required to successfully compete in the international arena. Moreover, some believed that a lack of research on the farming system prevented the Iranian pistachio producers from achieving the same levels of production achieved by their competitors in America. One respondent claimed that the government has a research centre that has not had any significant results. According to him, advice from government research institutes is not relevant to the domestic conditions of production. Moreover, there is no department at the Ministry of Agriculture where pistachio companies could address enquiries related to business or technical aspects. This contrast with what happens in America. For example, American research institutions have developed their own rootstocks that have helped the local industry to achieve better harvests. Iran does not have a rootstock adapted to the diverse conditions of pistachio production regions. This imposes a serious constraint on production (OI). A rootstock is a plant or a stump which already has an established healthy root system which is used for grafting a cutting or budding from another plant.

Representatives from the government and academic professors felt that much of the research on pistachio production were ineffective. They alleged that the lack of focus in research, tough budgeting constraints in research, weak promotion of new research, an agriculture system unprepared to use new knowledge, and a shortage of water were the main reasons for ineffective research (GI, AI). Two respondents working for Pistachio Research Centres stated that it is unrealistic for 6 research centres with 32 researches to solve all the problems of an industry spread across 23 states and covering 400,000 hectares. Academics commented that there are centres at Universities that are supposed to communicate the industry needs to researchers. In their eyes this centres are not fulfilling their roles. Therefore, research output does not meet the demands of the Iranian pistachio industry (AI). Farm owners in the traditional farming system were more satisfied with the knowledge they received from professionals compared to those farmers who wanted to modernize their agriculture system. Small farm owners (10 hectares or less) were mainly concerned about water shortage and survival. According to some respondents production efficiency has decreased because of a reduction of water quantity and quality (OI, AI).

It was pointed by three farmers that it is difficult to have access to the right technical information. For example, it was common to receive opposite advice from professionals working in the pistachio industry (OI). The situation appears to be different for those firms involved in the processing of pistachios. For the last 15 years the private sector has been very proactive in improving plant processing equipment. Respondents emphasized that private research was the corner stone of this improvement. According to them, the current plants are able to process high quality pistachios (EI, PI).

### **3.1.2 Human Resources**

Local human resources were identified by several interviewees, both owners and technicians, as one of the factors limiting further development of the industry. According to them, it is very difficult to find, in the domestic market, employees with the skills/knowledge either to work in pistachio farm production jobs or managerial positions. For instance, it is very difficult to find professionals with the skills to build a modern irrigation system. The owners of big farms, with about 100 hectares, indicated that graduates from Iranian agriculture universities do not have the required skills, practical experience, or commitment to work in the pistachio industry. They also claimed that graduates tend to look for jobs in other sectors rather than pistachio. Those who work in pistachio farms they do so for a limited time and then migrate to cities. Small farmers find very difficult to recruit enough workers for the harvest season. Therefore, they tend to hire employees from Afghanistan or the south of Iran who lack work experience in the pistachio sector.

The majority of the academic professors interviewed did not support entirely the view of owners and technicians. They claimed that over the last 20 years there has been an increase of agriculture engineer's graduates in different agriculture subjects. They recognised that insufficient connection between universities and farms has undermined the quality of graduates. However, they believe that water scarcity is the main constraining factor that has limited a further development of the pistachio industry. The analysis of the qualitative data from this research indicates that there are no training opportunities for those employees working in the pistachio industry. None of the respondents have thought about programmes/workshops to improve the skills of their workforce. The Ministry of Agriculture offers training courses for farmers and technicians. However, most respondents were not aware of these courses or believed they would be irrelevant. Interviewees from the processing plants mentioned that they do not have problems to find qualified employees to work in this sector. Most machinery to process pistachios has been developed locally by Iranian engineering firms (PI).

Respondents from the export sector also believed that there is sufficient quality and quantity of human resources (EI).

### **3.1.3 Physical Resources**

The data collected revealed that farming machinery is sourced from inside and outside the country. Iran has a tariff on imported agriculture machinery. This tariff would, according to the government, protect and help the development of the national industry. Domestic machinery is of inferior quality than imported one. However, many farmers purchase Iranian farming machinery because of its competitive price. Machinery for spraying and irrigation systems is purchased from importers because of the low quality of domestic machinery. Several participants of this research believed that the dismantling of import tariffs on agriculture machinery would give them the possibility to have access to better and more reliable equipment. Those farmers who could afford to buy imported machinery mentioned that support services were deficient. Sometimes they struggled to find spare parts to repair the equipment (OI, PI). The interviewed professors believed that domestic machinery need to be further improved. Many firms produce equipment that is not suited to Iranian farms. These firms copy machinery from other countries but they have failed to adjust it to Iranian farm conditions. This situation contrast with processing equipment which was developed locally and taking into account the conditions of Iranian pistachios. Owners from processing plants were very satisfied with the performance of these machines and customer service provided by local producers.

