

AN ECONOMIC ANALYSIS OF THE FACTORS AFFECTING EGGS IMPORTING IN IRAQ FOR THE PERIOD (2003 – 2018)AND PREDECTION THE EGGS IMPORTING FOR THE PERIOD (2019 – 2025)

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ABSTRACT

This study aimed to determine the most important factors affecting importing of table eggs in Iraq for the period 2003 - 2018. To achieve the objectives the analysis phase was divided into two parts, the first was to measure factors affecting the importing of table eggs in order to obtain a mathematical relationship between the dependent variable (imports) and the independent variables represented by the local price of table eggs and the price limits for table eggs, the exchange rate, the national income, the population, the local production of table eggs, and the number of table egg projects. The second stage was to predict for the period (2019-2025) using the simple regression method. The results showed that the continuous increase in the population will lead to an increase in the imported quantities of table eggs due to the increase in consumer demand for this product eggs, Most estimated parameters of importing function were significant at 5%. The highest expected amount of imported table eggs (10056 million eggs) on 2025, while the lowest amount (7631.36 million eggs) on 2019. It can be concluded that there is no government policies in subsidizing production inputs and supporting the final product. The study recommended for a policy to protect domestic products from foreign competition.

Key words: table egg production projects, ordinary lest square, prediction, simple regression.

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فوزي والواسطي

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تحليل اقتصادي لأهم العوامل المؤثرة على استيراد بيض المائدة في العراق للمدة (2003 – 2018) والتنبؤ بالاستيراد للمدة (2019 – 2025)

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باحث

مديرية زراعة واسط

المستخلص

هدف البحث الى تحديد أهم العوامل المؤثرة على استيراد بيض المائدة في العراق للمدة (2003 – 2018). وتحقيقاً لأهداف البحث قسمت مرحلة التحليل الى قسمين الأولى هي قياس العوامل التي تؤثر على استيراد بيض المائدة وذلك للحصول على علاقة رياضية تربط بين المتغير المعتمد (الاستيرادات) والمتغيرات المستقلة المتمثلة بسعر المحلي لبيض المائدة وسعر الحدود لبيض المائدة وسعر الصرف والدخل القومي والسكان والإنتاج المحلي لبيض المائدة وعدد مشاريع بيض المائدة اما المرحلة الثانية هو التنبؤ بالاستيرادات للمدة (2019-2025). بينت النتائج ان الزيادة المستمرة في عدد السكان ستؤدي الى زيادة في الكميات المستوردة من بيض المائدة بسبب الزيادة في الطلب الاستهلاكي على هذا المنتج ، وكانت معظم المعلمات المقدرة للدالة الكميات المستوردة عند 5%. وكانت اعلى كمية متوقعة لاستيراد بيض المائدة في سنة (2025) وبالبالغة (10056) مليون بيضة ، في حين كانت اقل كمية في سنة (2019) وبالبالغة (7631.36) مليون بيضة. وتوصل البحث الى عدة استنتاجات ابرزها قصور السياسات الحكومية في اعانة مدخلات الإنتاج ودعم المنتج النهائي. وأوصى البحث بضرورة إيجاد سياسة لحماية المنتج المحلي من المنافسة الأجنبية .

الكلمات المفتاحية: مشاريع انتاج بيض المائدة، طريقة المربعات الصغرى الاعتيادية، التنبؤ، الانحدار البسيط .

*البحث مستل من رسالة الماجستير للباحث الأول.

INTRODUCTION

The economic system in many developing countries is characterized by the lack of food, and the reason for this is the increment in the population at a higher rates higher than the agricultural production increment, as well as the effect of other factors that characterize the economies of developing countries, the most prominent of which are the decline of the prevailing production systems, which lead to decline the quantity and quality of the production, and produces an increment sizes and values of imports of agricultural products (13). In light of the economic features and developments that began to appear world widely, especially with the increment towards the economic groups and the towards liberalizing international trade , perhaps the most prominent of which are the global crises in food and energy, this had a clear impact on Iraq in terms of its impact on the agricultural development process (22). The importance of foreign trade in the economies of different countries around world is due to the difficulty of dispensing any country from the rest of the world, regardless of their level of development and to live in isolation from the outside world and that developing countries vary in terms of natural or relative and absolute advantages that are specialized in producing certain types of goods and they works to export the surplus out of it, which allows them to cover the other imported goods (20). Therefore, the attention has turned to the interest in poultry projects and through their main products, chicken and eggs to meet the consumer's needs (11). Despite those economic and nutritional importance of table egg , production projects and their increasing demand, the local production is still under the required level that achieves self-sufficiency, as it covers only (45.7%) of its local consumption, which relied heavily on import to secure the requirements of individuals, as the amount of imports reached about (48.8) thousand tons (7). The economic problem will be exacerbated by an appropriate agricultural policy that increases domestic production and development, rationalizes consumption, meets the community's need, and achieves food security self-sufficiency (17). Determining the right policies for importing requires determination

