

ORIGINAL ARTICLES

Competitive Capability of the Egyptian Exports from Caraway and Fennel Crops

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ABSTRACT

Medicinal and aromatic plants are important and unconventional crops with multi uses, those crops contain many organic components and other materials such as carbohydrates, proteins and plant fats which used in drugs, perfumes, soap, perfection extraction, food and pesticides industries, Egypt is the most ancient country in production of medicinal and aromatic plants. Medicinal and aromatic plants cultivation was known in Egypt at the end of the twentieth century. Egypt has a high comparative advantage in production and exporting of these plants as they are produced early than the other competitive countries. Also, the Egyptian environment is suitable for highly efficiency in cultivation and production. The total area cultivated with those plants in Egypt reached about 65300 feddans as period average (2004-2008) represents about 0.43% of the total crop area of 15.3 million feddan as average of the same period⁽¹⁾. The export value of these plants represents about 5.6% of the total Egyptian agriculture exports value reached about L.E3688.2 million as an average of the same period, this shows the importance of these plants in increasing the value of the Egyptian agriculture exports value and providing foreign currency to achieve the comprehensive development in the country.

Key words:

Introduction

Study Problem:

In spite of the advantages of the medicinal and aromatic plants to be competitive export crops in the world markets, cultivation of these plants and the demand are increasing day by day as a result of the world direction towards safety food and drugs, these plants cultivation on the Local level are not concerned carefully and this led to reduce the exported quantities. No providing the foreign marketing information on these plants also, led to deterioration of the export income whence reduction of the capability of Egypt competition in the world markets, so the study problem is that the Egyptian production and exports of those crops cannot compete the world market, the matter which leads to study both the positions of competition.

The Study Target:

The study aims at measuring the competitive capability of the Egyptian exports from these plants to the foreign markets, also to measure the indicators of these markets for efficiently in: fennel and caraway from where, studying exporting price for Egypt and the competitive countries, quantities of the Egyptian and the competitive countries exports, limiting of the Egyptian competitive position from where, the coefficient of the relative price export efficiency, coefficient of instability of the production and the Egyptian export price and the competitive countries in the foreign markets.

Research Method and Data Sources:

The study depended on using the methods of quantitative and qualitative analysis by using statistic and mathematical method and using some methods of statistical and economic analysis to express some economic variables, stepwise regression, measuring the indicators of the foreign marketing coefficient for the two crops from where the indicators of the competitive price position, coefficient of instability to measure the competitive capability for Egyptian exports. The economic data have been obtained from the Central Authority for General Mobilization and Statistic, Food and Agriculture Organization, UN. Website and same various studies related to the study target.

Results Discussions:

The competitive position is recognized as an increase or decrease in exported quantities from any commodity or the relative change in the exported quantities for each of the competitive countries with Egypt and deviation of these quantities in the opposites of competition degree in the exports.

This deviation is calculated by the difference between the actual export quantities and what it should be. The export of these plants face severe competition in the foreign markets

By studying the export markets and the demand specifications, the competitive position for the Egyptian export from these plants is affected by many factors such as, relative price, probability of fulfillment of the exports requirement and the efficiency of the exporting process⁽²⁾ these factors will be reviewed in the following:

1 – Relative Price:

The relative price is one of the essential limiting and effective on the competitive position in the world market as countries endeavor to reduce their product prices to access more foreign markets, in addition to some policies which aim at achieving the same target such as export subsidies or customs exemption.

Coefficient of relative price = $\frac{\text{export price of competitive countries for any commodity}}{\text{Egypt exporting price for the same commodity}}$

2 – Performance efficiency of exporting process:

The performance efficiency of exporting process is not only limited to prices reduction or production stability but to the essential role of the exporting foundations to achieve the efficiency. Most of various countries concern this role for the different difficulties which affect on the competitive position and the most important element is the time as some exported commodities are exposed to quick damage. The efficiency of exporting process include all process which link to the products, starting from collection process, storage, wrapping, Packing, Transporting to the final consumer. Because of difficulties of providing detailed data on these foundations working in the field of exporting these crops, a proxy variable is used as it is export value to the national income, the increase of this ratio refers to increase the exporting formations numbers whence the increase of competition degree among them. This proxy measure is described with generalization as it used for the commodity of this study which is exported by the state.

The relative measure for performance efficiency of exporting process = $\frac{\text{Total exports value for the state}}{\text{Local total product value for the state}}$

3 – Capability of Fulfillment of Export Requirements:

Recognition of the nature, circumstances, capability of the exporting and importing countries is very important to the exporting process and the capability of exporting requirements fulfillment is also important and necessary to build trust among the importers and exporters to keep the foreign markets and access new ones⁽³⁾. To measure this indicator by the following equation:

The relative measure for the instability coefficient of exports quantity
= $\frac{\text{coefficient of exports quantity instability for the competitive countries from the crop}}{\text{Egypt coefficient of exports quantity instability from the crop}}$

First: Fennel Crop:

- *Export price of fennel crop for the competitive countries to Egypt:*

In this part the study of export price is conducted for Egypt and the competitive countries as the following :

-Export price for Egypt:

From table No: (1), it is clear that the export price average for Egypt reached US \$ 1318 per ton during the period (1995-2012) with minimum limit reached about US\$ 590 per ton in 2001 and with maximum limit reached US\$ 3293 per ton in 2012 with an increase about US\$ 2703, with increase rate about 458.13% than the year 2001. By calculating the equation of general time dissection for Egypt's funnel crop export price , it was clear from the equation No: (1) and the table No: (2) that Egypt export price increased statistically significant and reached about US\$ 136.64 with annual increase reached about 10.38% from the general average during the study period and limitation coefficient reached about 59%.

-Export price for China:

From table No: (1), it is clear that the export price average for China reached US \$ 1020 per ton during the period (1995-2012) with minimum limit reached about US\$ 533 per ton in 1998 and with maximum limit reached US\$ 1570 per ton in 2007 with increase about US\$ 1037, with increase rate about 194.56% than the year 1998. By calculating the equation of general time direction of export price for funnel to China , it is clear from the equation No: (5) and the table No: (2) that the export price to China increased statistically significant and reached about US\$ 39.65 with annual increase reached about 3.89% from the general average during the study period and limitation coefficient reached about 35%.

-Export price for Austria:

Table No: (1), shows that the export price average for Austria reached about US \$ 4825 per ton during the period (1995-2012) with minimum limit reached about US\$ 3142 per ton in 2000 and with maximum limit reached about US\$ 7551 per ton in 2008 with increase about US\$ 4409, with increase rate about 140.32% than the year 2000. By calculating the equation of general time direction of exports price for fennel to Austria , the equation No: (4) and the table No: (2) showed increased in export price for Austria in statistically significant and about US\$ 203.69 within increase rate about 4.22% from the general average during the study period and limitation coefficient reached about 62%.

