مروة غالي واخرون

نموذج قياسى اني للفول البلدي في مصر

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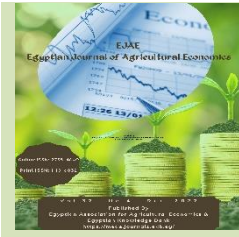قسم الإقتصاد الزراعى، كلية الزراعة، جامعة عين شمس.

بيانات البحث	المستخلص
	استهدف البحث التعرف علي تطور انتاج واستهلاك وواردات الفول البلدي في مصر خلال الفترة (2010-2019) وكذلك عمل نموذج اقتصادي قياسي اني يتكون من اهم المتغيرات المتشابكة والمتبادلة المكونة لسوق الفول البلدي في مصر سواء انتاج او استهلاك او استيراد.
	وتبين من نتاج الدالة إلي أن كمية الانتاج من محصول الفول البلدي تقل سنويا بمعدل معنوي إحصائيا قدر بنحو 9.7 ألف طن سنويا، يمثل حوالي 0.67 % من المتوسط السنوى لإجمالي انتاج محصول الفول البلدي والبالغ نحو 1468.0 ألف طن من محصول الفول البلدي خلال الفترة (2010-2019) وأشارت نتاج الدالة إلي أن كمية النسبة متاح للاستهلاك من محصول الفول البلدي تزيد سنويا بنحو 56.5ألف طن سنويا، يمثل حوالي1.0% من المتوسط السنوى لإجمالي النسبة متاح للاستهلاك محصول الفول البلدي والبالغ نحو 5598.0 ألف طن من محصول الفول البلدي خلال الفترة الدراسة.

وأشارت نتاج الدالة إلي أن كمية الواردات من محصول الفول البلدي تزيد سنويا بنحو 69.5 ألف طن سنويا، يمثل حوالي 1.6 % من المتوسط السنوى لإجمالي واردات محصول الفول البلدي والبالغ نحو 4361.0 ألف طن من محصول الفول البلدي خلال الفترة الدراسة.

ومن نتائج التقدير التنبؤ بالنماذج الفول البلدي أن الانتاج يتدهور من عام إلي أخر ونفس الحال بالنسبة لتنبؤ الاتجاة العام في الوقت الذى تتذاذيد قيم الاستهلاك المتوقع من الفول كامل النضج من عام الي أخر في اتجاة تضاعف الاستهلاك خلال السنوات الاخيرة الامر الذي يؤدي إلى انهيار زراعة الفول بصة عامة والاعتماد كليا على الاستيراد |

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Simultaneous Equations Models for Fava bean Crop in Egypt

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A R T I C L E I N F O

A B S T R A C T

The research aimed to identify the development of production, consumption and imports of municipal beans in Egypt during the period (2010-2019) as well as the work of an econometric model consisting of the most important interlocking and mutual variables that make up the municipal bean market in Egypt, whether production, consumption or import. It was found that the amount of production of the municipal bean crop decreases annually at an estimated rate of about 9.7 thousand tons per year, representing about 0.67% of the annual average of the total production of about 1468.0 thousand tons (2010-2019) and that the amount of the percentage available for consumption of the municipal bean crop increases annually by about 56.5 thousand tons annually, representing about 1.0% of the annual average of the total percentage available for consumption, which is about 5598.0 thousand tons.

The amount of imports of the municipal bean crop increases annually by about 69.5 thousand tons annually, representing about 1.6% of the annual average of total imports of about 4361.0 thousand tons.

One of the results of the estimate is the forecasting of municipal bean models that production is deteriorating from year to year and the same is the case for the prediction of the general trend at a time when the expected consumption values of fully matured beans increase from year to year in the direction of doubling consumption during recent years, which leads to the collapse of bean cultivation in general and dependence entirely on imports

