United States Raisin Export Market Trends in the United Kingdom

Presented to the

Faculty of the Agribusiness Department

California Polytechnic State University

In Partial Fulfillment

Of the Requirements for the Degree

Bachelor of Science

by

Paul McChesney

June 7 2010

Approval Page

TITLE: United States Raisin Export Market Trends in the United Kingdom

AUTHOR: Paul McChesney

DATE SUBMITTED: June 7 2010

Senior Project Advisor

Signature

Abstract

One of the agricultural products that the United States exports to England in large quantities is raisins. Raisin exports from the United States to England increased dramatically by 84% from 2007-2008 (USDA 2009). This study was sought to discover the cause of this large increase of raisin exports from 2007-2008, as well as to assess the current international raisin market.

To determine the cause of the increase in raisin exports to England, the top four raisin exporting countries in the world were analyzed to determine if their export quantities had a factor in the United States raisin exports to England. These four countries were Turkey, Iran, Chile, and the United States. Yearly trend analysis was performed on each country's exports from 1987-2008 to determine the overall trend of their exports for the past 21 years. Projections were made for 2009-2012 based off each countries average growth. Substitute (prunes) and Complementary product exports (pecan) from the United States to England from 1992-2008 were also analyzed to determine if they played a role in the large increase in raisin exports. The same trend analysis equations were performed on these exports and future projections were made for 2009-2012 based on average growth.

The results of this study showed an average increase in raisins exports from Chile, Iran, Turkey, and the United States of 9.75% over the past 21 years. Currently the United States is the second largest raisin producer in the world; however, according to the projections both Chile and Iran will surpass the United States in the next few years. Substitute and complementary product exports to England have also increased over the past 18 years, and it

was concluded they did not have a significant effect on raisin exports. The research concludes that international agricultural trade will continue to increase as long as these products remain affordable to consumers.

TABLE OF CONTENTS

Chapter **Page**

I. INTRODUCTION……1
Problem Statement……2
Hypothesis……2
Objectives of Study……3
Justification……3

II. REVIEW OF LITERATURE……5
Overview of the United States Raisin Industry……5
International Raisin Market Competition……8

III. METHODOLOGY……12
Procedure for Data Collection……12
Procedure for Data Analysis……13
Assumptions and Limitations……16

IV. DEVELOPMENT OF THE STUDY……17
Analysis……17

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS……25
Summary……25
Conclusions……26
Recommendations……26
References Cited……28

LIST OF TABLES

Table **Page**

1 .Comparison of United States raisin exports to England and total to Turkeys total raisin exports, with 2009-2012 projections……18

2. .Comparison of United States raisin exports to England and total to Turkeys total raisin exports, with 2009-2012 projections……20

3. Comparison of United States, Chile, Iran, and Turkey raisin exports, projections 2008-2012.22……23

LIST OF FIGURES

Figure **Page**

1 .United States Raisin, Pecan, and Prune Exports to England……...21

2. Raisin Exports for the United States, Turkey, Iran, and Chile…….……24

CHAPTER 1

INTRODUCTION

Global agricultural trade is a developing industry that continues to grow with modern technology. Because of the many different environments around the globe, certain geographic areas are not able to produce enough agricultural goods to support the population living there. On the other hand, other areas are able to supply much more food than an environment's population could ever consume. Regions such as Western Europe are not able to produce enough food and in turn demand products from regions that can produce them, such as North America (Drukin). Technological advances in the modern world, specifically in transportation, allow countries not only to import food that they need, but also foods that they want. Currently, many countries around the world are able to produce food items that other countries demand, creating a competitive market among producing countries.

The United States is one of the biggest producers for international agricultural trade (Villora 2009). The United States imports and exports a great deal of agricultural products to make foods available year-round for not only their population, but also for people around the globe. One product the United States exports at large quantities is raisins, which are high demand around the globe. According to the United States Department of Agriculture's Foreign Agricultural Service (FAS-USDA 2010), the United States exports a large amount of raisins every

year. One of the major importers of these raisins is England. England does not produce enough raisins to meet its national demand, so they import raisins; however, the United States is not the only supplier of raisins to England, competing with countries such as Iran, China, and Turkey for the British raisin market.

One factor that affects international trade are those inferred by the "gravity model" of trade. The gravity model states that countries will trade with the other countries that are in physical proximity to them. Thus the gravity model gives countries like Iran and Turkey a trade advantage over the United States (California) when trading to England because they are closer. This means that the United States must make up for this disadvantage with higher quality, lower prices or better service.

From 2000 to 2006 the United States raisin imports to the Europe Union and England remained at a stable level. However, beginning in 2007 the amount of raisins imported to England increased greatly. This trend also continued into 2008 as well(USDA FAS 2009). The number of raisins exported to England almost doubled to 45,000 metric tons. The purpose of this paper is to assess the reasons of such an increase.

Problem Statement

Why in 2007-2008 did the quantity of raisins imported to England increase so greatly?

Hypothesis

The more than eighty-four percent increase of raisin imports in 2008 from the United States to England is a result of at least a fifteen percent decrease in imported raisins to England from Turkey from 2002 to 2008. The increase is also the result of an eight percent decrease in the export of prunes and an eight percent increase in the amount of tree nuts exported from the United States to England from 2002 to 2008.

Objectives

1. To review the likely cause of the increase of raisin imports from the United States to England in 2008 is due to a decrease in Turkish exports.

2. To assess if the increase in raisin imports from the United States to England is related to a decrease in substitute products or an increase in complementary products from the United States to England.

3. To assess the current state of the United States raisin market internationally in terms of export production, and major competitors.

Justification

The United States is one of the largest raisin producers and exporters in the world, exporting more than 353, 274 metric tons worldwide and over 45,000 metric tons to England in 2008 (USDA- ERS 2009). The year 2008 saw an increase in raisin exports globally for the United States. Specifically, England increased raisin imports from the United States by 84% in 2008. This 84% increase is a major jump considering the stable import numbers from 2002-2007.