-Export price for Bulgaria:

Table No: (1), showed that the export price average for Bulgaria reached about US \$ 1838 per ton during the period (1995-2012) with minimum limit reached about US\$ 1005 per ton in 1997 and with maximum limit reached about US\$ 3053 per ton in 2008 with increase about US\$ 2048, with increase rate about 203.78% than the year 1997.. By calculating the equation of general time direction of exports price for fennel to Bulgaria , the equation No: (3) and the table No: (2) showed increased in export price for Bulgaria in statistically significant reached about US\$ 99.45 with annual increase rate about 5.41% from the general average during the study period and limitation coefficient reached about 59%.

Table 1: Export price of fennel in US\$ for the competitive countries during the period (1995-2012).

year	Egypt	Australia	Bulgaria	Austria	China
1995	681	742	1119	4305	597
1996	782	228	1059	3879	1287
1997	1001	564	1005	3471	1295
1998	882	510	1970	3342	533
1999	743	550	1371	3541	548
2000	734	542	1090	3142	788
2001	590	372	1149	3333	713
2002	662	467	1327	3603	588
2003	790	449	1308	4051	649
2004	939	346	1628	5971	1077
2005	847	392	2719	4795	1053
2006	870	460	2183	5136	894
2007	974	989	2990	6998	1570
2008	1144	1874	3053	7551	1553
2009	2751	517	2224	5822	1268
2010	2931	521	2262	5902	1294
2011	3112	524	2297	5974	1318
2012	3293	527	2328	6039	1340
Average	1318	587	1838	4825	1020

Source:- FAO website

- <http://www.un.org/ar/index.shtml>

-Export price for Australia:

Table No: (1), showed that the export price average for Australia reached about US \$ 587 per ton during the period (1995-2012) with minimum limit reached about US\$ 228 per ton in 1996 and with maximum limit reached about US\$ 1874 per ton in 2008 with increase about US\$ 1646, with increase rate about 721.93% than the year 1996.. By calculating the equation of general time direction of exports price for fennel to Australia, the equation No: (2) and the table No: (2) showed increased in export price in not statistically significant reached about US\$ 15.96 with annual increase rate about 2.72% from the general average during the study period and limitation coefficient reached about 21%.

Table 2: Equations of general time direction for fennel export price in competitive countries in US\$ during the period (1995-2012).

Increase rat %	Average	F	R ²	Equations	Country	Serial
10.38	1318	22.83	0.59	$\hat{Y}=20.07+136.64x$ (2.06)(4.78)	Egypt	1
2.72	587	0.96	0.21	$\hat{Y}=435.85+15.96x$ (2.47)(0.98)	Australia	2
5.41	1838	22.82	0.59	$\hat{Y}=89.13+99.45x$ (3.96)(4.78)	Bulgaria	3
4.22	4825	25.92	0.62	$\hat{Y}=2850.19+203.69x$ (2.67)(5.09)	Austria	4
3.89	1020	8.52	0.35	$\hat{Y}=633.61+39.65x$ (4.38)(2.92)	China	5

As it refers to:- \hat{Y} =Calculated value for the phenomenon of the study subject

X= time variable (1,2,3,.....,18)

R² = limitation coefficient ,F = value of model moral

() = the value in the brackets expresses calculated value(T)

Source:- collected and calculated form table No.(1)

-The Trend of Export quantity of fennel crop for competitive countries to Egypt:

In this part, the study of export quantity is conducted in ton for Egypt and the competitive countries as the following:

-Egypt export quantity:

Table No: (3), showed that Egypt exports average for fennel reached about 4155.76 ton during the period (1995-2012) with minimum limit reached about 3026.9 ton in 1997 and with maximum limit reached about 6473.5 ton in 1996 . The Egyptian exports from fennel changed in increase and decrease till reached about 4133 ton in 2012,. By calculating the equation of general time direction of The Egyptian exports from the crop, the equation No: (1) and the table No: (4) showed reduction in the Egyptian export in not statistically significant and that showed the relative stability around the mathematical average during the study period.

-China export quantity:

Table No: (3), showed that Chinese exports average for fennel reached about 3068.47ton during the period (1995-2012) with minimum limit reached about 618.44 ton in 1996 and with maximum limit reached about 4932.22 ton in 2007. With an increase about 4313.78 ton , with increase rate about 677.53% than the year 1996. By calculating the equation of general time direction of The Egyptian exports from the crop, the equation No: (5) and the table No: (4) showed increased in these export was statistically significant reached about 194.75 ton within increase rate reached about 6.35% from the general average during the study period and limitation coefficient reached about 61%.

-Austria export quantity:

Table No: (3), showed that Austria exports average for fennel reached about 224.24ton during the period (1995-2012) with minimum limit reached about 36.54 ton in 2004 and with maximum limit reached about 1109.95 ton in 2005. During the study pried the exports changed in increase and decrease till reached about 374.4 ton in 2012. By calculating the equation of general time direction it was clear that from the equation , No: (4) and the table No: (4) increase in exports quantity is not statistically significant and that showed the relative stability around the mathematical average during the study period.

- Bulgaria export quantity:

Table No: (3), showed that the exports quantity average reached about 131.23 ton during the period (1995-2012) with minimum limit reached about 16.98 ton in 1995 and with maximum limit reached about 257.51 ton in 2003. The exports changed in increase and decrease during the study pried till reached about 203.6 ton in 2012. By calculating the equation of general time direction of The Egyptian exports from the crop, the equation No: (3) and the table No: (4) showed increased in these export quantity is statistically significant reached about 8.51 ton within increase rate reached about 6.21% from the general average during the study period and limitation coefficient reached about 43%.

- Australia export quantity:

Table No: (3), showed that Australia exports quantity average for fennel reached about 92.2ton during the period (1995-2012) with minimum limit reached about 2.3 ton in 1996 and with maximum limit reached about 196.57 ton in 2006. With increase about 194.27 ton. By calculating the equation of general time direction for fennel exports equation the equation , No: (2) and the table No: (4)showed increase in exports quantity is not statistically significant reached about 6.79 ton within increase rate reached about 7.36% from the general average during the study period and limitation coefficient reached about 38%..

Table 3: Development of the exported quantity form fennel in ton for the competitive countries during the period (1995-2012).

year	Egypt	Australia	Bulgaria	Austria	China
1995	5405.90	4.00	16.98	54.49	3159.58
1996	6473.50	2.30	22.96	84.52	618.44
1997	3026.90	39.50	51.00	252.47	763.11
1998	3631.00	10.58	97.09	173.34	1962.64
1999	3421.10	160.55	108.39	134.73	2399.18
2000	3402.20	58.55	160.32	108.85	3259.82
2001	3254.80	108.79	91.05	63.59	2948.05
2002	3227.10	87.16	133.72	52.68	1877.85
2003	3419.50	100.86	257.51	46.14	1962.73
2004	4366.50	108.87	105.76	36.54	2741.67
2005	4096.80	131.05	157.42	1109.95	2716.46
2006	4196.7	196.57	226.92	105.32	4763.14
2007	6320.85	65.93	94.52	178.65	4932.22
2008	4013.89	26.32	75.34	243.49	3400.63
2009	4141	129.5	178	321.4	4140
2010	4138	136.3	186.5	339	4334
2011	4135	143.1	195.1	356.7	4529
2012	4133	149.9	203.6	374.4	4724
Average	4155.76	92.21	131.23	224.24	3068.47

Source:- FAO website

- <http://www.un.org/ar/index.shtml>

Table 4: Equations of the general time direction for export quantity Development for fennel in ton for the competitive countries in during the period (1995-2012).