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Introduction: Despite the importance of the fava bean crop for leguminous crops in Egypt, its production has been decreasing in the past years, as it decreased from about 305 thousand tons in 2007 to about 101 thousand tons in 2019. And that there is a significant change in the percentage available for consumption to obtain fava beans, as the average consumption of fava beans crop increased from about 395.0 thousand tons in 2010 to about 964.0 thousand tons in 2019. The food gap in Egypt from the fava bean crop during the period (2010-2019) fluctuated between high and low, and the food gap of the fava bean crop during the period (2010-2019) ranged between a minimum of about 161.0 kg in 2010, and a maximum estimated at 863.0 kg in 2018, while the average was about 413.0 kg during the period. considered. A big surge in imports Fava bean yield, where the average amount of fava bean crop increased from about 179.0 thousand tons in 2010 to about 892.0 thousand tons in 2019. By comparing the results of the forecast using the simultaneous model by predicting using the general direction equations, the credibility of the results of the model is shown, where by estimating the standard deviation of the variables under study, it is found that the value of the deviations of the values of the variables under study using the model is low using the general trend equations Thus, an increase towards the use of standard models in prediction, due to their importance in clarifying the interchangeable and intertwined relationships between variables, which is difficult to clarify models with a single equation, the expected values of the model variables are more realistic and logical than those that are estimated using other methods of estimation.

Study problem

Fava beans are a strategic commodity for the Egyptian citizen, due to their high nutritional value, vegetable protein content and cheap price compared to other protein sources, although Egypt is considered one of the most importing countries for fava beans, as statistics indicate that Egypt imported about 892.0 thousand tons, while production was 101.0 thousand tons the year of 2019.

Objectives of the study

The study aims to identify the development of production, consumption and imports of fava beans in Egypt during the period (2010-2019), as well as the work of an econometric model consisting of the most important interlocking and mutual variables that make up the fava bean market in Egypt, whether production, consumption or import.

The study relied in its economic analysis on descriptive and quantitative statistical analysis methods, in addition to the ecinometric methods represented in the estimation of some models such as simple linear regression, multiple and multiple, as well as the use of the method of phased regression, and the matrix of correlation coefficients, in addition to the use of a standard model to study the municipal bean market in Egypt.

First: The relative importance of legume production in Egypt during the period (2015/2019).

Table (1) shows the production of legume crops during the period (2015/2019). From it, it is clear that fava beans ranked first in terms of production with an average of about 125336.2 tons, representing about75.1% of the total production.

While green beans ranked second in terms of production with an average of about 32585.4 tons, representing about19.5% of the total production.

Chickpeas ranked third in terms of production with an average of about 3649.8 tons, representing about2.2% of the total production.

Then fenugreek, lentils and thermos ranked fourth, fifth and sixth in terms of production with an average of about 3546.0, 1431.8.4, 338.6 tons, respectively, and a percentage of about 2.1, 0.9 and 0.2% respectively.

Table (1): Production of leguminous seed crops in Egypt during the period (2015/2019).

%	medium	2019	2018	2017	2016	2015	Production
75.10207	125336.2	100904	116435	170436	119056	119850	Fava beans
19.52533	32585.4	37913	41933	26928	23402	32751	Green Beans
0.857942	1431.8	352	1585	2381	1591	1250	lentils
2.124781	3546	3035	2881	2790	4503	4521	Circuit
2.186978	3649.8	3509	6520	4140	2943	1137	Homs
0.202891	338.6	255	201	165	347	725	Lupinus
100	166887.8	145968	169555	206840	151842	160234	Total

Source: Collected and calculated from the Central Agency for Public Mobilization and Statistics, Census of Areas and Plant Production, various items.

Second: The development of fava bean production in Egypt during the period (2010-2019)

By reviewing the data of Table (1) in the annex, it was found that the production of fava beans crop in Egypt during the period (2010-2019) ranged between a minimum of about 116.0 thousand tons in 2018, and a maximum of about 234.0 thousand tons in 2010, and it is noted from the data that the production of fava beans in Egypt began to decline during the period in question. Table (2) shows the equation of the general time trend of Egypt's production of fava beans during the period (2019-2010), and indicated that the amount of production of fava beans decreases annually at a statistically significant rate of about 9.7 thousand tons annually, representing about 67% of the annual average of the total production of fava beans crop of about 1468.0 A thousand tons, and it was found through the determination factor that time is responsible for 56% of the changes that were exposed to the production of fava beans during the period (2010-2019).

Table (2): Overall Time Trend Production Development of Fava beans Crop in Egypt during the Period2019-2010)))

Statement	Equation	R^2	F	% Annual Change
Total fava bean yield	$Y_{i1}=200-9.7x$ $(10.6)^{**}(-3.2)$	0.56	10.2	0.67

Where:-

Y_{i1} = Estimated value of total fava bean production in thousand tons per year i

$X\,i$ = time variable where i = 1.2, ... 10.