The results of this study will provide raisin producers and exporters an idea as to why an increase of this size would occur. Also, this study will provide raisin exporters a look at how substitute and complementary product prices and consumption can affect the raisin market. This research also hopes to determine if the increase in raisin exports will continue to grow, stay at the current level or drop back down to the previous exports levels; thus giving raisin exporters an idea of the future market for their product.

CHAPTER 2

LITERATURE REVIEW

Overview of the United States Raisin Industry

The United States raisin industry is second largest in terms of production and exports in the world (Top Exports-Raisins-2007). California is the leading producer of raisins in the country, making it a focal point for this research project. Long before raisins are exported, the decision to produce raisins must be made. After that decision, many factors influence what happens to raisins long before they are exported. Everything from government marketing orders to consumer marketing plays a huge role in the success of the California raisin industry, nationally and globally. How the California raisin industry developed over the years is also important in determining how large of a role the United States plays in the international raisin market (Nystresm 1973).

The first thing to understand when observing any part of the raisin industry is that raisins are an end product, as well as a intermediate product, of multiple industries, but raisins may be only the third choice and end use of producers when it comes to growing grapes. Nystrem (1973) finds the first choice of grape growers is to send their product to be crushed for wine, and the second choice is for their grapes to be used a table grapes. What is left over then becomes raisins (Nystrem 1973). This view is extremely helpful in understanding the raisin industry as a whole, and provides the basic understanding of how these three end uses are

closely tied. A decrease in demand for one of these products can create a surplus of raisins, which results in lower raisin prices. The question now becomes: how do grape growers survive when the prices are low?

The year 1983 was a bad year for the raisin industry, production numbers were high and prices were extremely low. The California raisin industry had to step in and do something. According to Haleimer (1984) the industry made an effort to create more demand by implementing marketing and advertising programs for raisins. This advertising included television commercials, newspaper advertisements and in store advertisements, showing raisins as animated living characters having fun. She concluded that these marketing programs were successful in terms of selling more product, but they did not help raise prices. This is not constant with the economic assumption that says when demand increases prices will increase as a result of a tighter market.

The actual effectiveness of advertising for agricultural commodities, with constant price, supply, and demand variation is difficult to measure. Carmin, Green, and Mandour (1992) set out to determine whether commodity advertising actually paid off. Their research calculated the total advertising expense per product as a percentage of the total farm value of that commodity. They then compared these results to sales figures before and after the advertising programs were implemented. The research concluded that if average price for units sold and units sold both had a direct relationship to each other after the advertising is implemented, then they concluded the producers are profiting from the advertising.

The raisin industry also tries creative ways to promote their product. Phillips, *et al*. (2006) attempted to determine if changing the way raisins were sold could create new demand. There focus group study attempted to promote raisins as "still on the vine" to two different population segments through tastings and samplings. The research concluded that consumers ages eighteen to twenty-five would be interested in purchasing these types of raisins and thus hoping to creating a new niche market in the raisin industry. The research was never put into action, as this niche market never succeeded in the public setting. With the issue of "how to sell products" also comes the issue of "where to sell them," and the decreasing use of terminal markets is something that has affected raisin sales on a national level and in turn, also affects raisin sales internationally.

Arroyo (2003) tried to determine why terminal markets were becoming less of a factor in agriculture. His market share analysis research on the role terminal markets play with agricultural goods concluded that producers are finding more direct routes to reach their customers. An example from this analysis included the efforts of farmers to use farmers' markets and locally grown campaigns to sell their produce more directly to customers without many third party costs. Along with marketing campaigns, the raisin industry also has marketing orders, which try to control the supply and price of raisins. Marketing orders for raisins is was a topic that was constantly being researched for the answer to the question; "Do marketing orders actually benefit raisin producers (French and Nuckton 1991)?"

French and Nuckton (1991) performed an empirical analysis to determine the actual effectiveness of the volume control section of the marketing order for raisins. The data used in

this research included raisin production numbers, raisin volumes allowed in domestic markets, and actual prices paid to farmers. The research concludes that the marketing order helped create a stabilizing effect on the prices paid to farmers for raisins. This conclusion is important to this project because the variation in prices paid to farmers could play a large role in the amount of product being put into international markets. This is assuming that if farmers are paid well, there would be no reason to force large amounts of product into international markets. More recently, Keeling and Anderson (2004) attempted to determine what would happen if all of the raisin marketing orders were combined into one order under the Raisin Advisory Committee. The research concluded that combining these orders would make raisin prices paid to farmers much more susceptible to demand variation. This means that farmers would take on much more risk, having an indirect effect on the possibility of having to export large amounts at a low price if domestic demand is lower than expected. This was shaped by the idea to let the markets control the, not policy control the market.

International Raisin Market Competition

Although the United States is a large player in England's raisin market, they do not control the market. Many factors affect international markets, such as other raisin exporting countries and currency values. Exchange rates are something that help determine the value of a product when a seller is comparing product from countries that use different currencies. According to Pick (1990), exchange rates play a larger role in developing countries than developed countries. He concludes that developed countries hedge their exchange rate risks,

meaning they pay extra to enter a contract for a certain exchange rate, even though exchange rate contracts cannot hedge for more than a month into the future according to professor Slezak. This is important to this project because this means that exchange rates will not have a direct effect between England and the United States when it comes to purchasing raisins, but it will have an indirect effect because England can buy raisins from a developing country, thus affecting the United States. Exchange rates do affect global trade, but other raisin exporting countries' production has a much greater affect on the United States raisin industry than exchange rates.

One of the largest raisin exporting countries in the world is Turkey. Drukin, et. al (2005) compared Turkey and California as raisin producing areas and concluded that it is less costly to produce raisins in Turkey, thus giving them a cost advantage over California. That makes it difficult for California to compete with Turkey because Turkey also has a shipping advantage over California according to the gravity model used in this research because Turkey is located much closer to England than California.

