

COMPETITIVE ANALYSIS OF MAJOR DRY ONION EXPORTING TO VARIOUS COUNTRIES OF THE WORLD

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ABSTRACT

Onion takes third position in world-wide production amongst major vegetable. Onion has properties of not only adding flavor to our dishes but also serves important role in medical field. It is one of the most produces vegetable in India. Accounting on basis of area, around 18 percent production of the world is produce across India. Onions are processed and preserved by suitable means for storage. There are many ways found to store and one of it is dehydration. There are many treatments to dehydrated onion such as solar, vacuum microwave, osmotic convective air drying etc. Onion and Dehydrated onion products are then exported to the great level all over the world. This paper deals with the net value generated as well as quantity of dehydrated onion exported from 5 different countries. To test the significance, ANOVA test is carried out using statistical software along with compounded annual growth rate.

Keywords: *Competitive Analysis, Dry Onion Exporting, Descriptive Statistics, One Way ANOVA.*

Introduction

Onion is one of the essential vegetable grown in India. In terms of land, India stands first globally with over 480 thousand hectares over country sharing 19 per cent of world. Universally, the country ranks second after China in production accounting of approximately 12 per cent. Agriculture exports were given a boost by taking great measure in after liberalization taken in to consideration. Onion was one of the vegetables which got benefited tremendously and has become the one of the highly exported vegetables. Processed food industry is spreading rapidly all over the world. Onion is not only exported in fresh form but also in processed form. Processing is done to dehydrate the onions. Onions' share 6 per cent of production among all the vegetables. Dehydrated onion is leading form of onion export from India. During dehydration process, the water content is removed from onion in order to prevent reproduction of micro-organism and degradation.

India stands second in production of dehydrated onions and it has potential market over the entire world. Consumption of dehydrated onion is high in the European countries, so is the demand for Indian dehydrated onions export. India has witnessed a significant rise in the export of onion and in its related products. There has been a growth in the export of dehydrated onions also known as dried onion.

Review of Literature

- **Dehydration of Onions with Different Drying Methods (Goudra Pramod Gouda, Ramachandra C T and Udaykumar Nidoni, Apr-May-2014):** In this paper they had studied the drying behavior of different onion varieties namely, Arka kalyan, Bijapur white and Arka pragati. Those were dried under open yard sun drying, solar tunnel drying and dehumidified air drying

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methods. Thin layer drying models namely, Page, Midilli-Kucuk and Logarithmic models were applied to the experimental moisture loss data with respect time to predict the drying pattern of onions. The higher coefficient of determination (0.9991) with the lowest root mean square error (0.010) and sum of square error (1.001×10^{-3}), indicated Logarithmic model a better fit to the experimental data compared to other models.

- **Dehydration of onions: some theoretical and practical considerations. (Mazza G. LeMaguer M(1980a)):** The research paper discussed about yellow globe type onion slices were dehydrated with air at different temperatures and flow rates. Drying-rate curves were constructed and used for the calculation of critical moisture content, drying constant, effective diffusivity of moisture through the slices and energy of activation for diffusion. An attempt to relate the process of moisture removal to the process of rehydration was made and a possible diffusion mechanism based on the concept of internal and external resistances is discussed.
- **Performance of onion exports from India: A temporal analysis. (P Kumar (2006)):** In this research paper researcher studied that the changes in composition and direction of onion exports and estimation of export demand for onion. In the decade of 1990s, onion fresh recorded a marginal growth in volume terms whereas onions dehydrated/dried and onions provisionally prepared recorded a very high growth of 23 and 7 percent respectively. The insignificant growth of unit value realization for onions fresh or chilled, onions preserved and onions dehydrated exports is a cause of concern. In Singapore, Sri Lanka, Malaysia, and Mauritius Indian onion fresh or chilled was getting higher unit value price and, therefore, the focus could be to expand the market base in these countries. The supply of onion for exports could be increased through increased production and by way of reduction in post-harvest losses. An adequate policy support is needed to take the available technology to the farmers.

Research Gap

The research reviewed a past study as literature identify research gap itself. After reviewing all the above papers, it is found that all those papers contain information about the dehydrate/dried onion and process of dehydrating onion. There are less paper studied in era of economic study. We studied the net value generated as well as quantity of dehydrated onion exported from 5 different countries.