Increase rat %	Average	F	R2	Equations	Country	serial
-	4155.76	0.003	0.002	$\hat{Y}=4181.56-2.72x$ (8.36)(-0.06)	Egypt	1
7.36	92.21	9.90	0.38	$\hat{Y}=27.69+6.79x$ (189)(3.15)	Australia	2
6.21	131.23	12.28	0.43	$\hat{Y}=50.38+8.51x$ (1.45)(3.50)	Bulgaria	3
-	224.24	2.60	0.14	$\hat{Y}=56.48+17.66x$ (0.48)(1.63)	Austria	4
6.35	3068.47	25.30	0.61	$\hat{Y}=1218.32+194.75x$ (2.19)(5.03)	China	5

As it refers to:- \hat{Y} =Calculated value for the phenomenon of the study subject

X= time variable (1,2,3,.....,18)

R² = limitation coefficient ,F = value of model moral

() = the value in the brackets expresses calculated value (T)

Source:- collected and calculated form table No.(3)

-Factors affecting of the Egypt competitive position for fennel crop:

The data in the table No.(5)refer to the Trends of factors affecting of the Egyptian competitive position for fennel crop during the period (1995-2012).Those factors are described with instability and fluctuation between high and low as the following:

-Relative price X_1 :

Table No. (5) showed that the geometric average of the relative price of fennel reached about 165.95 during the period (1995-2012) and it ranged between minimum limit about 54.82 in 1996 and maximum limit about 613.34 in 2006 ,with increase about 558.52 represents about tenfold from the year 1996.

-Coefficient of instability for local production of fennel X₂.

Table No. (5) showed that the geometric average for coefficient of instability in the local production reached about 18.49 during the period (1995-2012) and it ranged between minimum limit about 0.81 in 2006 and maximum limit about 52.52 in 2007. Instability coefficient is described with fluctuation between increase and decrease during the study period.

-Coefficient of instability for the Egyptian export price of fennel X₃.

Table No. (5) showed that the geometric average for coefficient of instability of the Egyptian export price of the crop was about 11.82 during the period (1995-2012) and it ranged between minimum limit about 5.10 in 2007 and maximum limit about 32.93 in 1997. with decreases about 23.24 and with decreases about 455.69% from the year 2007 and this showed fluctuation of export efficiency for the crop during the study period.

-Efficiency of exporting process X₄.

Table No. (5) Showed that the geometric average for the Efficiency of fennel export reached about 0.007 during the period (1995-2012) and it ranged between minimum limit reached about 0.002 in 2001 and maximum limit reached about 0.010 in 2011&2012, and this showed that there is fluctuation in exporting Efficiency for fennel during the study period.

- The competitive capability of the Egyptian fennel crop:

By calculating the relation between Egypt exports quantity from the crop in ton (Y) and the most important limitation of the competitive capability and by using multi logarithmic model, the following model could be obtained:

$$\ln \hat{Y} = 5.06 + \ln 0.26x_1 + 0.013 \ln x_2 + 0.007 \ln x_3 + 0.081 \ln x_4$$

(2.11) (1.94) (0.24) (0.07) (4.97)

$$R^2 = 0.93 \quad R^{-2} = 0.90 \quad F = 29.62$$

Whereas \hat{Y} refers to export quantity of Egypt from fennel / ton.

X₁ = Relative price = (Egyptian export price / world export price) x 100.

X₂ = Coefficient of instability for local production from the crop.

X₃ = Coefficient of instability for Egyptian export price .

X₄ = Performance efficiency of export process = (value of crop export / national income) x 100.

Results of calculating this model refer to its statistically significant at level 0.01 and limitation coefficient refers to about 93% of the occurred changes in Egypt export quantity from fennel is due to changes in the limiting included in the model. The results refers to direct relation between all the limitings include in the models X₁, X₂, X₃ and Egypt export quantity from the crop (\hat{Y}). To recognize the limitings of the Egyptian competitive position for the crop and the most effective on the crop exports quantity, logarithmic stepwise model was calculated as the followed:

$$\ln \hat{Y} = 5.03 + 0.26 \ln x_1 + 0.79 \ln x_4$$

(2.22) (6.57) (3.14)

$$R^2 = 0.94 \quad R^{-2} = 0.93 \quad F = 71.89$$

Results of calculating this model refer to its significant instability statically at level 0.01 . and limitation coefficient refers to about 93% of the occurred changes in Egypt export quantity from the crop is due to changes in the changements included in the model and the most effective factor on Egypt exports quantity and they are the relative price (X₁) and this does not agree with the economic logic, as the signal is positive, this means there is no logic relation between the price of crop exports quantity also, the most effective factor on Egypt exports quantity from the crop was the performance efficiency of the export process (X₄) and this agrees with the economic logic as the signal is positive. This means when the efficiency increases the Egyptian exports increase also this agrees with results of the model.

The impact of the competitive position on fennel exports for the competitive countries stepwise regression method was used to recognize the most effective factors on Egypt exports quantity and the competitive countries for this crop to reach at better model agree with the economic logic and to be statistically significant which represents the indicative relation between (\hat{Y}) and Egypt export quantity in thousand ton:

X₁ = represents the independent factor and refers to china export price /Egypt (China relative price)

X₂ = represents the independent factor and refers to Austria export price /Egypt (Austria relative price)

X₃ = represents the independent factor and refers to Bulgaria export price /Egypt (Bulgaria relative price)

X₄= represents the independent factor and refers to Australia export price /Egypt (Australia relative price)

X₅= represents the independent factor and refers to China export efficiency/Egypt counterpart

X₆= represents the independent factor and refers to Austria export efficiency/Egypt counterpart

X₇= represents the independent factor and refers to Bulgaria export efficiency/Egypt counterpart

X₈= represents the independent factor and refers to Australia export efficiency/Egypt counterpart

Stepwise regression could be obtained:

$$\ln \hat{Y} = 0.24 - 0.65 \ln x_1 + 1.09 \ln x_2 + 0.63 \ln x_5 + 0.13 \ln x_6 + 0.19 \ln x_7$$

(2.16) (-2.85) (3.79) (2.59) (2.29) (6.47)

$$R^2 = 0.96 \quad R^{-2} = 0.93 \quad F = 35.94$$

Results of this model refers to instability of the was statically significant at level 0.01 ., and stability of statistic moral all calculated independent factor the modified limitation coefficient showed that about 93% of the occurred changes in Egypt export quantity from the crop is due to the factor included in the model. The results of model calculation showed the most independent factor affecting on Egypt export quantity from fennel are (X₁) represent China relative price, (X₂) represent Austria relative price, while mean the independent factor (X₁) agrees with the economic logic and the statistic significant stabilized for each one of them as the signal of China relative price is negative and the impact of this limitation is positive on the competitive centre for all the competitive countries, the independent factor (X₂) dose n,t agrees with the economic logic as the signal of Austria relative price is positive and the impact of this limitation is negative on the competitive position for the competitive countries.