The gravity model of trade was first employed by Walter Israd in 1954 (Gravity Model). Although there are exceptions to the model, it is generally successful in predicting the general flows of global trade. The gravity model of trade uses distances between countries, as well as per capita income, colonial relations, and GDP per capita as well to determine global trade flows. The gravity model is often used to help predict what would happen if certain trade actions such as tariffs are placed on countries.

Another rising raisin producer and exporter is Iran. Moghaddasi (2007) attempts to determine the ability of Iran to compete for international raisin markets against other major countries. The methods used in this paper include elasticity tests to determine if Iran raisin exports would be susceptible to competitor's prices. Her research concluded that only the United States raisin prices would have an effect on the demand of Iranian raisins due to the scale of raisins the United States exports. Many Middle Eastern countries like Iran produce raisins, and Afghanistan is no exception.

Lister, Brown, and Karaev (2004) performed a case study analysis on the possible returns Afghanistani growers could reap if they are able to build a solid raisin export market. After conducting over thirty-five interviews with raisin growers, exporters, and traders the research concluded that there were two main problems blocking the possibility of major raisin trade. The first problem is that the lower quality of Afghanistan raisins, not up to international standards, and secondly, the lack of a stable trading system in Afghanistan. Non-developed countries struggle to enter international market, while developing countries are starting to internationally compete, and China is a good example of this.

Every facet of American agriculture is currently trying to determine the actual effect that China's growth will have on their market. The raisin industry is no different. Villoria (2009) uses a gravity model to determine both the supply and demand effect China could have on agricultural products in international markets. He concludes that China's domestic demand will consume the majority of it's agricultural products, thus keeping exporting low. He also

concludes that China has a long way to go to be a major player in agricultural trade because currently, the United States agricultural trade is eighty two percent greater than that of China.

Exchange rates and competitors play major roles in international trade, but the actual affect these factors have on the United States must be researched before a conclusion can be made on what really affects the demand for United States raisins in international markets. However, before these factors come in play, the domestic issues including marketing orders and advertising campaigns determine what will actually be exported.

Chapter 3

METHODOLOGY

Procedures for Data Collection

To compare United States raisin export quantities to other competitors, the research included reports on raisin exports from the FAO STAT service (Top Exports-Raisins-2007). Specifically, the data used will have variables representing quantities exported by country and the correlating year those quantities were exported from 1987-2008. The year 1987 was represented by the variable X1 and the year 2008 was represented by the variable X21 for the equations. The value of exports was measured in metric tons. The FAO STAT numbers for raisin exports from Turkey as well as the United States were used to complete objective one.

To complete objective two as well as number one, data came from the United States Department of Agriculture's Economic Research Service (ERS-USDA). The data used consisted of a sixteen year period; 1992-2008. The data consisted of export quantity reports that included United States raisin export quantities in tons to England for these years, as well as substitute product export quantities, prunes, and complement product export quantities, pecans. Total United States raisin export quantities were also used. The data for all three of these products is specifically located in the Fruit and Tree Nut Yearbook spreadsheet files(USDA 2009). Raisins are an elastic good because they are a luxury to people in England. This means that an increase

in pecans could affect the raisin market or a decrease in prune exports could also affect the raisin market. The raisin export quantity for the U.S. in these reports will also be used in objective one, as these numbers will be compared to Turkey's overall raisin exports.

To accomplish the third objective the study used the same ERS-USDA data source as used in objective one and two. But for objective three, additional data used included FAO-STAT reports on the top three raisin exporting countries in the world excluding the United States. The time period for these reports is 1987-2008. The variables being looked at will be export quantity.

The data from the USDA provided the export quantities for the amount of raisins exported to England from 1992 to 2008 used in table one. The prune and pecan exports to England were collected from 1992 to 2008 in Table 2 was also found in the Fruit and Tree Nut Year Book (2009). The total export quantity data from Chile, Iran, Turkey and the United States found in tables one and three was retrieved from FAO-STAT (2009).

Procedures for Data Analysis

The study analyzed the trade data on raisins from Turkey and the United States. The data from Turkey was used to determine if this major competitor decreased their exports by fifteen percent from 2002 to 2008. The United States export data consisted of both total quantity exported and quantity exported to England. The objectives were completed by performing a trend analysis on the twenty one years being studied in this research. The trend analysis equation was: quantity(1988) – base year quantity(1987)/ base year quantity(1987). In

mathematical form the equation for Turkey was: ΔQc X (100)=Qt-(Qt-1)/(Qt-1), c represented the country being analyzed, where C(T,U,E). The variable (T) represented Turkish exports, (U) represented United States total exports, and (E) represented United States exports to England. This calculation was performed for all consecutive years starting in 1987 and ending with the example equation in 2008. This equation was done for all three data sets as well (T,U,E). The result of this calculation when multiplied by 100 is percentage. This percentage is a decrease or increase in the quantity exported from year to year. The results of all three data sets were placed in a table, making them easy to compare. Steps were then taken to prepare an export prediction model.

First, the results of the Turkey exports from each year T1-T21, were averaged to determine if there was a fifteen percent decrease from 2002 to 2008, measuring the criteria for objective one. Then, the results of each trend calculation for all three variables (T, U, E) were used to create an export prediction model that will take the average increase or decrease from 1987 to 2008, and predict the future increase or decrease of raisin exports from year to year for all three variables. The average was determined by adding all the individual year results and dividing by the number of years used in the study (X1+X2……/ # of years). The average percent increase was multiplied by the quantity exported for the year 2008 (assuming that 2008 is 100%) for each variable. The result of this equation is the predicted 2009 export quantity. This was repeated and predicted raisin export quantities for four years in the future, until 2012. This helped the researcher complete objective number one.