The numbers in parentheses below the coefficients express the calculated value of (T)

* indicates the significance of the coefficient at the level of significance 0.05.

While ** indicates the significance of the coefficient at the level of significance 0.01 .

% of annual change of the phenomenon = B estimated phenomenon / arithmetic mean * 100

Source: Collected and calculated from the data of Table (1) in the Appendix

Third: The current situation of available for consumption and the average per capita crop of fava beans in Egypt during the period (2010-2019)

By studying the evolution of the quantity available for consumption of fava beans crop in Egypt during the period (2010-2019), Table (2) in the annex shows that there is a significant change in the available for consumption fava bean crop, as the average amount available for consumption of fava bean crop increased from about 395.0 thousand tons in 2010 to about 964.0 thousand tons in 2019, and Table (3) shows the equation of the general time trend of the ratio available for consumption Egypt of the fava bean crop during the period (2019-2010), and the product of the function indicated that the quantity of the ratio Available for consumption of fava bean crop increases annually at a significant By studying the evolution of the quantity available for consumption of fava beans crop in Egypt during the period (2010-2019), Table (2) in the annex shows that there is a significant change in the available for consumption fava bean crop, as the average amount available for consumption of fava bean crop increased from about 395.0 thousand tons in 2010 to about 964.0 thousand tons in 2019, and Table (3) shows the equation of the general time trend of the ratio available for consumption Egypt of the fava bean crop during the period (2019-2010), and the product of the function indicated that the quantity of the ratio Available for consumption of fava bean crop increases annually at a significant rate of about 56.5 thousand tons per year, representing about 1.0% of the annual average of the total percentage available for consumption fava bean crop of about 5598.0 thousand tons, and it was found through the coefficient of determination that time is responsible for 0.61% of the changes that were exposed

to the amount available for consumption of fava bean crop during the period (2010-rate of about 56.5 thousand tons per year, representing about 1.0% of the annual average of the total percentage available for consumption fava bean crop of about 5598.0 thousand tons, and it was found through the coefficient of determination that time is responsible for 0.61% of the changes that were exposed to the amount available for consumption of fava bean crop during the period (2010-2019)

Through Table (2) in the appendix, it was found that the per capita share during the period (2010-2019) ranged between a minimum of about 3.4 kg in 2015, and a maximum of about 7.6 kg in 2019, while the average was about 5.25 kg during the period under study.

Table (3): General Time Trend of **Available Consumption, Average Per Capita Dietary Gap and Self-Sufficiency Ratio of Fava bean Crop in Egypt during the Period (2010-2019)**

Statement	Equation	R^2	F	%Annual Change
Available for consumption of the municipal bean crop	$Yi_1 = 249.2 + 56.5x$ (2.5) **(3.5)**	0.61	12.3	1.0
Average per capita	Morale has not been proven in various sports pictures			
Food gap	$Yi_2 = 115.3 + 49.6x$ (1.0) (3.0)**	0.51	9.5	12.0
% Self-sufficiency	$Yi_3 = 48.7 - 3.1x$ (8.3) (-3.6)**	0.59	12.7	10.2

Where:

$= Y_{i1} =$ Estimated value of total available for consumption of fava bean crop in thousand tons per year i

$Y_{i2} =$ estimated value of the food gap of fava bean crop in thousand tons per year i

$Y_{i3} =$ Estimated value of the sufficiency percentage of fava bean crop in thousand tons per year i

$X\ i =$ time variable where $i = 1.2, ...$ 10.

The numbers in parentheses below the coefficients express the calculated value of (T)

* indicates the significance of the coefficient at the level of significance 0.05.

While ** indicates the significance of the coefficient at the level of significance 0.01 .

% of annual change of the phenomenon = B estimated phenomenon / arithmetic mean * 100

Source: Collected and calculated from the data of Table (3-3)

Fourth: The current situation of the food gap and the percentage of self-sufficiency of fava beans in Egypt during the period (2010-2019)

Table (2) in the annex shows that the food gap in Egypt of fava beans during the period (2010-2019) fluctuated between high and low, and the food gap of fava beans crop during the period (2010-2010) ranged between a minimum of about 161.0 kg in 2010, and a maximum estimated at 863.0 kg in 2018, while the average was about 413.0 kg during the period under study.