Results of model calculation showed that the most independent factors affecting on Egypt exports quantity from fennel are (X₅) represent China export efficiency/Egypt counterpart, (X₆) represents Austria export efficiency/Egypt counterpart, (X₇) represent Bulgaria export efficiency/Egypt counterpart. each one of The factors were statistically significant and it agrees with the economic logic as the signal of the relative measurement for the efficiency of export performance process for each of China, Austria and Bulgaria / Egypt counterpart is positive and the impact of these limitations is negative on the competitive centre of Egypt.

Table 5: Trends of the Egyptian competitive position limiting form fennel during the period (1995-2012).

year	Performance efficiency of exporting process (x ₄)	Coefficient of Export price instability (x ₃)	Coefficient of production instability (x ₂)	Relative price (x ₁)	Exports quantity (Y)
1995	0.006	5.14	32.25	104.83	5405.90
1996	0.007	6.28	2.04	54.82	6473.50
1997	0.004	32.93	1.40	77.21	3026.90
1998	0.004	14.48	9.47	97.84	3631.00
1999	0.003	5.67	30.93	94.46	3421.10
2000	0.003	8.86	29.55	82.55	3402.20
2001	0.002	28.26	10.24	69.19	3254.80
2002	0.002	21.17	22.79	88.41	3227.10
2003	0.003	7.88	30.05	101.72	3419.50
2004	0.004	7.34	17.74	189.97	4366.50
2005	0.003	5.13	1.05	143.11	4096.80
2006	0.031	4.38	0.81	613.34	41967.00
2007	0.005	5.10	52.52	111.32	6320.85
2008	0.003	21.08	9.28	105.36	4013.89
2009	0.008	10.2	20.19	242.39	4141
2010	0.009	9.91	20.51	256.29	4138
2011	0.01	9.62	20.82	270.19	4135
2012	0.01	9.33	21.12	284.09	4133
Geometric average	0.007	11.82	18.49	165.95	4155.76

Source:-. Collected and calculated from table (2, 3) in the appendix

Second: Caraway crop:

In this part export price of Egypt and the competitive countries, export quantity and the limitations of the competitive position of Egypt for caraway crop are studied as the following:

-Export price to Egypt:

Table No: (6) showed Egypt export price average which reached US \$ 913 per ton during the period (1995-2012) with minimum limit reached about US\$ 447 per ton in 1999 and with maximum limit about US\$ 2101 per ton in 2008 with increase about US\$ 1627 per ton, with increase rate about 43.25% from the year 1999. By calculating the equation of the general time dissection for Egypt caraway export price , it was clear from the

equation No: (1) and the table No: (7) That the increase in Egypt export price in statistically significant reached about 40.09 ton with increase rat reached about 4.39% from the general average during the study period and limitation coefficient reached about 0.32%.

-Export price to Finland:

Table No: (6) showed Finland export price average which reached US \$ 1249 per ton during the period (1995-2012) with minimum limit reached about US\$ 703 per ton in 1998 and with maximum limit about US\$ 2293 per ton in 1995, and fluctuated between increase and decrease till it about reached about US\$ 1290 per ton in 2012 . By calculating the equation of the general time direction for export price of Finland crop , the equation No: (2) and the table No: (7) showed that the increase in export price to Finland is in not statistically significant and this showed the relative export price of Finland is around the mathematic average during the study period.

-Export price to Canada:

Table No: (6) showed that the average of export price to Canada reached about US \$ 1063 per ton during the period (1995-2012) with minimum limit reached about US\$ 730 per ton in 1999 and with maximum limit about US\$ 1819 per ton in 2008, with an increase about US\$ 1089 per ton, with increase rate about 149.18% from the year 1999. By calculating the equation of the general time direction for export price of caraway to Canada , the equation No: (3) and the table No: (7) showed increase in export price to Canada in not statistically significant and that showed the relative stability for export price to Canada around the mathematic average during the study period.

-Export price to Netherland:

Table No: (6) showed that Netherland the average of export price reached about US \$ 1442 per ton during the period (1995-2012) with minimum limit reached about US\$ 829 per ton in 1997 and with maximum limit about US\$ 2792 per ton in 2008, with increase about US\$ 1936 per ton, with increase rate about 236.79% from the year 1997. By calculating the equation of the general time direction for export price of caraway to Netherland the equation No: (4) and the table No: (7) showed increase in export price to Netherland in statistically significant reached about 48.97 ton with increase rat reached about 3.39% from the general average during the study period and limitation coefficient reached about 29%.

-Export price to Poland:

Table No: (6) showed that the average of export price to Poland reached about US \$ 1657 per ton during the period (1995-2012) with minimum limit reached about US\$ 659 per ton in 1998 and with maximum limit about US\$ 2904 per ton in 2008, with increase about US\$ 2245 per ton, with increase rate about 340.67% from the year 1998. By calculating the equation of the general time direction for export price of caraway to Netherland the equation No: (5) and the table No: (7) increase in export price to Poland in statistically significant reached about 93.69 ton with increase rat reached about 5.65% from the general average during the study period and limitation coefficient reached about 49%.

-Export price Germany:

Table No: (6) showed that the average of export price to Germany reached about US \$ 2397 per ton during the period (1995-2012) with minimum limit reached about US\$ 1234 per ton in 1998 and with maximum limit about US\$ 3650 per ton in 2008, with increase about US\$ 2416 per ton, with increase rate about 195.79% from the year 1998. By calculating the equation of the general time direction for export price of caraway to Germany the equation No: (6) and the table No: (7) showed increase in export price to Germany in statistically significant reached about 98.78 ton with increase rate reached about 4.12% from the general average during the study period and limitation coefficient reached about 59%.

-The tread of exports quantity in ton from caraway crop for competitive countries to Egypt:

In this part, the exports quantity in ton for Egypt and the competitive countries are studied as followed:

- Exports quantity of Egypt:

Table No: (8), showed that the average of the Egyptian export from caraway reached about 1852.02 ton during the period (1995-2012) with minimum limit reached about 903.68 ton in 1999 and with maximum limit

reached about 2975.6 ton in 2004, with increase about 2071.92 ton, with increase rate about 229.28% from the year 1999. By calculating the equation of general time direction of The Egyptian exports from this crop, the equation No: (1) and the table No: (9) showed that the decrease in the Egypt exports from this crop is not statistically significant and that showed the relative stability for the crop around the mathematical average during the study period.

Table 6: The trad of the exported price for caraway in dollar for the competitive countries during the period (1995-2012).