of the consumption and production policies, because importing in the case of abundant production has negative effects on local production in the future, importing policies should not be long-term, but there must be efforts to achieve high levels of self-sufficiency and thus achieve food security from food commodities. It's a good policy is to maintain a balanced geographical distribution of the countries from which food commodities were imported, so that the state would not be under any kind of pressure (5). The methods should also be used to combat the dumping of Iraqi markets with imported products in order to avoid the impact of dumping (12). The state should adopt programs or policies concerned with achieving certain goals, the most important of which is to motivate producers to increase production (21) Table eggs are considered as a basic food for human because they contain important nutrients, as the percent of protein per egg is 12%. This protein is considered as the finest types of natural proteins (1). Despite these economic and nutritional importance of table egg , the local production is still under the dose not achieve self-sufficiency, as it covers only (45.7%) of local demand, Thus, the country relied heavily on importing to secure the requirements of local markets . This is a major threat to food security on the one hand and negatively affects the trade balance and drains the hard currency on the other hand, due to the deterioration of the production of table eggs, especially after 2003 (23). The economic problem will be exacerbated by an appropriate agricultural policy. The importance of research lies in identifying a set of factors that play an important role in importing table eggs , therefore, the current study aimed to estimate the function of importing table eggs using the multi-regression method , the research is based on the hypothesis that there are factors affecting the import of table eggs .

MATERIALS AND METHODS

The logic of economic theory depends on determining the relationship between the variables involved in the model and the prior expectations about the sizes and sign of the estimated parameters which are considered as a theoretical test depends on it in evaluating the results (10). This study was related to the

importing of table eggs in Iraq as an analytical study of independent factors for the period 2003 - 2018. This research adopted various sources, Ministry of Planning / Central Bureau of Statistics and the data of the Central Bank of Iraq , The research assumed that there are some independent variables that affect the quantities of imported table eggs; these variables were (local price of table eggs, external price of table eggs, exchange rate, national income, population, domestic production of table eggs, and number of projects of table eggs), The study relied on a time series of sixteen years during the period 2003-2018 for the purposes of estimating and analyzing, and to derive the model using the multi-slope method in the ordinary least squares (OLS) .

Description of the econometric model used specification

the model is part of the components of most sciences, because the relationships that control the phenomena are usually very complex if they are taken in their real form under their actual reality, and the model is a tool to represent a specific phenomenon in a way that highlights the prevailing relationships in it and towards the service of goals and in proportion to the available capabilities and when the phenomenon concerned is an economic phenomenon (2). The economic model is defined as a system of relations between economic variables whose purpose is to facilitate the description of the nature of those relationships in a manner free of details and close to reality (9). While the econometric model, is an economic model that includes theoretical relationships represented mathematically, in addition to the random variable (16). Thus the economic theory remains the starting point for the econometric studies, and the experimental scale remains a tool to demonstrate the extent to which the variables conform or deviation from the assumptions of economic theory, this helps the researcher to form a clear vision of the impact of economic variables and helps policy makers in determining the optimal economic policy

(19), The construction of the economic model needs to go through several stages, First of all is the stage for specification and formulating the model, the testing phase, and finally the application and forecast stage. (8). Estimating the parameters that we obtain using a specific econometric economic method can have some desirable characteristics, and the extent to which these characteristics are achieved depends on the extent to which the assumptions for this method are fulfilled (18).

RESULTS AND DISCUSSIONS

In order to estimate the function of importing table eggs in Iraq during the study period, the imported quantity was approved as a dependent variable, while local price of table eggs, external price of table eggs, exchange rate, national income, population, Total production of table eggs, and the number of table eggs projects in Iraq were independent variables , The half logarithmic model was able to outperformed to express the relationship between the dependent variable and the independent variables, as follows:

$$y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln x_3 + b_4 \ln x_4 + b_5 \ln x_5 + b_6 \ln x_6 + b_7 \ln x_7 + u_i$$

Y: Quantities of imported table eggs (thousand eggs)

$\ln X_1$ = Natural logarithm of the local price for table eggs (dinars per thousand eggs) =

$\ln X_2$ = Natural logarithm of the external price of table eggs (dinars per thousand eggs)

$\ln X_3$ = Natural logarithm of the exchange rate (dinars / dollars)

$\ln X_4$ = Natural logarithm of national income at current prices (million dinars)

$\ln X_5$ = Natural logarithm of the population (million people)

$\ln X_6$ = Natural logarithm of the local production of table eggs (a thousand eggs)

$\ln X_7$ = Natural logarithm of the number of table eggs projects (project)