Table (3) shows the equation of the general time trend of the food gap in Egypt from the fava bean crop during the period (2010-2019), and the product of the function indicated that the amount of food gap from the fava bean crop increases annually at a statistic significant rate of about 49.6 thousand tons per year, and the annual average of the total food gap for the fava bean crop is about 413.0 thousand tons, and it was found through the determination factor that time is responsible for 51% of the changes that the food gap was exposed to during the period (2010-2019)

The data in Table (2) in the appendix indicate that the percentage of self-sufficiency in Egypt from the fava bean crop during the period (2010-2019) ranged from a maximum of about 59.2% in 2010, and a minimum of about 10.5% in 2019.

Table (3) shows the equation of the general time trend of the percentage of self-sufficiency in Egypt of the fava bean crop during the period (2010-2019), and the product indicated that the percentage of self-sufficiency of the fava bean crop decreases annually at a significant rate estimated at 3.1% annually, representing about 10.2% of the annual average of the total percentage of self-sufficiency of the fava bean crop in Egypt , which is about 30.3% It was found through the coefficient of determination that time is responsible for 59% of the changes that were exposed to the percentage of self-sufficiency of the fava bean crop during the period (2010-2019)

Fifth: The development of the current situation of Egypt's imports of fava beans crop during the period (2010-2019)

By studying the development of imports of fava beans crop in Egypt during the period (2010-2019), Table (1) in the annex shows that there is a significant boom in imports of fava beans, as the average amount of imports increased from about 179.0 thousand tons in 2010 to about 892.0 thousand tons in 2019, and Table (4) The equation of the general time

trend of Egypt's imports of fava beans crop during the period (2010-2019), and the product indicated that the amount of imports of fava beans increases annually at a statistically significant rate of about 69.5 thousand tons, representing about 1.6% of the annual average of the total imports of fava beans crop of about 4361.0 thousand tons, and it was found through the determination factor that time is responsible for 72% of the changes that imports were exposed to from Fava bean crop during the period (2010-2019)

Sixth: The development of the current situation of Egypt's exports of fava beans crop during the period (2010-2019)

By studying the development of fava bean exports in Egypt during the period (2010-2019), Table (1) shows that there is a significant boom in fava bean exports, as the average amount of fava bean exports fluctuated from about 3.0 thousand tons in 2011 to about 55.0 thousand tons in 2017, and Table (4) The equation of the general time trend of Egypt's exports of fava beans crop during the period (2010-2019), and the product of the function indicated that the amount of exports of fava beans increases annually at a significant rate of about 4.3 thousand tons per year, representing about 1.5% of the annual average of the total exports of fava beans of about 232.0 thousand tons, and it was found through the coefficient of determination that time is responsible for 47% of the changes that exports were exposed to from Fava bean crop during the period (2010-2019)

Table (4): Overall Time Trend of Imports and Exports of Fava beans Crop in Egypt during the Period (2010-2019)

Statement	Equation	R^2	F	%Annual Change
Total imports of municipal beans crop	$Y_{i1}=53.8+69.5x$ $(0.56)^{*} (4.5)^{**}$	0.27	20.3	1.6
Total exports of municipal beans	$Y_{i2}=4.3+3.4x$ $(0.54) (2.7)^{**}$	0.47	7.3	1.5

Where:-

Y_{i1} = Estimated value of total imports of fava beans crop in thousand tons per year i

Y_{i2} = Estimated value of total exports of fava beans crop in thousand tons per year i

X i = time variable where i = 1.2, ... 10.

The numbers in parentheses below the coefficients express the calculated value of (T)

* indicates the significance of the coefficient at the level of significance 0.05.

While ** indicates the significance of the coefficient at the level of significance 0.01 .

% of annual change of the phenomenon = B estimated phenomenon / arithmetic mean * 100

Source: Collected and calculated from the data of Table (3-4)

Seventh: Statistical estimation of the economtic model of fava beans in Egypt.

1- Production equation.

$$Y_{1T} = 1.6 + 0.43X_{1T} + 2.02Y_{2T} - 1.49Y_{3T}$$

(0.6) (0.5) (3.6)** (-4.5)**

F=6.7 R^2=0.67

 The actual values of the quantity produced of fava beans Y 1T (dependent variable), the quantity available for consumption of fava beans Y 2T, and the quantity of imports of fava beans Y 3T were used. The farm price of fava beans is divided by the farm price of sugar beet X_{1T}, rather than the estimated values of each to improve them in the model result as the actual values did not differ significantly from the estimated values.