Year	Egypt	Germany	Poland	Netherland	Canada	Finland
1995	1025	2789	1871	1926	1459	2293
1996	887	1996	1297	1371	1226	1420
1997	636	1417	752	829	933	754
1998	612	1234	659	838	771	703
1999	474	1469	844	926	730	881
2000	652	1664	978	952	834	919
2001	676	1897	1071	1151	1056	1084
2002	764	2207	1200	1353	1137	1218
2003	676	2351	1188	1405	1086	1192
2004	673	2505	2772	1311	942	1124
2005	726	2272	2093	1345	892	1596
2006	811	2548	1315	1156	815	1500
2007	953	2792	1633	1466	968	1151
2008	2101	3650	2904	2792	1819	1524
2009	1134	2940	2172	1712	1106	1276
2010	1174	3039	2266	1761	1114	1280
2011	1214	3138	2360	1810	1121	1285
2012	1254	3237	2454	1859	1129	1290
Average	913	2397	1657	1442	1063	1249

Source:- FAO website

- <http://www.un.org/ar/index.shtml>

Table 7: Equations of the general time direction for Development of the export price of caraway in dollar for the competitive countries during the period (1995-2012).

Increase rate %	Average	F	R ²	Equations	Country	serial
4.39	913	7.61	0.32	$\hat{Y}=532.59+40.09x$ (3.39)(2.76)	Egypt	1
-	1249	0.08	0.05	$\hat{Y}=1204+4.78x$ (6.58)(0.28)	Finland	2
-	1063	0.41	0.03	$\hat{Y}=989.63+7.75x$ (7.53)(0.64)	Canada	3
3.39	1442	6.56	0.29	$\hat{Y}=977.08+48.97x$ (4.72)(2.56)	Netherland	4
5.65	1657	15.11	0.49	$\hat{Y}=767.11+93.69x$ (2.94)(3.89)	Poland	5
4.12	2397	22.75	0.59	$\hat{Y}=1458.51+98.78x$ (6.51)(4.77)	Germany	6

As it refers to:- \hat{Y} =Calculated value for the phenomenon of the study subject

X= time variable (1,2,3,.....,18)

R² = limitation coefficient ,F = value of model moral

() = the value in the brackets expresses calculated value (T)

Source:- collected and calculated form table No.(6)

- Exports quantity of Finland:

Table No: (8), showed that the average of the exports quantity from caraway to Finland reached about 2432.78 ton during the period (1995-2012) with minimum limit reached about 165.05 ton in 1996 and with maximum limit reached about 6538.53 ton in 2012 , with increase about 6372.88 ton, with increase rate about 3861.18% from the year 1996.By calculating the equation of general time direction for caraway exports, the equation No: (2) and the table No: (9) showed annual increase in export quantity from caraway to Finland which was statistically significant reached about 419.67 ton with increase rate reached about 17.25% from the general average during the study period and determination coefficient reached about 85%. of changes occur in exports to Finland due to time element.

Exports quantity of Canada:

Table No: (8), showed that the average of Canada export from caraway reached about 2347.24 ton during the period (1995-2012) with minimum limit reached about 1330.96 ton in 1995 and with maximum limit reached about 3794.21 ton in 2000 . , with increase about 2463.25 ton, with increase rate about 185.07% from the year 1995.By calculating the equation of general time direction of Canada exports from this crop, the

equation No: (3) and the table No: (9) showed an increase in the export to Canada from caraway is not statistically significant and that showed the relative stability in these exports around the mathematical average during the study period.

- Exports quantity of Netherland:

Table No: (8), showed that the average of caraway crop exported to Netherland reached about 2036.44 ton during the period (1995-2012) with minimum limit reached about 1119.63 ton in 2005 and with maximum limit reached about 3511.9 ton in 1995 , with decrease about 2391.46 ton, with decrease rate about 213.59% from the year 2005. By calculating the equation of general time direction for caraway exports, the equation No: (4) and the table No: (9) showed the of decrease in caraway exports is statistically significant reached about 120.79 ton with decrease rate reached about 5.93% from the general average during the study period and determination coefficient reached about 77%. From the occurred changes in the exports crop to Netherland due to time element.

Exports quantity of Poland:

Table No: (8), showed that the average of the Poland export from caraway reached about 1011.59 ton during the period (1995-2012) with minimum limit reached about 213.27 ton in 1995 and with maximum limit reached about 1910.01 ton in 1998 , fluctuation between increase and decrease till reached about 874.86 ton in 2012. By calculating the equation of general time direction of Poland exports from this crop, the equation No: (5) and the table No: (9) showed decrease in the crop exports which was not statistically significant and that showed the relative stability in these exports around the mathematical average during the study period.

Table 8: Tread of the exported quantity from caraway crop in ton to the competitive countries during the period (1995-2012).

year	Egypt	Germany	Poland	Netherland	Canada	Finland
1995	2091.40	334.92	213.27	3511.09	1330.96	268.74
1996	3149.00	324.19	1552.21	2757.42	1674.12	165.65
1997	1530.50	387.87	1284.42	2620.11	1922.13	298.85
1998	932.89	415.04	1910.01	2537.29	2038.12	451.42
1999	903.68	489.01	778.21	2224.60	3196.22	354.85
2000	1612.50	421.40	903.15	2735.24	3794.21	474.10
2001	1992.00	488.60	872.85	3037.58	2626.62	597.55
2002	1790.00	271.40	1449.42	2438.95	2039.13	913.89
2003	2046.70	339.80	666.44	1776.01	2082.96	1596.12
2004	2975.60	319.70	1493.95	1735.83	2273.26	862.74
2005	1397.80	459.90	1041.76	1119.63	2291.38	1154.05
2006	1589.20	383.50	900.00	1602.36	1891.13	3081.53
2007	2356.68	470.30	747.38	1665.34	1923.06	5009.02
2008	1573.35	516.20	799.57	2130.72	2898.99	4273.58
2009	1849.47	449.86	923.13	1372.12	2519.91	5605.41
2010	1849.01	456.3	907.04	1251.33	2551.3	5916.45
2011	1848.55	462.74	890.95	1130.54	2582.69	6227.49
2012	1848.09	469.18	874.86	1009.75	2614.08	6538.53
Average	1852.02	414.44	1011.59	2036.44	2347.24	2432.78

Source:- FAO website

- <http://www.un.org/ar/index.shtml>

Table 9: Equations of the general time direction for Development of the exports quantity from caraway crop in ton to the competitive countries during the period (1995-2012).

Increase rate %	Average	F	R ²	Equations	Country	serial
-	1552.02	0.001	0.08	$\hat{Y}=1856.37-0.46x$ (6.39)(-0.02)	Egypt	1
17.25	2432.78	88.04	0.85	$\hat{Y}=-1554.05+419.67x$ (-3.21)(9.38)	Finland	2
-	2347.24	1.46	0.08	$\hat{Y}=2049.03+31.39x$ (7.28)(1.21)	Canada	3
5.93	2036.44	52.09	0.77	$\hat{Y}=3183.94-120.79x$ (17.58)(-7.22)	Netherland	4
-	1011.59	0.80	0.05	$\hat{Y}=1164.45-16.09x$ (5.93)(-0.89)	Poland	5
1.55	414.44	4.87	0.23	$\hat{Y}=353.26+6.44x$ (11.18)(2.21)	Germany	6

As it refers to:- \hat{Y} =Calculated value for the phenomenon of the study subject

X= time variable (1,2,3,.....,18)

R² = limitation coefficient ,F = value of model moral

() = the value in the brackets expresses calculated value (T)

Source:- collected and calculated form table No.(8)

Exports quantity of Germany:

Table No: (8), showed that the average of Germany exports from caraway reached about 404.44 ton during the period (1995-2012) with minimum limit reached about 271.40 ton in 2002 and with maximum limit reached about 516.20 ton in 2008 . By calculating the equation of general time direction of The Germany exports from this crop, the equation No: (6) and the table No: (9) showed that the increase in the crop exports was not statistically significant reached about 6.44 ton with decrease rate reached about 1.55% from the general average during the study period and determination coefficient reached about 23%. From the occurred changes in the exports crop to Germany due to time element.