Several mathematical models have been experimented with logarithm formula gave the best results that passed statistical and econometric tests. The estimated results were consistent with the logic of economic theory. The results came as follows:

Table 1. Egg importing function

Dependent Variable: Y				
Method: Least Squares				
Date: 01/09/20 Time: 23:58				
Sample: 2003 2018				
Included observations: 16				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	68909579	53359520	1.291421	0.2326
LNx1	-2625470.	5011983.	-0.523839	0.6146
LNx2	1398683.	1724073.	0.811266	0.4407
LNx3	-5829917.	5683529.	-1.025757	0.3350
LNx4	8626550.	3112357.	2.771710	0.0242
LNx5	-40913095	15572818	-2.627212	0.0303
LNx6	-495806.3	1738670.	-0.285164	0.7828
LNx7	-4184732.	1359352.	-3.078476	0.0152
R-squared	0.855190	Mean dependent var	4196462.	
Adjusted R-squared	0.728481	S.D. dependent var	2661083.	
S.E. of regression	1386623.	Akaike info criterion	31.42949	
Sum squared resid	1.54E+13	Schwarz criterion	31.81579	
Log likelihood	-243.4360	Hannan-Quinn criter.	31.44928	
F-statistic	6.749253	Durbin-Watson stat	2.202638	
Prob(F-statistic)	0.007594			

Source: Calculated using E-views . 10

The results of estimating the function of importing table eggs revealed , through the value of the coefficient of determination R^2 , which was (85%), it is clear that the changes in the imported quantity of table eggs were explained by the variables included in the model, while the remaining percent (15%) It is attributed to other factors that were not included in the estimated function or absorbed by the random variable effect. The calculated value of F (6.75) showed the significance of the model statistically by comparing it with the tabulated F (3.50) and at the level of significance (5%) . which means that the

independent variables have a significant effect on the dependent variable and that the estimated model as whole was statistically significant. As for the econometric tests, the value of (DW) reached (2.20) which indicated that there is no problem of autocorrelation between random errors because the value is limited to 0.269 and 2.416 . According to the Klein test, we find that the value of the square root of the coefficient determination (R^2) exceeded the values of simple correlations between the two variables, and this means that there is no multicollinearity problem.

Table 2. Correlation matrix for table egg importing function

	LNx1	LNx2	LNx3	LNx4	LNx5	LNx6	LNx7
LNx1	1	0.84328759...	-0.4249429...	0.85993100...	0.76509278...	0.75875084...	-0.2558747...
LNx2	0.84328759...	1	-0.4888297...	0.61257676...	0.52183218...	0.69683712...	-0.0423385...
LNx3	-0.4249429...	-0.4888297...	1	-0.5682009...	-0.6296536...	-0.5395119...	0.25223007...
LNx4	0.85993100...	0.61257676...	-0.5682009...	1	0.92857971...	0.83110791...	-0.3184717...
LNx5	0.76509278...	0.52183218...	-0.6296536...	0.92857971...	1	0.67498270...	-0.5721799...
LNx6	0.75875084...	0.69683712...	-0.5395119...	0.83110791...	0.67498270...	1	0.08549984...
LNx7	-0.2558747...	-0.0423385...	0.25223007...	-0.3184717...	-0.5721799...	0.08549984...	1

Source: Calculated using E-views 10

As for the ARCH test; the probabilistic values reached (0.755 and 0.733) which were greater than (0.05), which is accepted and there is no

problem in instability of variance (Heteroskedasticity).

Table 3.ARCH test for Heteroskedasticity import

Heteroskedasticity Test: ARCH			
F-statistic	0.101145	Prob. F(1,13)	0.7555
Obs*R-squared	0.115805	Prob. Chi-Square(1)	0.7336

Source: outputs based on E-views 10

from the parameters of the estimated model it was found that the parameter of the local price of table eggs came negative (26254.7) to indicate the contrary relationship between the

local price of table eggs and the quantity imported from it. This came in line with the economic theory (the existence of an inverse relationship between them) when the market is flooded with a table egg product, this affects

the local price of eggs and therefore leads to a decrease in it. As for the external price for table eggs, its signal was positive (13986.83) to indicating the direct relationship between the external price of table eggs and the quantity imported, The contradicts the economic theory (the existence of an inverse relationship between them) that is, when the international price of table eggs rises, the quantities imported from it decrease, The results of showed a negative signal reached (58299.17) to indicating the inverse relationship between the exchange rate and the quantity imported from the table eggs This is in line with the economic theory (an inverse relationship between them) that is, when the exchange rate rises, the imported quantities of table eggs decrease and vice versa .While the national income parameter showed a positive signal and reached (86265.5) which indicated the direct relationship between national income and the quantity imported from table eggs This is in accordance with economic theory (a positive relationship between them), that is increasing national income leads to an increase in the imported quantities of table eggs and vice versa . The population number showed a negative sign and reached (409130.95) which indicated the inverse relationship between the population and the quantity imported from table eggs This is also inconsistent with the economic theory (a positive relationship between them), and the reason for that may be due to the turnout of consumers to buy local eggs instead of the imported eggs. As for the domestic production of table eggs, it was showed a negative sign reached (495806) which indicated the inverse relationship between the local production of table eggs and the quantity imported from table eggs . This is came with the economic theory (an inverse relationship between them), that is when domestic production of table eggs increases, imported quantities decrease, while projects of table eggs gave a negative signal and reached (41847.32) which indicated the inverse relationship between the number of table eggs projects and the quantity imported from table eggs. This is in consistent with economic theory (an inverse relationship between them), that is when the number of