The estimates of the production equation show that there is a statistically significant positive relationship between the total production of fava beans and the farm price of fava beans divided by the farm price of sugar beet, where the total production increases by about 0.34 thousand tons for each increase in and the farm price of fava beans divided by the farm price of sugar beet, and the equation indicates a statistically significant positive relationship between the total production of fava beans and the amount consumed by it, where production increases by 2.02 thousand tons per An increase in consumption, and the existence of a statistically significant inverse relationship between the total production of fava beans and imports of fava beans, where the amount of production of fava beans decreases by 1.49 thousand tons for each increase in imports, and changes in these variables are explained by about 67% of the changes in the amount produced of fava beans during the period (2006-2019).

2- Consumption equation.

$$Y_{2T} = 3.8 - 0.15X_{2T} + 0.63Y_{3T}$$

(5.6)** (-2.3)* (7.3)**

F =27.2 R^2 =0.83

The actual values of both the quantity available for consumption of fava beans Y 2 T (dependent variable), and the quantity of imports of fava beans Y 3T were used. , and the retail price of fava beans X_{2T}, instead of the estimated values of each to improve them in the model result as the actual values did not differ much from the estimated values.

The estimates of the consumption equation show that there is a statistically significant inverse relationship between the available for consumption of fava beans and the retail price of

fava beans, where the available for consumption increases by about 0.15 thousand tons for each increase in the retail price of fava beans by a pound, and the equation indicates a statistically significant positive relationship between the available for consumption of fava beans and the amount of imports from it, where consumption increases by 0.63 thousand tons for each increase in the amount of imports, and the coefficient of determination indicates that these variables Responsible for 83% of the changes in the amount of available consumption of fava beans during the period (2006-2019).

3- imports equation.

$$LnY_{3T} = -0.69 - 0.094LnX_{3T} - 0.049LnY_{2T} + 1.4\, LnY_{2T}$$

$$(-0.5)\ \ (-1.5)\ \ (-5.0)^{**}\ \ (10.8)^{**}$$

F= 0.93   R =44.6

The actual values of the import quantity of Y3T beans, the amount produced of Y 1T, the quantity available for consumption of Y2T, and the price of Britain X3T, were used instead of the estimated values of each to improve them in the result of the model as the actual values did not differ significantly from the estimated values. The estimates of the import equation show that there is an inverse relationship between the amount of imports of municipal beans and the price of Britain, where the amount of imports decreases by about 0.094 for each increase in the exchange rate, and the equation indicates a statistically significant inverse relationship between the amount of imports of municipal beans and the amount produced of municipal beans, where the amount of imports decreases by 0.49 per increase and the amount produced of municipal beans, and the existence of a statistically significant positive relationship between the amount of imports of municipal beans and Ki. Available for consumption, where the amount of imports of municipal beans increases by 1.4 per increase in the quantity consumed, and changes in these variables are explained by about 93% of the changes in the amount produced of municipal beans during the period (2006-2019).

Eighth: Predicting the behavior of model variables until 2030.

Scientific forecasting of the behavior of economic phenomena is one of the most important goals of econometrics, as scientific forecasting is only a quantitative estimate of the expected values of dependent variables in the near future based on what is available to us from the information about the past and present, and scientific forecasting assumes that the behavior of economic phenomena in the near future is only an extension of the behavior of these phenomena in the recent past, and then the occurrence of sudden changes that were not expected can lead to inaccuracy Scientific predictions for the future of economic phenomena, and the methods of forecasting vary according

to the models used, there is a scientific prediction using a single equation model, and there is a scientific prediction using a multi-equation model, which will be focused on in this part of the research.

When reviewing the results of predicting the values of the model variables, the goal of making any standard model is to predict it for a future period.

Table (5) shows the expected values of the variables of the simultaneous model, which are (the amount of fava beans produced Y_{1T}, and the amount available for consumption of fava beans Y_{2T}., the amount of imports of fava beans Y_{3T}) during the period (2006-2019). As it is expected that the volume of production of fava beans crop will decrease from about 95.4 thousand tons in 2020 to about 12.2 thousand tons in 2027, as for the volume of consumption of fava beans crop, it is expected to increase from about 703.3 thousand tons in 2020 to about 824.0 in 2027, and the volume of imports of fava beans is expected to increase from about 597.1 in 2020 to about 790.1 in 2027.