-Limitings of the Egyptian competitive position for caraway crop:

By studying the tread of the Egyptian competitive position for the crop during the period (1995-2012) Table No: (10) data refers to the fluctuation between high and low during the period as the followed :

-Relative price X_1 :

Table No. (10) showed the geometric average for the relative price for caraway crop reached about 69.92 during the that period (1995-2012) and it ranged between minimum limit which about 49 in 2006 and maximum limit about 145.17 in 2008,with increase about 96.17represents about 196.27% from its value in the year 2006.

-Coefficient of local production instability from caraway crop X_2 :

Table No. (10) showed the geometric average for coefficient of instability in the local production from caraway which reached about 31.51 during the period (1995-2012) and it ranged between minimum limit about 4.77 in 2003 and maximum limit about 107.87 in 1995 .with the decrease about 103.1, with decrease rate reached about 2161.43% from year 2003.

-Coefficient of the Egyptian export price instability from caraway crop X_3 :

Table No. (10) showed the geometric average for coefficient of instability from caraway crop which reached about 29.77 during the period (1995-2012) and it ranged between minimum limit about 2.61 in 1997 and maximum limit about 92.07 in 2008 . With as increase of about 89.46, with as increase rate about 3427.59% for the year 1997 .

-Efficiency of export process X_4 :

Table No. (10) showed that the geometric average for export efficiency for the crop reached about 0.0020 during the period (1995-2012) and it ranged between minimum limit about 0.0005 in 1999 and maximum limit about 0.0038 in 1996, this showed fluctuation of export process for the crop during the study period.

- Competitive capability for the Egyptian caraway crop:

By estimating the relation between Egypt exports quantity from caraway crop in ton (Y) and the most important limitings of the Egyptian competitive position for caraway using multi logarithmic model, the following model has been obtained:

$$\ln \hat{Y} = 5.58 - 0.27 \ln x_1 - 0.09 \ln x_2 - 0.02 \ln x_3 + 0.61 \ln x_4$$

(1.98) (1.82-) (2.13-) (0.39-) (9.07)

$$R^2 = 0.92 \quad R^{-2} = 0.89 \quad F = 26.68$$

Whereas \hat{Y} refers to Egypt export quantity from caraway in ton .

X_1 = Relative price =(Egyptian export price / world export price)x100.

X_2 = Coefficient of instability for local production from the crop.

X_3 = Coefficient of instability for the Egyptian export price .

X_4 = efficiency of export process =(value of crop export / national income)x100.

Calculation results of the model was its statistically significant at level 0.01 and determinants coefficient refers to about 92% of the occurred changes in Egypt export quantity from the crop is due to changes in factors included in the model. Results showed there is opposite relation between all the limitations X_1 , X_2 , X_3 and Egypt exports quantity from caraway (\hat{Y}).and there is direct relation between all the variables (X_4) and Egypt exports from caraway and with the economic logic and showed that Egypt has comparative advantage in

exporting caraway corp. To recognize the determinants of the Egyptian competitive position for the crop and the most effective on Egypt exports quantity, the stepwise model has been calculate as followed:

$$\ln \hat{Y} = 5.52 - 0.12 \ln x_2 + 0.59 \ln x_4 \quad (3.12) \quad (10.23) \quad (2.76)$$

$$R^2 = 0.92 \quad R^{-2} = 0.90 \quad F = 38.78$$

By reviewing results of the model calculation, it was clear the stability statistic significant at level 0.01 . and determination coefficient refers to about 92% from the occurred changes in Egypt export quantity from the crop due to changes in the limitations included in the model and they are the most effective on Egypt exports quantity from the crop: Coefficient of instability for local production (X_2) and this agrees with the economic logic, whereas the signal is negative, this means there is logic relation between stability coefficient for the local production and Egypt export quantity. Also the most effective limiting on these exports, the performance efficiency of export process (X_4) and this agrees with the economic logic where as the signal is positive and that is when the efficiency increases, Egypt exports quantity increase ,this agrees with the model results.

Table 10: Trends of the Egyptian competitive centre limitations form caraway crop during the period (1995-2012).

year	Performance efficiency of exporting process (x_4)	Coefficient of Export price instability (x_3)	Coefficient of production instability (x_2)	Relative price (x_1)	Exports quantity (Y)
1995	0.0034	78.91	107.87	61.38	2091.4
1996	0.0038	44.82	61.54	72.34	3149
1997	0.0012	2.61	21.57	80.76	1530.5
1998	0.0007	11.63	59.22	77.23	932.89
1999	0.0005	35.34	40.37	54.67	903.68
2000	0.0012	15.70	21.59	66.40	1612.5
2001	0.0014	16.85	32.92	60.21	1992
2002	0.0015	10.48	10.19	60.88	1790
2003	0.0017	24.37	4.77	54.00	2046.7
2004	0.0021	27.89	7.78	51.39	2975.6
2005	0.0010	25.46	19.24	53.52	1397.8
2006	0.0011	20.01	44.24	49.00	1589.2
2007	0.0017	9.53	7.12	62.50	2356.68
2008	0.0021	92.07	80.48	145.17	1573.35
2009	0.0031	29.98	16.24	75.72	1849.47
2010	0.0032	30.02	13.46	76.77	1849.01
2011	0.0032	30.06	10.68	77.82	1848.55
2012	0.0033	30.1	7.9	78.87	1848.09
Geometric average	0.0020	29.77	31.51	69.92	1852.02

Source:- collected and calculated from table (2,3)in the appendix

- *Impact of the competitive limitings position on the caraway exports for the competitive countries:*

By using the method of stepwise regression analysis to recognize the most effective factors on Egypt exports quantity and the competitive countries to reach at best model agree with economic logic and to be statistically significant which represents the function relation between Egypt export quantity (\hat{Y}) in thus and ton:

X1= represents the independent factor and refers to Finland export price /Egypt (Finland relative price)

X2= represents the independent factor and refers to Canada export price /Egypt (Canada relative price)

X3= represents the independent factor and refers to Netherland export price /Egypt (Netherland relative price)

X4= represents the independent factor and refers to Poland export price /Egypt (Poland relative price)

X5= represents the independent factor and refers to Germany export price /Egypt ((Germany relative price)

X6= represents the independent factor and refers to Finland export efficiency/Egypt counterpart

X7= represents the independent factor and refers to Canada export efficiency/Egypt counterpart

X8= represents the independent factor and refers to Netherland export efficiency/Egypt counterpart

X9= represents the independent factor and refers to Poland export efficiency/Egypt counterpart