On the basis of the literature reviewed, present study explores following objectives:

- To explore the major onion exporting countries of the world
- To study the share of export of dehydrated onions from India in the world market
- To analyze the export competitive analysis study the growth of export of dried onions from India

Research Methodology

The study is based on the secondary data collected from electronic data base of food and agriculture organization and APEDA. Secondary data related to dry onions export from 2007 to 2017 by the top five exporters namely India, China (mainland), Afghanistan, Netherlands and Pakistan collected from FAO database. Compounded annual growth rate and Analysis of Variance (ANOVA) test is found appropriate for testing the hypothesis. The Analysis deals with one-way ANOVA, in order to compare the means of groups related to export data and determine whether the data is significantly different statistically.

Hypothesis

Here are two hypothesis for Quantity exported and total value of the export to be carried out under ANOVA.

- **Null Hypothesis (H₀):** Mean of Quantity in tons export of Dehydrate onion product from all 5 selected countries are equal.
- **Alternative Hypothesis (H₁):** Mean of Quantity in tons export of Dehydrate onion product from all 5 selected countries are not equal.
- **Null Hypothesis (H₀):** Mean of Value in USD earned from export of Dehydrate onion product from all 5 selected countries are equal.
- **Alternative Hypothesis (H₁):** Mean of Value in USD earned from export of Dehydrate onion product from all 5 selected countries are not equal.

Result and Findings

Analysis of Quantity (in Tons) exported of Dry Onion carried out by 5 different Countries

The table 1 shows the export of onions from top 5 exporters of the world viz India, China (Mainland), Pakistan, Netherlands and Afghanistan from 2007 to 2017. Along with year-wise Quantity exported, total amount of quantity exported from each country is shown. Further, Compounded Annual Growth Rate (CAGR) is calculated.

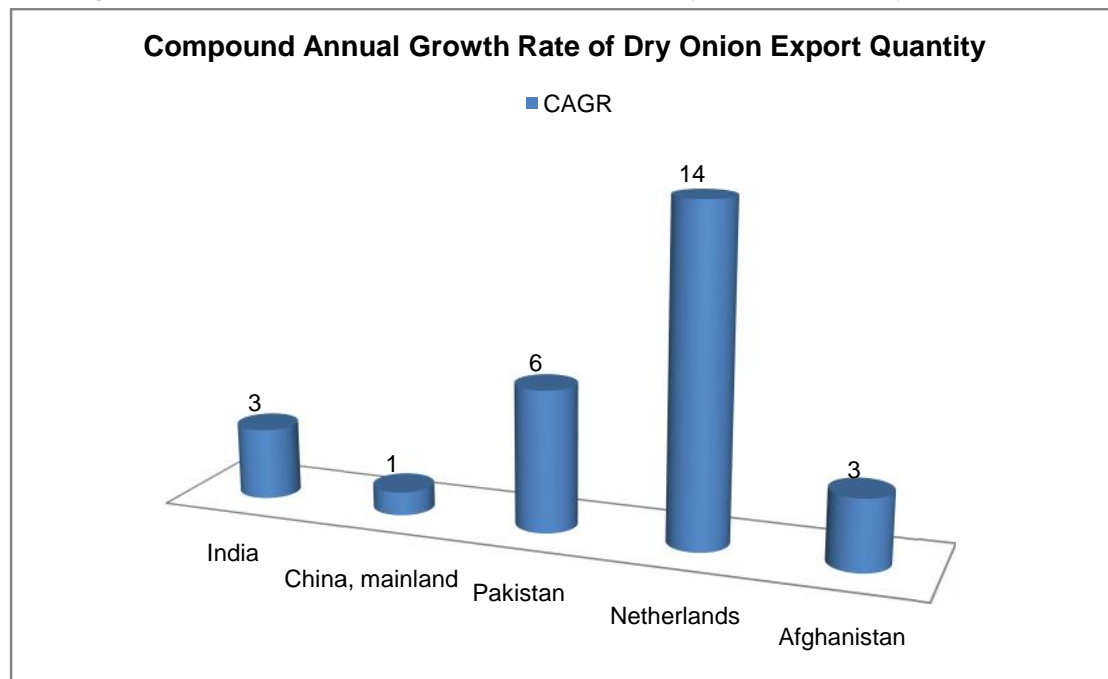
Table 1: Export of Dried Onions (Quantity in Tons)

Year	India	China, Mainland	Pakistan	Netherlands	Afghanistan
2007	2479600	118942	25353	29228	10
2008	2965452	31800	28659	57019	51
2009	2731240	18809	30494	75794	0
2010	2697064	56177	41094	47917	0
2011	2668788	91993	87386	56665	59551
2012	2675768	17102	18632	65473	41371
2013	2879366	105413	70726	54428	72914
2014	3118989	115501	177610	66061	64481
2015	2810401	137414	225249	90597	109180
2016	3405741	85553	67798	98813	47992
2017	3312224	135112	46191	110545	72937
Total	31744633	913816	819192	752540	468487
CAGR(%)	3	1	6	14	3

Source: FAO Data base.