The tables also show the expected values of the actual values under study using the general trend equations, which are (the amount of fava beans produced Y_1, the amount available for consumption of fava beans Y_2, the amount of imports of fava beans Y_3) during the period (2006-2019). As it is expected that the volume of production of fava beans crop will decrease from about 73.7 thousand tons in 2020 until we reach non-production in 2027, as for the volume of consumption of fava beans crop, it is expected to increase from about 688.6 thousand tons in 2020 to about 794.3 in 2027, and the volume of imports of fava beans is expected to increase from about 631.9 in 2020 to about 827.3 in 2027.

By comparing the results of the forecast using the simultaneous model by predicting using the general direction equations, the credibility of the results of the model is shown, as it is estimated by estimating the standard deviation of the variables under study (the amount produced of fava beans Y_{1T}, the amount available for consumption of fava beans Y_{2T}, the amount of imports of fava beans Y_{3T}) during the period (2006-2019) were 29.1, 42.1, 67.6, respectively using the simultaneous model and were 36.0, 37.0, 68.3, respectively using the general direction equations. One of the results of the estimation is the forecasting of fava bean models that production is deteriorating from year to year and the same is the case for the general trend forecast at a time when the expected consumption values of municipal beans are increasing from year to year in a direction that doubled consumption during recent years, which leads to the collapse of bean cultivation in general and dependence entirely on imports, and these results need to be taken into account when developing production and marketing policies for the bean crop in Egypt..

Table (5) Predicting the actual values of variables using the equations of the simultaneous model and the equations of the general time trend of fava bean crop in Egypt until 2027.

Years	General Time trend prediction			simultaneous equations model		
	Output volume	Volume of consumption	Volume of imports	Output volume	Volume of consumption	Volume of imports
2020	73.7	688.6	631.9	95.4	703.3	597.1
2021	59.0	703.7	659.8	83.5	720.9	624.6
2022	44.3	718.8	687.7	71.6	737.6	652.2
2023	29.6	733.9	715.6	59.8	755.3	679.8
2024	14.9	749.0	743.5	47.9	771.9	707.4
2025	0.2	764.1	771.4	36.0	789.6	735.0
2026	-14.5	779.2	799.3	24.1	806.2	762.5
2027	-29.2	794.3	827.2	12.2	824.0	790.1
growth rate		0.0%	0.0%	-2.2%	0.0%	0.0%
Standard deviation	36.0	37.0	68.3	29.1	42.1	67.6

| Source: Calculated from the results of the general trend prediction and the results of the simultaneous model.

Summary

The result of the function showed that the amount of production of fava beans decreases annually at a statistic significant rate of about 9.7 thousand tons per year, representing about 0.67% of the annual average of the total production of fava beans crop of about 1468.0 thousand tons of fava beans crop during the period (2010-2019) and the product of the function indicated that the amount of percentage available for consumption

of fava beans increases annually at a statistic significant rate of about 56.5 thousand tons per year, representing about 1.0% of the annual average. For the total percentage available for consumption fava bean crop of about 5598.0 thousand tons of fava bean crop during the period (2010-2019) and it was found that the average per capita share of fava beans crop during the period (2019-2010), ranged between a minimum of about 3.4 kg in 2015, and a maximum estimated at 7.6 kg in 2019, while the average was about 5.25 kg during the period under consideration.), and the product of the function indicated that the amount of food gap of fava bean crop increases annually at a statistic significant rate of about 49.6 thousand tons per year, and the annual average of the total nutritional gap of leguminous seed crops of about 413.0 thousand tons

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Supplements

Table (1): Evolution of production, imports, exports, available for consumption, and average per capita fava bean crop in Egypt during the period (2010/2019).