X10= represents the independent factor and refers to Germany export efficiency/Egypt counterpart

The following stepwise regression model could be obtained:

$$\ln \hat{Y} = 1.55 - 1.02 \ln x_2 - 0.25 \ln x_4 + 0.26 \ln x_8 + 0.08 \ln x_9 + 0.38 \ln x_{10} \quad (2.57) \quad (4.56) \quad (2.49) \quad (2.27) \quad (4.77) \quad (2.56)$$

$$R^2 = 0.94 \quad R^{-2} = 0.91 \quad F = 46.36$$

Calculation of the results of this model refers to instability of the statistic significant, the calculated model at level 0.01 and the modified determination coefficient showed about 94% from the occurred changes in Egypt's export quantity from the crop due to the occurred changes in the factors included in the model. Results also refer to the most effective and independent factors on Egypt exports from the crop are(X_2) represents

Canada relative price, (X_4) represents Poland relative price and the significance of each stabilized also the two factors X_2, X_3 , agree with the economic logic, whereas the signal of Canada relative price and the Poland relative price is negative and the impact of the two variables X_2, X_4 are positive on the competitive countries position to Egypt. The results refer also to the most effective and independent factors on Egypt exports quantity from caraway are (X_8) which represents the export efficiency of Netherland Egypt counterpart, (X_9) represents Poland export efficiency Netherland /Egypt counterpart, (X_{10}) represents Germany export efficiency/Egypt counterpart and the statistic moral stabilized for all. The factors agree with the economic logic whereas the signal of the relative measure of the performance efficiency of export process for Netherland, Poland, Germany Egypt counterpart is positive, the impact of these limitings is negative on Egypt competitive position and the opposite is correct.

Summary:

Medicinal and aromatic plants are important untraditional crops with multi uses, these crops contain many organic compounds and other materials such as carbohydrates, proteins and plant fats which used in drugs, perfume, soap, perfection extraction food and pesticides industries, Egypt is the most ancient country in production of medicinal and aromatic plants.

This research aims at measuring the competitive capability of the Egyptian exports from these plants in the foreign markets also to measure the indicators of the foreign marketing efficiency for the two mentioned crops, where from studying export price for Egypt and the competitive countries, the quantity of the competitive exports and the competitive countries, limitings of the Egyptian competitive centre where form the relative price exporting efficiency, instability coefficient of production and the competitive export price and the competitive countries to Egypt in the foreign markets.

The study of the export price for fennel crop to the competitive countries showed that export price average of Egypt, China, Austria, Bulgaria, Australia reached US\$ 1318, 1020, 4825, 1838, 587 per ton, respectively during the period (1995-2012) and the average of exports quantity for Egypt, China, Austria, Bulgaria, Australia for the same crops reached 4155.76, 3068.47, 224.24, 131.23, 92.2 ton respectively and for the same period.

By studying the competitive capability for the Egyptian fennel crop by using stepwise logarithmic model it was clear that the stability of its was statistically significant at level 0.01, Results of calculating this model referred to direct relation among all factors included in the models x_1, x_2, x_3, x_4 and the quantity of Egypt's exports from fennel crop (Y) and the most effective factors on the quantity of Egypt's exports from this crop is the negative price (x_1), this does not agree with the economic logic as the signal is positive and that means there is no logic relation between the relative price and the quantity of the crop exports.

Also, the most effective factors on the quantity of Egypt's exports from this crop is the efficiency of export process (x_4), this agrees with the economic logic as the signal is positive and this means when the efficiency increases, the quantity of the Egyptian exports from the crop increases in coincidence with the model results.

By studying the effect of the competitive position factors on the crop exports to the competitive countries by using the style of the logarithmic stepwise regression, the results showed that the most independent factors affecting on Egypt's exports quantity from the crop are (x_5) represents China's exports efficiency / Egypt counterpart (x_6) represents Austria's export efficiency / Egypt counterpart (x_7) represents Bulgaria's exports efficiency / Egypt counterpart.

From the study of export price of caraway crop for the competitive countries to Egypt, it is clear that the price average for Egypt, Finland, Canada, Netherland, Poland, and Germany reached about US\$ 913, 1249, 1063, 1442, 1657, 2397 per ton respectively during the period (1995-2012). The average of Egypt's exports quantity for Finland, Canada, Netherland, Poland and Germany for this crop reached about 1852.02, 2432.78, 2347.24, 2036.44, 1011.59, 404.44, tons respectively during the same period.

By studying the competitive capability of Egyptian caraway crop using the model of logarithmic stepwise regression, the results showed the stability of its statistically was significant at level 0.1 and there is opposite relation among the factors (x_1), (x_2), (x_3) and Egypt's exports quantity from the crop (Y) and direct relation between the variable (x_4) and Egypt's exports quantity in coincidence with the economic logic. This also clears that Egypt has comparative advantage in caraway exports.

From studying the effect of the competitive position limitings on caraway exports to the competitive countries using the analysis method of the logarithmic multi-stepwise regression to recognize the most effecting factors on Egypt and the competitive countries from this crop to reach at the best model in coincidence with economic logic and stability of the statistic significant. Results of calculating this method refer to the stability of the statistic moral at level 0.01 and the most independent affecting factors on Egypt's exports are (x_2) represents the relative price for Canada (x_4) and the relative price for Poland and the moral of each is stabilized. The two factors (x_2, x_4) are positive on the competitive centre of the competitive countries to Egypt. The results of evaluating the model revealed that the most independent affecting factors on Egypt's exports quantity from the crop are (x_8) represents export efficiency to Netherland / Egypt counterpart (x_9) and

represents export efficiency for Poland / Egypt counterpart (x10) and represents export efficiency to Germany / Egypt counterpart and the statistic significant is stabilized. These factors are in coincidence with the economic logic as the signal of the relative measure for the efficiency of the exports process for Netherland, Poland, Germany/ Egypt counterpart is positive and the effect of these limitings is negative on Egypt competitive centre. Finally, the research proposes the following:

- 1- Increase, the local and foreign marketing efficiency for the medicinal and aromatic plants and establish marketing position nearby production areas.
- 2- Open new markets for the two crops and promotion of the level of foreign marketing efficiency and keeping the current markets through improving production efficiency to match with the global specifications .
- 3- Encourage the private sector to cultivate medicinal and aromatic plants and reduce the costs of production requisites besides to acknowledge these plants importance for local consumption and export.
- 4- Activate the role of the commercial representation to export these plants through providing the information on importing markets such as dates of exporting, competitive countries, export prices required specifications for the importing markets to enable Egypt to develop its exports in quantities suitable to these products.