It can be seen from the below figure of Compound Annual Growth Rate (CAGR) that Netherlands has higher CAGR as compared to India, China, Pakistan and Afghanistan. India has 3%, China has 1 percent, Pakistan has 6 percent, Netherlands has 14 percent and Afghanistan has 3% of CAGR which elaborates that, as compared to others, Netherlands had good returns from the quantity exported of dehydrated Onion from year 2007 to 2017.

Figure 1: Compounded Annual Growth Rate of Quantity Exported of Dehydrated Onion



H₀: Mean of Quantity (in tons) exported of Dehydrate Onion products from 5 different selected countries are equal.

To test the above hypothesis, one-way ANOVA test is carried out. Table 2 shows the statistical summary for past 11 years for India, China (Mainland), Pakistan, Netherlands and Afghanistan. Average and variation is calculated for quantity exported. From below table, it can be said that highest quantity exported, on an average, is India followed by China (Mainland), Pakistan, Netherlands and Afghanistan respectively.

Table 2: Statistical Summary for Quantity Exported from 5 Different Countries.

Summary				
Groups	Count	Sum	Average	Variance
India	11	31744633	2885876	83434012502
China, mainland	11	913816	83074.18	2041830441
Pakistan	11	819192	74472	4507408002
Netherlands	11	752540	68412.73	567901915
Afghanistan	11	468487	42589.73	1432271157

Source: Authors calculation based on the data collected from FAO data base.

Table 3: ANOVA test for Quantity Exported by 5 Different Countries

Source of Variation	SS	df	MS	F	P-value	F crit
Between Countries	6.99286×10^{13}	4	1.75×10^{13}	950.2875012	1.75×10^{-46}	2.557179
Within Country	9.19834×10^{11}	50	1.84×10^{10}	-	-	-
Total	7.08484×10^{13}	54	-	-	-	-

Source: Authors calculation based on the data collected from FAO data base.

Above table 3 describes about one-way ANOVA test carried out for quantity exported by 5 different countries. The result of the test carried out on 5% level of significance shows that the mean of the quantity exported by 5 selected countries differ significantly. As quantity exported by 5 selected countries differs significantly, we can easily see that (from table 2) approx 91% of Dehydrated Onion Product is supplied by Indian to the major of countries and Compare to this 5 countries Afghanistan supplied lowest 1.35% Dehydrated Onion Product.

Analysis of Total Value (in USD) of export of Dry Onion carried out by 5 different countries

H₀: Mean of Value (in USD) from export of Dehydrate onion products from all 5 selected countries are equal.

The below table shows the total Value (in USD) exported from 5 different countries namely India, China (Mainland), Pakistan, Netherlands and Afghanistan, on yearly basis starting from 2007 to 2017. Along with year-wise total value of export, Country-wise total value of export for past 11 years and Compounded Annual Growth Rate (CAGR) is calculated.

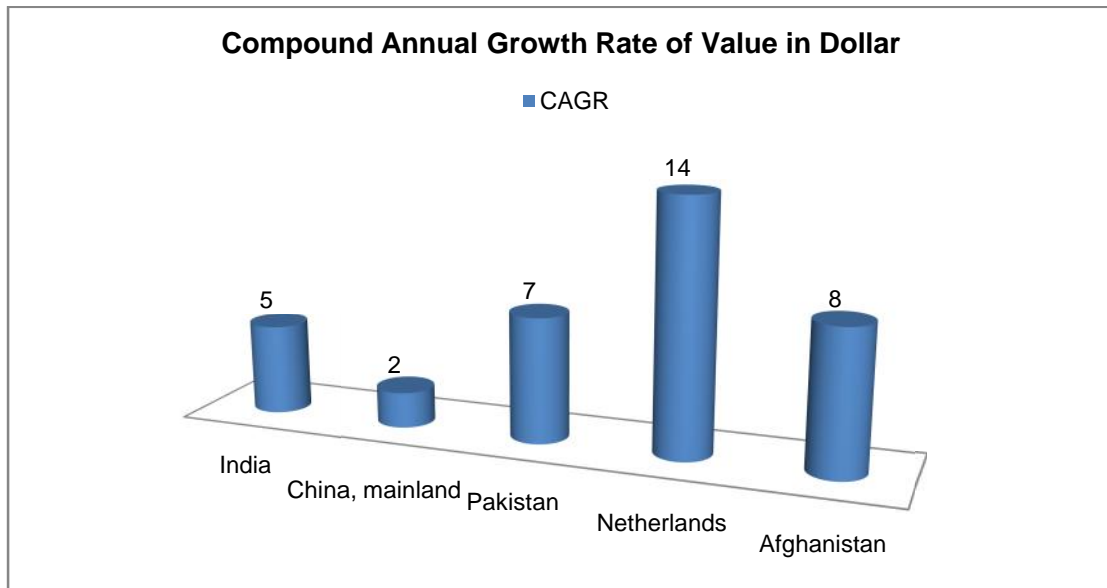
Table 4: Total Value (in USD) of Export Carried out by 5 Different Countries Respectively