%	Average per capita	Pure food	Lost	Seeds	Animal food	%	For available for consumption	%	Exports	%	Imports	%	For domestic production	Years
7.4	3.9	305.0	20.0	7.0	74.0	7.1	395.0	7.8	18.0	4.1	179.0	15.9	234.0	2010
8.6	4.5	381.0	24.0	8.0	56.0	8.4	469.0	1.3	3.0	6.8	297.0	11.9	175.0	2011
6.5	3.4	280.0	18.0	6.0	44.0	6.5	363.0	6.5	15.0	5.4	237.0	9.6	141.0	2012
13.9	7.3	389.0	27.0	20.0	112.0	10.1	568.0	6.5	15.0	9.7	425.0	10.8	158.0	2013
10.7	5.6	295.0	20.0	5.0	60.0	7.1	396.0	6.9	16.0	6.4	280.0	9.1	134.0	2014
6.5	3.4	455.0	19.0	6.0	46.0	6.9	387.0	5.2	12.0	6.4	279.0	8.2	120.0	2015
9.1	4.8	441.0	28.0	9.0	68.0	10.2	569.0	15.5	36.0	11.1	484.0	8.1	119.0	2016
8.6	4.5	429.0	27.0	9.0	66.0	9.9	554.0	23.7	55.0	10.0	438.0	11.6	170.0	2017
14.3	7.5	732.0	45.0	15.0	111.0	16.7	933.0	14.2	33.0	19.5	850.0	7.9	116.0	2018
14.5	7.6	756.0	81.0	16.0	80.0	17.2	964.0	12.5	29.0	20.5	892.0	6.9	101.0	2019
100.0	52.5	4463.0	309.0	101.0	717.0	100.0	5598.0	100.0	232.0	100.0	4361.0	100.0	1468.0	Total
10	5.25	446.3	30.9	10.1	71.7	10	559.8	10	23.2	10	436.1	10	146.8	Average

Source: The Central Agency for Public Mobilization and Statistics (CAPMAS), the movement of production, foreign trade and available for consumption of agricultural commodities, collected and calculated in different numbers.

Table (2): Evolution of Consumption Availability, Average Per Capita, Food Gap and Self-Sufficiency of Fava bean Crop in Egypt during the Period(2019-2010)

Quantity: Tons

Years	For domestic production	Disposable for consumption	Food gap	Average per capita	Self-sufficiency
2010	234.0	395.0	161.0	3.9	59.2
2011	175.0	469.0	294.0	4.5	37.3
2012	141.0	363.0	222.0	3.4	38.8
2013	158.0	568.0	410.0	7.3	27.8
2014	134.0	396.0	262.0	5.6	33.8
2015	120.0	387.0	267.0	3.4	31.0
2016	119.0	569.0	450.0	4.8	20.9
2017	170.0	554.0	384.0	4.5	30.7
2018	116.0	933.0	817.0	7.5	12.4
2019	101.0	964.0	863.0	7.6	10.5
Average	146.8	559.8	413.0	5.3	30.3

Source: Collected and calculated by the Central Agency for Public Mobilization and Statistics (CAPMAS), movement of production, foreign trade and available for consumption of agricultural commodities, different numbers.

Table (3): Evolution of production, imports, available for consumption, bean price during the period (2006-2019).

Years	Production quantity	Disposable for consumption	Imports	Beet farm price	Farm price for beans	Bean Retail Price	Exchange rate	Population
2006	257	595	459	172.0	2169.0	3.3	5.7	78232.1
2007	305	591	301	187.5	2267.0	3.5	5.6	79636.1
2008	244	847	655	231.0	3823.0	5.5	5.4	81134.8
2009	298	425	146	317.0	3697.0	5.1	5.5	82761.2
2010	234	395	179	263.0	3717.0	5.2	5.6	84529.3
2011	175	469	297	355.0	3858.0	7.8	5.9	86422.2
2012	141	363	237	364.0	4671.0	8.3	6.1	88404.6
2013	158	568	425	387.0	4755.0	9.0	6.9	90424.7
2014	134	396	280	370.0	4871.0	10.2	7.1	92442.5
2015	120	387	279	379.0	5239.0	10.7	7.7	94447.1
2016	119	569	484	379.0	5302.0	15.3	10.0	96442.6
2017	170	554	438	534.0	6452.0	17.2	17.8	98423.6
2018	116	933	850	540.0	10902.0	20.3	17.8	98902.0
2019	101	964	892	625.0	11738.0	29.0	16.8	99848.7

Source: Compiled and calculated by the Central Agency for Public Mobilization and Statistics (CAPMAS), Movement of Production, Foreign Trade and Available for Consumption of Agricultural Commodities, Annual Price Bulletin of Resources, Food Products and Services (Producer/Wholesale/Consumer), Various Issues. Annual Statistical Book - Population - Part Two.