### **3.1.4 Location Factors**

It is interesting to note that the location factors were not considered important for any of the business owners or professionals from the firms participating in this research. . They stated that the majority of rural areas where pistachio is produced have access to reasonable goods and infrastructure. There are also many processing plants located within one or two hours from the farms. However, they expressed that those farms closed to populated areas get better opportunities to find more qualified employees (OI, PI). Being close to markets was not considered relevant or important for most respondents of this research. Customers are chosen for their buying price rather than the proximity to the farm. Several respondents indicated that differences between paid prices compensate the cost of transport to reach different buyers. In Iran, lorries are allowed to use subsidized fuel.

Brokers and exporters mentioned that it is very important for their business to be located close to the centres of pistachio production in order to be able to buy directly from the farmers. They want to develop long-term relationships with good quality producers. During the last 15 years many exporters opened branches in the states of Yazd and Kerman (BI, EI).

### **3.1.5 Infrastructure Resources**

Most participants believed that infrastructure resources are an important factor condition for the success of the Iranian pistachio industry. According to them, core resources for pistachio production are: water, electricity, and a good transportation network. The average annual rainfall in Iran is below the global average rainfall. Therefore, pistachio production in many areas in Kerman and Yazd provinces are highly dependent on underground water sources. Mismanagement of underground water sources, over the past 30 years, has caused a decrease of water supply and a detriment of water quality (AbdolahiEzatabadi, 2008; Hosseinifard 2006). Interviewed farmers were very concern by this situation and some concluded that they that they were not sure about how to react to this challenge. Others had opted for a harvesting strategy, trying to maximise their profits in the short term in order to cover the original investment.

Most farmers alleged that the government is responsible for this drastic situation. However, respondents from the government strongly disagree with this view. Respondents from government sources highlighted the fact that pistachio farmers did not obey licence's terms and conditions to produce pistachio. Respondents mentioned that farmers were granted permission from the government to plant a certain amount of hectares. The number of hectares is determined by the availability of water resources. Farmers have not respected either the amount of hectares that were allowed to plant or the amount of water that were allowed to take out (GI). The academics interviewees stated that in Iran valuable water resources are used to produce pistachio. These are often fossil water reserves that cannot be replaced. The mismanagement of water resources, from the government and farmers, has made the problem of water scarcity even more critical. Academics believed that the pressure for short-term results has lead to wrong decisions that will compromise the sustainability of many water resources in Iran (AI). Qualitative data from interviews suggests that the availability and price of energy resources have encouraged the development of the pistachio industry.

Since 15 years ago the government has expanded the access to electricity in villages and rural areas where pistachio is produced. This helped farmers to change their energy source from gasoline to electricity. The electric pumps used to exploit the underground water resources have lower maintenance and running costs than diesel pumps (GI). In the agriculture sector electricity sources and petrol sources have been subsidised by the government. Interviewees from the academic sector expressed their concerns about the impact that the cut of subsidies may have for the future of the pistachio industry (AI). The road networks and port infrastructure are other areas where the government intervention has had a positive effect on the development of the pistachio industry. Most of the interviewees stated that the government has developed an integrated transportation network that allows pistachios to be transferred from its centres of production. Most interviewees firmly believe that the port infrastructure offers the adequate quality to export pistachios to its international markets (PI, EI, BI).

### **3.1.6 Demand Conditions**

The qualitative data from the interviews indicates that in 2010, 20% of the total Iranian pistachio production was consumed in the domestic market. Even though the largest proportion of pistachio is consumed in international markets, the domestic market gives producers a safe environment to test consumers' acceptance of new pistachio varieties. Iranian consumers' preferences for pistachios are very similar to the EU consumers' preferences. The only difference is that domestic consumers' purchase both in-shell and fresh pistachio whilst international consumers' only purchase in-shell pistachio (BI, GI, EI). Exporters indicated that from a production of 200,000 tonnes of pistachio, 50,000 tonnes are exported to China, 30,000 tonnes to the EU, 20,000 tonnes to Russia, 40,000 tonnes are consumed internally, and the rest is exported to other international markets (70 countries) (EI). The pistachio nut is different from other dried nuts because it is an open-shell nut, which enables the processor to roast and salt the kernel without removing the shell. The majority of Iranian pistachios exported to international markets are raw in-shell pistachios. Exporters pointed out that importers preferred to process and package pistachio in their own countries as part of their marketing strategy (EI, BI). A high import tariff on processed pistachios was another reason for Iranian pistachios to be exported raw.