Year	India	China, mainland	Pakistan	Netherlands	Afghanistan
2007	990615	34040	6044	11132	9
2008	1653718	10602	6241	19506	8
2009	1660903	6724	10709	23699	
2010	1348690	26735	16715	21387	
2011	1094040	41098	36017	23223	8257
2012	1507875	7789	5414	21592	6685
2013	1403996	46862	26683	22901	14326
2014	1223677	43624	42796	25116	11937
2015	1032195	58196	62640	35096	20062
2016	1808007	30590	13270	40038	8400
2017	1595358	41236	12336	39605	12823
Total	952163	347496	238865	283295	82507
CAGR	5%	2%	7%	14%	8%

Source: FAO Data base.

It can be seen from the below figure of Compound Annual Growth Rate (CAGR) that Netherlands has higher CAGR as compared to India, China, Pakistan and Afghanistan. India has 5 percent, China has 2 percent, Pakistan has 7 percent, Netherlands has 14 percent and Afghanistan has 8 percent of CAGR which elaborates that, as compared to others, Netherlands had good returns from the total value (in USD) of export of dehydrated Onion from year 2007 to 2017.

Figure 2: Compounded Annual Growth Rate of Total Value(in USD) of Export



H₀: Mean of Value In Dollar earn from export of Dehydrate onion product from all 5 selected countries are equal.

To test the above hypothesis, one-way ANOVA test is carried out. Table 5 shows the statistical summary for past 11 years for India, China (Mainland), Pakistan, Netherlands and Afghanistan. Average and variation is calculated for total value of export. From below table, it can be said that maximum total value (in USD) of export, on an average, is of India followed by China (Mainland), Netherlands, Pakistan and Afghanistan respectively.

Table 5: Statistical Summary

Summary				
Groups	Count	Sum	Average	Variance
India	11	15319074	1392643	77834591184
China, mainland	11	347496	31590.55	292525297.9
Pakistan	11	238865	21715	340465563.4
Netherlands	11	283295	25754.09	79156478.09
Afghanistan	9	82507	9167.444	42711062.28

Table 6: ANOVA Test for Total Value of Export

Source of Variation	SS	df	MS	F	P-value	F crit
Between Countries	1.64×10 ¹³	4	4.09×10 ¹²	249.8756126	1.76×10 ⁻³¹	2.565241
Within Country	7.86×10 ¹¹	48	1.64×10 ¹⁰	-	-	-
Total	1.71×10 ¹³	52	-	-	-	-

Above table 6, shows one-way ANOVA test for total value (in USD) of export by 5 different countries. The result of the test at 5% level of significance conclude that the mean of the total value (in USD) of export by 5 selected countries differ significantly. As the total value (in USD) of export by 5 selected countries differ significantly, we can derive that (from table 4) India earned approx 94% by supplying Dehydrated Onion Product to the major of countries and compare to this 5 countries Afghanistan earned lowest 0.51% by supplying Dehydrated Onion Product.

Conclusion

As per the above analysis of Quantity exported and total value of export of Dehydrated Onion by using ANOVA test, it can be concluded that there is significant difference found in quantity (in tons) exported by 5 different countries as well as in total value (in USD) of export. Further to determine which means were different from one another, multiple comparisons can be carried out. As per CAGR (compounded annual growth rate) for Quantity exported and total value of export of Dehydrated Onion shows that Netherlands becomes highest among mentioned 5 countries.

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