The research analyzed the data for objective number two by determining if prune exports from the United States to England increased or decreased from 1992 to 2008 as raisin

exports increased so greatly. The researcher expected to see a decrease in substitute fruit product exports because prunes are a substitute product to raisins. The researcher also analyzed same period data to determine if the amount of pecan exports had increased along with the raisin exports. This would fit the assumption that tree nuts are consumption compliments to raisins. Both of these assumptions were calculated by using the trend analysis equation shown above to determine the percent increase or decrease from year to year for all three products. These three product trend analysis results were placed in a table similar to that from objective one and analyzed to test the hypothesis. The economic model explained above was applied to substitute and complementary products as well, to predict the future export quantities to England. The variables for this analysis will be N for tree nuts and P for prunes. The raisin export quantity data to be used will be the quantity exported to England, or variable E.

To complete objective number three, the study performed the same trend analysis on the FAO STAT data (2007) of the top four raisin exporting countries in terms of quantity exported to determine if these countries will be providing more or less competition for the United States in years to come. This part of the analysis used the total United States raisin export quantities data. The results of these four trend analysis were then be placed into a table and were organized by country. If the trend analysis solution is increasing as the years are, then the study can assume that a certain country will continue to increase exports, thus providing more competition for the United States. This data also provided support for objective one, because the trends of these major exporters could have impacted the increase in United States raisin exports to England.

Assumptions and Limitations

This study assumed that the only raisin importer that directly effects United States raisin imports to England is Turkey. This assumption referred to the hypothesis and objective one. This means that other raisin exporting countries shall not be included in the data gathering process as it relates to England and objective one. The data being collected for objective three was being used only to determine the future of the international raisin market for the United States and is should not be compared in objective one. The researcher also assumed that all the data provided by the ERS-USDA and FAO-STAT matches and is accurate. Another assumption made by the study is that no catastrophic event affected the United States raisin market domestically or internationally from 1992-2008.

Due to these assumptions this project was limited to only covering a small aspect of the raisin market in England. Many other countries export raisins to England but are not being considered due to the limited focus of this study. One limitation of this study was that the data was only be used for trend analysis's, which only provides results as a percentage. It did not take into account the actual quantity or value being exported by certain countries.

Chapter 4

Development of the Study

Table 1 below was created to organize the large amount of data collected and to evaluate the trends that were established in the methodology as well as in the first objective. Table 1 displays the actual quantity exported on the left half of the table, while the percent change in quantity exported is located on the right side. The percentage change in quantity exported was the trend calculation applied to all of the data collected. Using data from 1992 to 2008 gave the research a large time range to determine if any patterns or cyclical events were occurring in the raisin exports from Turkey or the United States. As shown in the percentage change in quantity exported, Turkey only decreased their exports from year to year five times in this sixteen year period. In 1992 Turkey exported 107,696 tons of raisins and in 2008 they exported 252, 581 tons of raisins. Overall, Turkey increased their exports by almost two and one half fold. They also had an average growth rate from year to year of 4.98%, which was applied to predict future export quantities as shown in table 1. The values from 2009 to 2012 in Table one represented these projections.

The United States total raisin exports did not see much of a change in the total quantity exported as shown in the first column of Table 1. In 1992 the U.S. exported 130,938 tons of raisins, while in 2008 they exported 134,495 tons with an annual growth of 2.78% per year. The amount of raisins exported from the United States to England from 2007 to 2008 jumped 84.84%. This remarkable increase seems to be a recovery from low numbers of exports to England from 2005 to 2007. The amount exported to England in 1992 was 31,477 tons, which is only 6,147 tons less than the amount

exported in 2008. This increase in exports to England does not seem to have an inverse relationship with the amount of raisins exported by Turkey during the studied time period.

The United States has increased its raisin exports to England at almost double the rate it has increased its total amounts exported. Table 1 also projects the future quantity exported for each variable in the table by applying the average growth rates of each variable to amount exported in 2008. According to this formula it can be estimated that United States raisin exports to England could be at 44, 617 tons by 2012.

Table 1. Comparison of United States Raisin Exports to England and Worldwide Total to Turkeys Total Raisin Exports, with 2009-2012 Projections

	QUANTITY EXPORTED IN TONS			% CHANGE IN QUANTITY EXPORTED		
YEAR	Total U.S. Exports (U)	U.S. Exports to to England (E)	Total Turkey Exports (T)	Total U.S. Exports (U)	U.S. Exports to to England (E)	Total Turkey Exports (T)
1992	130,938	31,477	107,696	-2.80%	N/A	-8.97%
1993	121,950	27,574	117,964	-6.86%	-12.40%	9.53%
1994	123,472	28,738	173,250	1.25%	4.22%	46.87%
1995	122,970	31,823	169,702	-0.41%	10.74%	-2.05%
1996	125,937	31,535	171,869	2.41%	-0.90%	1.28%
1997	113,069	23,753	180,858	-10.22%	-24.68%	5.23%
1998	119,155	28,922	193,142	5.38%	21.76%	6.79%
1999	99,148	18,837	188,943	-16.79%	-34.87%	-2.17%
2000	93,625	18,823	201,744	-5.57%	-0.07%	6.78%
2001	107,461	26,569	225,743	14.78%	41.15%	11.90%
2002	128,714	23,286	200,920	19.78%	-12.36%	-11.00%
2003	127,945	26,893	196,008	-0.60%	15.49%	-2.44%
2004	132,749	24,799	211,894	3.76%	-7.79%	8.10%
2005	119,648	18,462	226,598	-9.87%	-25.55%	6.94%
2006	125,529	19,661	244,213	4.92%	6.50%	7.77%
2007	130,857	20,358	240,599	4.24%	3.55%	-1.48%
2008	134,495	37,630	252,581	2.78%	84.84%	4.98%
2009	138,234	39,267	265,159	2.78%	4.35%	4.98%
2010	142,077	40,975	278,364	2.78%	4.35%	4.98%
2011	146,027	42,757	292,227	2.78%	4.35%	4.98%
2012	150,086	44,617	306,780	2.78%	4.35%	4.98%