Most respondents stated that before 1997, more than two-thirds of Iranian pistachios were exported to the EU. In that year, a sanitary barrier was imposed to those pistachio producers unable to comply with a 4 ppb (part per billion) maximum level of Aflatoxin. The reaction of Iranian pistachio exporters was to look for alternative markets with less demanding sanitary barriers. The gap left in the EU market was covered by American pistachio producers and other nuts (EI, BI). A new agreement signed between the EU and Iran, in February 2010, lifting the acceptable level of Aflatoxin to 15 ppb may boost the exports of Iranian pistachios to the EU (GI). Two interviewees stated that Iranian pistachios taste better than American ones. Therefore, they do not think that there is a need to invest in marketing (PI).

### **3.1.7 Firm Rivalry**

Producers believe that there is no strong competition among domestic producers. They claimed that there has always been a market for their products. They do not feel the threat of new potential entrants due to the difficulties of starting a new business where there is a scarcity of water sources (OI). However, they are very concerned about competition from American producers. They recognize the price advantage of American pistachios in the international market over the past five years, but believe that the unique taste and colour of Iranian pistachios gives them a sustainable comparative advantage. The distinctive colour and taste are a result of the unique characteristics found in Iranian producing areas which are different from those in California, the main region producing pistachio in the United States. It is interesting to point out that other stakeholders hold a different view. Exporters and brokers stated that competition in their sector is high. Exporters must satisfy the needs of demanding customers from different markets. Some consumers - such as importers from China - demand cheap pistachios while other markets demand good quality. For exporters and brokers the only way to survive in this competitive market is developing long-term relationships with farmers (EI, BI). Exporters also stated that it is very difficult to compete with American companies in those markets that demand high quality pistachios. According to them Americans have better quality management systems that allow producing pistachios with lower levels of Aflatoxin than Iranian producers (EI). Even though most respondents indicated that the characteristics of pistachio make it a unique product and therefore, they do not recognize substitute products, the demand for pistachio in some markets is strongly correlated to the price. For instance, when pistachio price has reached 15 US\$ per kilogram (very high) it was replaced by almonds in Arabic countries.

### **3.1.8 Firm Strategy**

The qualitative data from this research indicates that the decision makers within a farm could have different levels of education. There was general agreement on the notion that owners of small farms usually have a relatively low level of education, whilst key decision makers working for big farms have higher levels of higher education. It was generally accepted that the level of education could have influenced the strategy decisions taken by pistachio stakeholders. The results of this research revealed that pistachio firms have followed two different strategies. The firms exporting to China, Russia, and similar markets claimed to have pursued a cost leadership strategy. This group is mainly integrated by less educated farmers who own the small-scale farms and represent 60% of total pistachio production. The other group, integrated by big farm owners, exporting to the EU and more demanding markets that are willing to pay a premium price, claimed to have pursued a differentiation strategy, emphasizing quality and service. It should be highlighted that although interviewees from the latter group stated that quality improvement is where all efforts are directed, at the moment, price continues to be the main concern of the business.

### **3.1.9 Related and Supporting Industries**

Respondents indicated that the pistachio industry has many suppliers, which provide it with different agriculture inputs such as borehole pumps, pesticides, agriculture machinery, fertilizers, water pipes, irrigation systems, and pistachio processing machinery (AI, GI, BI). Several interviewees stated that suppliers are selected on the basis of price and quality. Owing to the importance of the quality of pesticides and borehole pumps, all firms have tried to develop long-term working relationships with pesticide suppliers and service providers for borehole pumps. However, the same principle has not been applied to the rest of the agriculture inputs where firms select suppliers on the basis of price (OI, PI). All respondents emphasized that the majority of transactions were carried out with local suppliers, which did not serve foreign markets.

### **3.2.0 Government Policy**

Qualitative data from this study indicates that selected farms and processing firms have received grants from the government that might have helped these firms to remain competitive. This situation was totally different in the business sector where respondents mentioned that they had not received any government grants. They also found the process of getting a loan from a government bank very slow and tedious (EI, BI). Government's monetary policy has had a big impact on the pistachio industry. The government has employed a floating exchange rate policy, which has kept the value of currency stable. In a country with 15% of inflation, this has meant a decrease in profit margins (PI, BI, EI).