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Appendix

Table 1: Development of export efficiency coefficient for the most important countries exporting to fennel crop during the period (1995-2012) (million dollar).

years	Australia			Bulgaria			Austria			China			Egypt		
	Export value	National income	Efficiency coefficient	Export value	National income	Efficiency coefficient	Export value	National income	Efficiency coefficient	Export value	National income	Efficiency coefficient	Export value	National income	Efficiency coefficient
1995	0.009	347853	0.003	0.015	12681	0.019	0.001	235446.43	0.235	1995	716233	1.886	0.006	62885	3.682
1996	0.001	378307	0.001	0.026	9512	0.024	0.0014	233986.87	0.328	1996	843648	0.796	0.007	72591	5.060
1997	0.054	412076	0.022	0.051	10015	0.051	0.0043	205644.15	0.876	1997	941649	0.989	0.004	78528	3.030
1998	0.014	379355	0.005	0.154	12447	0.191	0.0028	210491.22	0.579	1998	1002815	1.046	0.004	82795	3.202
1999	0.239	369301	0.088	0.116	12768	0.149	0.0023	208608.35	0.477	1999	1068808	1.315	0.003	92354	2.542
2000	0.081	393649	0.032	0.142	12281	0.175	0.0018	190110.56	0.342	2000	1183815	2.567	0.003	91058	2.497
2001	0.112	359838	0.040	0.077	13626	0.105	0.0011	188551.14	0.212	2001	1305630	2.102	0.002	93164	1.921
2002	0.109	374660	0.041	0.111	15981	0.177	0.0009	205260.30	0.190	2002	1438883	1.103	0.002	92163	2.137
2003	0.102	442331	0.045	0.166	20311	0.337	0.0007	252985.21	0.187	2003	1633121	1.273	0.003	81563	2.701
2004	0.065	581527	0.038	0.069	24953	0.172	0.0008	290517.38	0.218	2004	1928118	2.952	0.004	93652	4.101
2005	0.079	649762	0.051	0.157	27271	0.428	0.0176	301960.95	5.323	2005	2246549	2.861	0.003	106721	3.468
2006	0.13	696153	0.090	0.161	30800	0.495	0.0017	319425.42	0.541	2006	2673038	4.257	0.031	117791	36.506
2007	0.083	785230	0.065	0.074	38029	0.283	0.0034	366990.72	1.250	2007	3407955	7.745	0.005	130480	6.160
2008	0.051	968532	0.049	0.048	48137	0.230	0.0045	411283.00	1.839	2008	4370420	5.281	0.003	160470	4.591
2009	0.083	810170.3	0.067	0.001	39631.95	0.396	0.0005	358026.2	1.871	2009	3512216	5.25	0.008	136486.3	11.39
2010	0.084	850206.6	0.071	0.001	42165.62	0.422	0.0005	371274.8	2.001	2010	3744696	5.61	0.009	141768.1	12.13
2011	0.083	890242.9	0.075	0.001	44699.29	0.448	0.0006	384523.4	2.131	2011	3977175	5.97	0.009	147050	12.87
2012	0.085	930279.2	0.079	0.001	47232.96	0.474	0.0006	397772	2.261	2012	4209655	6.33	0.009	152331.8	13.61

Source:- FAO website

Table 2: Development of export efficiency coefficient for the most important countries exporting to caraway crop during the period (1995-2012) (million dollar).

years	Germany			Poland			Netherlands			Canada			Finland			Egypt		
	Export value	National income	Efficiency coefficient	Export value	National income	Efficiency coefficient	Export value	National income	Efficiency coefficient	Export value	National income	Efficiency coefficient	Export value	National income	Efficiency coefficient	Export value	National income	Efficiency coefficient
1995	0.004	2504108	0.934	0.029	137100	0.399	0.159	425194	6.761	0.034	569714	1.941	0.005	126432	0.616	0.034	62885	2.143
1996	0.003	2425643	0.647	0.129	155586	2.013	0.09	421712	3.781	0.035	592984	2.052	0.002	125100	0.235	0.039	72591	2.795
1997	0.003	2144947	0.550	0.062	155953	0.966	0.055	391687	2.172	0.029	617528	1.794	0.002	121045	0.225	0.012	78528	0.973
1998	0.002	2161854	0.512	0.074	170818	1.258	0.053	398471	2.125	0.026	596261	1.571	0.002	127291	0.317	0.007	82795	0.571
1999	0.003	2120680	0.718	0.039	166932	0.657	0.05	415933	2.060	0.037	638897	2.332	0.002	129053	0.313	0.005	92354	0.428
2000	0.004	1882403	0.701	0.052	169844	0.883	0.066	393385	2.604	0.045	706043	3.164	0.004	121017	0.436	0.012	91058	1.051
2001	0.005	1872170	0.927	0.049	189049	0.935	0.087	403678	3.496	0.04	695180	2.774	0.005	124921	0.648	0.014	93164	1.347
2002	0.003	1991944	0.599	0.089	196323	1.740	0.075	441811	3.301	0.032	716266	2.319	0.008	135887	1.113	0.015	92163	1.367
2003	0.003	2425135	0.799	0.037	213186	0.792	0.046	544433	2.495	0.027	845468	2.262	0.012	162587	1.902	0.017	81563	1.383
2004	0.003	2764179	0.801	0.169	244763	4.142	0.036	626189	2.275	0.022	971963	2.142	0.005	190495	0.969	0.021	93652	2.003
2005	0.004	2816814	1.045	0.073	297303	2.181	0.024	636938	1.506	0.018	1114491	2.044	0.009	196744	1.842	0.010	106721	1.014
2006	0.003	2941124	0.977	0.036	332190	1.183	0.027	681365	1.852	0.012	1265473	1.542	0.022	211680	4.622	0.011	117791	1.288
2007	0.004	3349652	1.313	0.03	411971	1.220	0.031	781129	2.441	0.014	1318302	1.862	0.023	246353	5.765	0.017	130480	2.246
2008	0.005	3686794	1.884	0.045	517406	2.322	0.068	877537	5.949	0.038	1391403	5.273	0.024	273092	6.515	0.021	160470	3.305
2009	0.0040	3202754	1.342	0.057	417286	2.181	0.022	789406	2.532	0.021	1358200	2.991	0.021	245865	5.052	0.012	136486	1.921
2010	0.0041	3295622	1.402	0.056	440939	2.275	0.017	823808	2.461	0.019	1424627	3.075	0.023	256822	5.483	0.011	141768	1.971
2011	0.0042	3388489	1.463	0.055	464593	2.368	0.011	858210	2.391	0.018	1491054	3.159	0.025	267778	5.913	0.010	147050	2.021
2012	0.0043	3481357	1.524	0.054	488246	2.462	0.006	892613	2.321	0.017	1557481	3.243	0.026	278734	6.344	0.010	152332	2.071

Source:- FAO website

Table 3: World export price for fennel and caraway Crops during the period (1995-2012) (Thousand dollar).

year	Caraway	Fennel
1995	1.6695	0.6498
1996	1.2268	1.4259
1997	0.7874	1.2962
1998	0.7929	0.9014
1999	0.8669	0.7867
2000	0.9814	0.889
2001	1.123	0.8529
2002	1.2546	0.7491
2003	1.2512	0.7766
2004	1.3098	0.4944
2005	1.3558	0.5915
2006	1.6546	0.1418
2007	1.5252	0.8754
2008	1.447	1.0856
2009	5.930	0.5724
2010	6.260	0.5394
2011	6.590	0.5064
2012	6.920	0.4734

Source: Central Agency for General Mobilization and statistics, National Centre for information.