Sources: "Volume of Exports of Selected Commodities, 1996-2006." *Fruit and Tree Nut Yearbook*. USDA-ERS, 2009; "Top Exports-Raisins-2007." *EXPORTS: Countries by Commodity*. FAOSTAT, 2009; Cakiroglu, Osman. 2009. "Turkey Raisin Annual 2009." FAS-USDA Global Information Network

Table 2 provides a snap shot of certain substitute and complementary products to raisins that the United States also exports to England in large quantities. The phenomenal increase in raisin exports to England from 2007 to 2008 could be due to either a decrease in exporting of substitute products (prunes) to England or an increase in complimentary product exports to England (pecans). The most notable data for prune exports came a couple years before the spike in raisin exports. From 2005 to 2006 prune exports increased by 41% and from 2006 to 2007 they increased 55%. Then in 2008 exports flattened out and only increased by 3%. Overall, United States prune exports to England only decreased from year to year five times over the sixteen years studied in this research. This is opposite to the economic assumption made about substitute products, which states that two products can be viewed as alternatives and as one is increasing at a certain percentage, the other will decrease at the same rate. The visual data for table 2 can be seen below in figure 1. Figure 1 was created to show how large of an increase raisin exports can see in the next couple of years, as well as showing the overall increase of all three products exports.

In terms of pecans, the U.S. increased exports to England from 2007 to 2008 by 109.5% following the trend of the raisins. Out of the three commodities studied in the research, pecans have by far seen the most growth in terms of quantity exported to England. In 1992, the United States only exported 588 tons of pecans to England, while in 2008 they exported over 2,920 tons. That is almost six times as much as they exported sixteen years ago. The overall trend of the Pecan exports is unpredictable growth over the past sixteen years, with an export spike the same year that raisins saw a spike. From 1992 to 2008 pecan exports grew at an average rate of 19.14%, which is much greater than the increase in either raisins or prunes to England over the same time period. Raisins increased at 4.35% and prunes increased at a rate of 3.05%. It is predicted that pecan exports to England could reach 5,883 tons by 2012 according to this model.

Table 2. Comparison of United States Raisin, Prune, and Pecan Exports to England 1992-2008, with Projections 2009-2012

	QUANTITY EXPORTED IN TONS			% CHANGE IN QUANTITY EXPORTED		
YEAR	Raisin Exports	Prune Exports	Pecan Exports	Raisin Exports	Prune Exports	Pecan Exports
1992	31,477	8,481	588	N/A	N/A	N/A
1993	27,574	6,656	610	-12.40%	-21.52%	3.72%
1994	28,738	3,888	905	4.22%	-41.59%	48.44%
1995	31,823	5,576	633	10.74%	43.40%	-30.11%
1996	31,535	6,448	861	-0.90%	15.64%	36.07%
1997	23,753	6,039	1,143	-24.68%	-6.34%	32.85%
1998	28,922	5,707	1,726	21.76%	-5.49%	50.94%
1999	18,837	6,931	880	-34.87%	21.45%	-48.99%
2000	18,823	6,871	1,997	-0.07%	-0.87%	126.84%
2001	26,569	7,676	1,680	41.15%	11.72%	-15.89%
2002	23,286	5,083	1,494	-12.36%	-33.78%	-11.03%
2003	26,893	5,777	1,372	15.49%	13.64%	-8.19%
2004	24,799	6,722	1,769	-7.79%	16.36%	28.92%
2005	18,462	2,399	2,172	-25.55%	-64.31%	22.78%
2006	19,661	3,397	1,620	6.50%	41.56%	-25.43%
2007	20,358	5,294	1,397	3.55%	55.85%	-13.76%
2008	37,630	5,455	2,920	84.84%	3.04%	109.05%
2009	39,267	5,621	3,479	4.35%	3.05%	19.14%
2010	40,975	5,792	4,145	4.35%	3.05%	19.14%
2011	42,757	5,969	4,938	4.35%	3.05%	19.14%
2012	44,617	6,151	5,883	4.35%	3.05%	19.14%

Sources: "Volume of Exports of Selected Commodities, 1996-2006." *Fruit and Tree Nut Yearbook*. USDA-ERS, 2009.

After reviewing the trend analysis in Table 2, the second objective can be both rejected and accepted in certain cases. Pecan exports to England have greatly increased since 1992, appearing to confirm the complimentary product assumption, which states that if two products are considered to be compliments, then as ones consumption increase by a certain percentage, then the others will increase at the same rate. On the other hand, the hypothesis is rejected when it comes to substitute products. Prune exports to England increased at a level similar to that of raisin exports according to Table 2. This

disagrees with the economic assumption that substitute products should have and inverse relationship to one and other.