### **3.3 The California Pistachio Industry**

Iranian-American producers, from California, pointed out that easy access to research outputs in modern pistachio farming techniques have fostered the development of the industry. For instance, the application of modern technology has allowed diminishing the levels of toxins such as Aflatoxin. All farm owners revealed that they received support (via grants and loans) from financial institutions. This financial support has helped farmers to meet their growth plans. They also mentioned that government support has further contributed to the development of the industry. Most respondents stated that a weaker dollar; the increase of buying power in developing countries; and a steady increase of the national and international standards for food safety have increased the international demand for American pistachios. However, American producers give high priority to the domestic market which consumes 60% of the US produce of pistachios. The findings from this research indicate that the strategy followed by the majority of interviewed firms is to differentiate their products by improving the quality but keeping the price as competitive as possible.

## **4. Conclusions**

The analysis of the data collected revealed those factor conditions that have played a relevant role in the competitiveness of the firms targeted by this study. Among them, the low quality and lack of water resources are the main constraining factors. Over-exploitation of water, due to inefficient policies to protect underground water, has led to the reduction and poor quality of Iranian water resources. Insufficient good quality water prevents Iranian pistachio producers from achieving the levels of productivity achieved by its counterparts in America.

The electricity cost has been subsidized by the government. This government measure has clearly affected the cost of production. The recent action by the government to cut down on subsidies will potentially affect the cost of production and hence reduce the competitiveness of Iranian pistachios against their American rivals.

Government subsidies implemented in the eighties changed the structure of the industry from one dominated by big farms to one dominated by small ones. This structure, contrast with the American structure which is dominated by larger firms that can exploit the benefits of economies of scale. It seems easier to implement changes in an industry dominated by few big players with a strong financial situation than in an industry dominated by many small players with a diverse level of education and financial situations. All these factors have allowed the American pistachio industry to quickly respond to the new Aflatoxin standards and hence gaining a big part of the market share in the EU and UK. The implementation of a floating exchange rate policy, by the government, is another measure that has profoundly impacted agriculture industries. The analysis of findings from this research suggest that trying to keep the national currency stable in a country with high rate of inflation has undermined profit margins in the pistachio industry and hence its competitiveness.

The analysis of collected data revealed that the lack of resistance of pistachio's rootstock is limiting the productivity of the industry. Americans were able to carry out research and develop different resistant rootstocks that can be adapted to the characteristics of their production areas. Another area where American producers have a clear competitive advantage is in the development and management of irrigation systems. The access to more modern irrigation systems results in higher harvest and a more efficient and sustainable utilisation of underground water resources. Access to financial resources in Iran tends to be very difficult, interest rates are high, offers short payment terms, and often involves a very time-consuming procedure. Financial institutions in Iran are mostly government based. In contrast, American pistachio stakeholders have easy access to low interest loans. The analysis of the data collected revealed that Iranian pistachio producers had no intention of investing in the development of their workforce. This is a common attitude across other agribusiness sectors in Iran. This mind-set may further compromise the competitiveness of the production sector because collected data suggests that it is very difficult to find employees with the required skills to work in the sector.

The lack of relevant, applicable, government or private research – mainly in pistachio production - seems to be one of the strongest weaknesses of the Iranian pistachio industry when compared with the American pistachio industry. A similar situation can be found in the Iranian trade sector. Export firms do not have a clear marketing plan and usually they do not conduct any type of marketing research. The situation is totally different for the Iranian processing sector which has made considerable private research investments that have helped to improve the quality of the final product. The findings from this research suggest that domestic demand conditions have not supported the Iranian pistachio industry to develop competitive advantages. Iranian consumers value certain product attributes that are not regarded as important for most consumers in affluent international markets. Most Iranian and American consumers have different preferences and value different attributes with regards to pistachio products. Iranian consumers are mainly concerned about the physical characteristics of pistachios and not very much interested in food safety standards. Therefore, domestic consumers are not a valid point of reference for Iranian firms to anticipate the need of consumers in western industrialised countries such as America.

Conversely, the similarity of customer preferences between Americans and Europeans has been an advantage for American companies to predict the European customers' needs. The analysis of the data suggests that the strategies followed by Iranian firms will have a different effect on their competitiveness. On the one hand, owners of big farms reacted well to the new Aflatoxin regulations by adopting changes that would allow meeting the new food safety standards. On the other hand, the majority of small farmers carried on using traditional ways of production. This contrast with American produces who continuously incorporate state of the art technology into their businesses. The Iranian industry will face an enormous challenge when more countries adopt stronger food safety regulations.



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