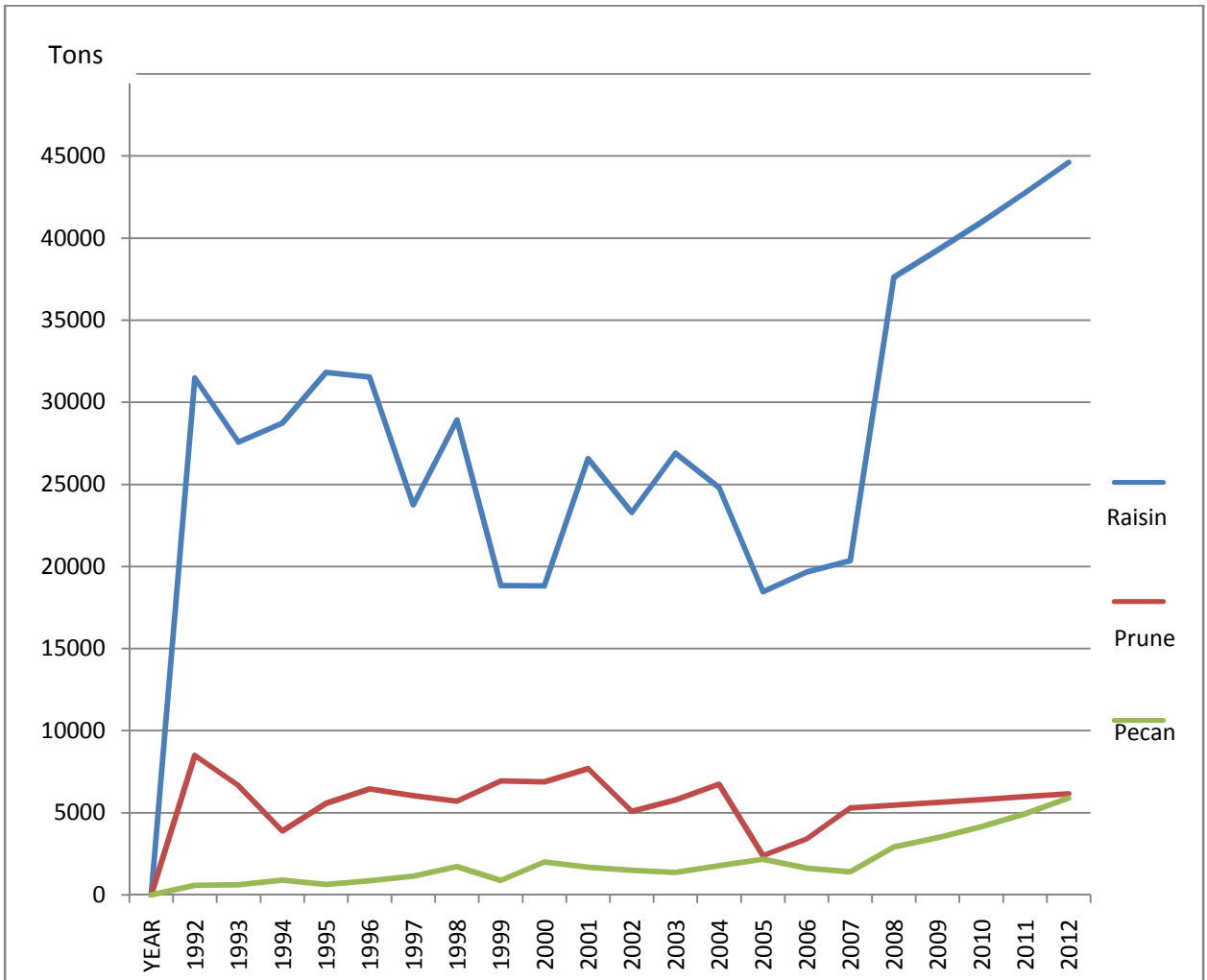

Figure 1. United States Raisin, Pecan, and Prune Exports to to England

Table 3 provides the data necessary to assess the major competing countries that the United States faces when exporting their raisins in the international market. The most notable data collected in table 3 has to do with the development of Chile as a major competitor in the international raisin market. Chile has seen constant growth in the amount of raisins being exported with only seven year to year

export decreases in the twenty-one years that have been studied. In 1987, Chile only exported 8,210 tons of raisins, while in 2007 the exported 122,568 tons of raisins. It is projected from the ERS-USDA (2009) average trend analysis that the amount of raisins Chile will export in 2012 could be 281,954 tons; which would be second to only Turkey. In comparison, Turkey exported 103,295 tons of raisins in 1987 and is averaging an average growth of 4.98%, while Chile has been averaging a growth rate of 18.13% during the twenty-one years studied. The United States has seen the lowest average growth during this time period, increasing their imports at only 2.78% a year.

Currently, the Unites States is the second largest raisin exporting country in the world (see table 3); however, according to the growth rates and predictions (2009-2012) both Iran and Chile will pass the United States in exports and the United States will become the fourth largest raisin exporting country in the world.

Figure 2 was created to display this data shown in table 3 graphically. Figure 2 shows how Chile has become a major player in the international raisin market. Figure 2 also shows the predictions of this research in terms of the United States soon becoming the fourth largest raisin producer.

Table 3. Comparison of United States, Chile, Iran, and Turkey Raisin Exports, Projections 2008-2012

	Quantity Exported IN TONS				% CHANGE IN QUANTITY EXPORTED			
Year	U.S.	Turkey	Iran	Chile	U.S.	Turkey	Iran	Chile
1987	84,775	103,295	42,320	8,210	N/A	N/A	N/A	N/A
1988	99,414	128,543	11,125	13,100	17.27%	24.44%	-73.71%	59.56%
1989	93,424	118,209	13,297	20,802	-6.03%	-8.04%	19.52%	58.79%
1990	122,150	117,102	30,000	26,288	30.75%	-0.94%	125.61%	26.37%
1991	134,715	118,312	62,586	29,403	10.29%	1.03%	108.62%	11.85%
1992	130,938	107,696	53,797	16,007	-2.80%	-8.97%	-14.04%	-45.56%
1993	121,950	117,964	63,572	19,411	-6.86%	9.53%	18.17%	21.27%
1994	123,472	173,250	78,167	31,846	1.25%	46.87%	22.96%	64.06%
1995	122,970	169,702	55,000	28,877	-0.41%	-2.05%	-29.64%	-9.32%
1996	125,937	171,869	50,000	29,683	2.41%	1.28%	-9.09%	2.79%
1997	113,069	180,858	59,703	29,587	-10.22%	5.23%	19.41%	-0.32%
1998	119,155	193,142	89,920	28,305	5.38%	6.79%	50.61%	-4.33%
1999	99,148	188,943	94,328	34,091	-16.79%	-2.17%	4.90%	20.44%
2000	93,625	201,744	105,129	43,875	-5.57%	6.78%	11.45%	28.70%
2001	107,461	225,743	118,013	42,055	14.78%	11.90%	12.26%	-4.15%
2002	128,714	200,920	128,626	41,525	19.78%	-11.00%	8.99%	-1.26%
2003	127,945	196,008	143,634	44,866	-0.60%	-2.44%	11.67%	8.05%
2004	132,749	211,894	137,919	44,723	3.76%	8.10%	-3.98%	-0.32%
2005	119,648	226,598	136,198	57,210	-9.87%	6.94%	-1.25%	27.92%
2006	125,529	244,213	148,035	69,340	4.92%	7.77%	8.69%	21.20%
2007	130,857	240,599	105,790	122,568	4.24%	-1.48%	-28.54%	76.76%
2008	134,495	252,581	119,680	144,790	2.78%	4.98%	13.13%	18.13%
2009	138,234	265,159	135,394	171,040	2.78%	4.98%	13.13%	18.13%
2010	142,077	278,364	153,172	202,049	2.78%	4.98%	13.13%	18.13%
2011	146,027	292,227	173,283	238,681	2.78%	4.98%	13.13%	18.13%
2012	150,086	306,780	196,035	281,954	2.78%	4.98%	13.13%	18.13%

Sources: "Top Exports-Raisins-2007." *EXPORTS: Countries by Commodity*. FAOSTAT, 2009.

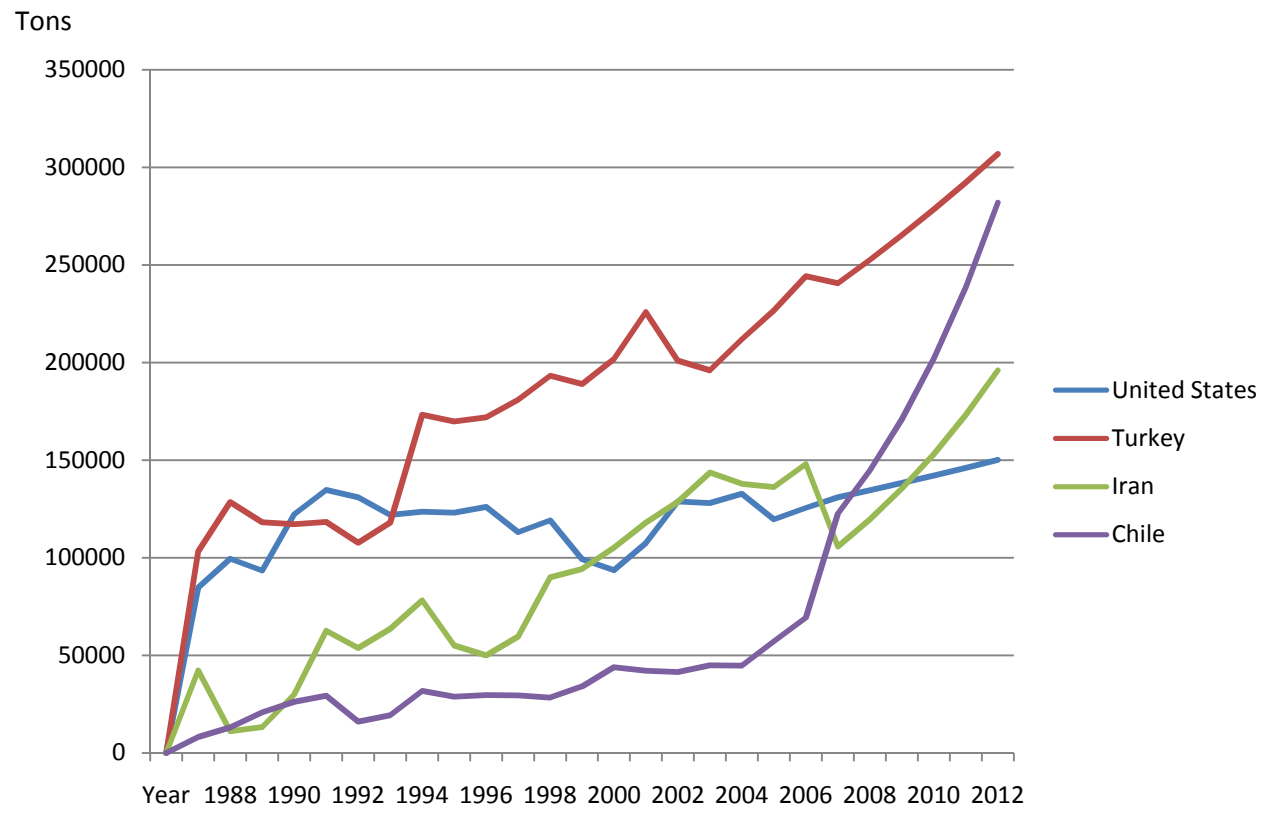

Figure 2. Raisin Export for the United States, Turkey, Iran, and Chile

After analyzing the data and performing the trend analysis equations described in chapter 3, the following results of the study were found. Primarily, the data provided in table one rejected the hypothesis and objective one that stated the amount of raisins Turkey exported would decrease as the amount of raisin exports from the United States to England increased at such a large rate from 2007 to 2008. Turkey has increased its raisin exports over the last twenty-one years and remains the leading raisin exporting country in the world.

Overall the hypothesis is rejected because two of the three criteria were rejected. Also, the main objective, which was Turkey raisin exports decreasing was completely rejected and Turkey only continues to grow as a raisin exporter, while the United States is leveling off and not experiencing the same kind of growth

Chapter 5

Summary

With the increases in modern technology, international agricultural trade plays a major role in the United States economy. A major trading partner of the United States is England, and one of the agricultural products that the United States exports to England in mass quantities is raisins. This study was performed to determine the cause of a major spike in raisin exports from the United States to England from 2007-2008 and to analyze the current international raisin market. The hypothesis put forth tried to determine if competing countries or competing products had an effect on the spike in raisin exports to England. The hypothesis was both rejected and accepted. Objective one analyzed Turkey, the largest raisin exporting country in the world to determine if their exports had decreased in recent years, resulting in an increase in United States exports. Turkey did not decrease their exports by 15% from 2002-2008, but have maintained constant export growth since 1992. The hypothesis was also rejected in the second objective because prunes, which were determined to be a substitute product of raisins, experienced consistent annual growth similar to that of raisins from 1992-2007. The hypothesis was accepted in terms of complimentary products because pecan exports increased annually along with raisins confirming the compliments theory assumption.

In terms of analysis the current international raisin market, the United States is currently the second largest raisin exporter in the world behind Turkey. However, after determining growth rates for the past 21 years, this study determined that soon the United States could be the fourth largest raisin producer in the world, being surpassed by Iran and Chile. Chile saw the greatest export growth over the

past 21 years and competition for the international raisin market has only become more competitive with their growth.

Conclusions

After reviewing the hypothesis and objectives of the research, the researcher concluded that international raisin market has been consistently growing since 1992. Although not every year has seen a constant increase in exports, the trend set by the top four raisin exporting countries in the world suggests a constant expansion of the raisin market. The growth of Chile as a raisin exporter has and will continue to challenge the United States, Iran, and Turkey in international trade. The researcher also concluded that as long as factors of production and transportation are relatively low, raisin exports will only continue to increase at a steady level.

Similarly to raisins, the United States Prune and Pecan export have also been constantly growing since 1992. The availability of agricultural products anywhere in the world has been the main reason behind the growth of international agricultural trade. With technological developments in transportation, consumers around the globe are able to purchase products year round at low prices. The 2007-2008 spike in United States exports was not a result of a decrease in competition or related products, but a result of other factors such as trade agreements or specific economic conditions.

Recommendations

The researcher recommends that this study be applied to help those who want to determine; what are the past, current, and possible future trends of the international raisin industry. Determining who will be the United States biggest competitors in the future can help raisin exporters to decide which markets would be the most promising to enter according to the gravity model(if applied to the countries

presented in Table 3). Raisin exporters as well as raisin producers will also find this research helpful when trying to determine if pursuing growth in their ventures seems like a smart business decision. The answer to that question according to this research is “yes,” due to the constant growth over the last 17 in United States raisin exports.

The research recommends that those who are researching a similar topic use this research to help them determine factors of agricultural trade both domestically and abroad. If studying raisins, the research can be helpful in determining; who are the largest raisin exporters in the world and how does the United States fare in the international raisin market. The researcher suggests that anyone continuing this specific research should consider determining all factors of growing raisins domestically compared to internationally. An analysis of the cost of growing raisins in different regions around the world would be a key indicator of who has the upper-hand in the international raisin market. The researcher also suggests that those who are studying exporting trends should do background research on trade agreements between countries and economic conditions in the countries being studied. This would be helpful in determining sharp increases or decreases in trade.

This research can also be useful in helping provide someone an example of how to apply the substitute and compliment product model to actual products in an international setting.

References Cited

Arroyo, J.R. 2003. “Actual Market Share Analysis of Produce for California Terminal Markets.” Unpublished Senior Project, California Polytechnic State University San Luis Obispo, Senior Project # 03-648. pp 1-20.

Cakiroglu, Osman. 2009. "Turkey Raisin Annual 2009." FAS-USDA Global Information Network.

Carmin, Holly F., Richard D. Green, and Gay J. Mandour. 1992. “Commodity Advertising Pays or Does It.” *California Agriculture*. 46(March-April) 8-12.

Drukin, April, Mary Kate Francesco, John C. Phillips, and Julie Binns. 2005. "An Examination of the Competitive Advantages of the Raisin Industries in California and Turkey." *Journal of Food Distribution Research* 36(March): 225-226.

French, Ben. C. and Carol. F. Nuckton. 1991. “An Empirical Analysis of Economic Performance Under the Marketing Order for Raisin.” *American Journal of Agricultural Economics*. 73(January):581-593.

"Gravity Model of Trade." *Economy Watch*. Stanley St. Labs. Web. 5 June 2010.

Haleimer, Elizabeth. L. 1984. “A Description of Promotional Efforts by the California Raisin Industry During a Critical Surplus Situation.” Unpublished Senior Project, California Polytechnic State University San Luis Obispo. Senior Project # 85-0274. pp 1-17.

Keeling, Jennifer. K. and Matt Anderson. 2004. “Welfare Analysis and Policy Recommendations for the California Raisin Marketing Order.” Paper presented at American Agricultural Economics Association Annual Meeting, Denver, CO, July 1-4.

Lister, Sarah., Tom Brown, and Zainiddin Karaev. 2004. “Understanding Markets in Afghanistan: A Case Study of the Raisin Market.” Afghanistan Research and Evaluation Unit Case Study. (June)

Moghaddasi, Reza. 2007. "Factors Determining Iran’s Share in World Agricultural Markets." Proc. of ‘International Marketing and International Trade of Quality Food Products; Bologna, Italy: 717-21.

Nystrem, L.H. 1973. “A forecasting Model for Thompson Seedless Raisin Prices on the Domestic Market.” Unpublished Senior Project, California Polytechnic State University San Luis Obispo. Senior Project # 73-0085. pp 1-31.

Phillips, Jon C., April Drukin, Mary Kate Francesco, and Julie Binns 2006. “Consumer Preferences

for Cluster Raisins: A Focus Group Investigation." CFMAS Research Report, California Polytechnic State University, Project #06-01.

Pick, D. H. 1990. "Exchange Rate Risk and U.S. Agricultural Trade Flows." *American Journal of Agricultural Economics*. 72(August):694-700.

Villoria, Nelson. 2009. "China's Growth, World Food Prices, and Developing Countries Exports." Selected Paper prepared for presentation at the Agricultural & Applied Economics Association's 2009 AAEA &ACCI Joint Annual Meeting, Milwaukee, July 26-28.

"Volume of Exports of Selected Commodities, 1996-2006." Table G-2. *Fruit and Tree Nut Yearbook*. USDA-ERS, 2009. Albert R. Mann Library, Cornell University.

"Top Exports-Raisins-2007." *EXPORTS: Countries by Commodity*. Food And Agricultural Organization of the United Nations. Rome. 2009.