table egg projects is increased, the imported quantities of table eggs will be reduced.

PREDICTION

The prediction is the analysis of past data and the application of its results to the future through the use of a suitable mathematical model (6). The prediction has taken many concepts; it is a scientific method that helps economic and non-economic decision makers in making their future decisions. It may also be known to predict that it is an extrapolation and investigation of what may happen in the future to the phenomenon through repeated incidents of the past (15). A prediction can also be defined as an estimate of the value of a variable or certain variables if certain conditions are met, and from this definition it is evident that the researcher must have an idea of the relationship that links these conditions to the variables that are subject to prediction and that from the reality of past observations and his analysis of these observations by visualizing the relationship between them in equations consistent with the mathematical forms that the researcher considers appropriate for them or by using statistical methods related to estimation from the reality of samples (14).

the most prominent methods of prediction are:

1- General direction method: - In order to prepare forecasts for years to come, the annual trend of changes in a particular commodity must be known according to this method

2- The income elasticities method: This method is the best in estimating, especially for agricultural products. The income elasticity is the relative change that occurs in consumption due to the relative change in income. When using this method, there must be some assumptions which are:

a. Population growth assumptions

B. Income growth assumptions

C. Assumptions that price variables do not affect consumption due to the unpredictability of future price changes as they are subject to multiple factors. Preparing forecasts according to this method requires knowing the average annual per capita consumption for the base year that should be close to the years for which expectations are to be prepared. The formula used according to this method is:

$$Y = Y_{t-1}(1+E*Y)$$

Yt: Average consumption in the comparison year

Yt-1: Average consumption in main year

E: Internal elasticity

Y: Income growth rate. Also, there is another formula that relies on income elasticities, and by which expectations can be found using the annual rate of increase of consumption resulting from this formula:

$$Mc = Mx + E(My - Mx)$$

Mc: Annual growth rate of consumption

Mx: Population growth rate

My: Individual income growth rate

E: Internal demand elasticity

Simple regression method: This method depends on the prediction procedure for the dependent variable depending on the independent variable (passing by statistical and economic tests) (4). Prediction is one of the main methods of drawing economic policies of the country, and it is possible through it setting a specific successful policy for the commodity that is expected, to protect the country from the crises that contribute to the disruption of the national economy, and therefore it is believed that the accuracy of the prediction will help the planner to overcome the crises that the country may be exposed to

as a result of wars and natural disasters (3). The imported quantities of table eggs were predicted in a simple regression method:

$$Y = b_0 + B_1 X$$

Where

Y: The predicted value of the dependent variable

X: The expected value of the explanatory variable in the predict period. The expected values of the explanatory variable were calculated through a relationship between the explanatory variable and time, and the best explanatory variable was chosen among the other explanatory variables that were passed for statistical and economic tests.

$$Y = -13248002.7 + 539867X$$

$$T(-2.957)(3.916)$$

$$R^2 = 0.52, F = 15.332$$

Where

Y: Represents the predictive value of the dependent variable (quantities imported of table eggs)

X: The expected value of the explanatory variable, which is the population variable

The expected values for the imported quantities of table eggs were obtained as shown in table 4.

Table 4. Expected quantities of importing table eggs in Iraq for the period (2019-2025).

Importing of table eggs (million eggs)	Years
7631.36	2019
8035.47	2020
8439.58	2021
8843.68	2022
9247.79	2023
9651.90	2024
10056.007	2025

Source: Calculated using spss

It is clear from table 4 that the predicted quantities are constantly increasing in the quantities imported from table eggs, as the amount in 2019 reached (7631.36) million eggs, and in 2022 reached (8843.68) million eggs, while in 2025 reached (10056.007) million eggs. This research proved that the increase in the imported quantities of table eggs (flooding Iraqi markets with imported products) at a low price led to forcing the Iraqi producer of table eggs to sell at a low price and not competing for imported goods to the lack of government support for these as well as the high production requirements. However, where is the concluded in recent years; Iraq's production of table eggs increased, but it was not self-sufficient and its import remained

high, the study also found that there are fluctuations in the import of table eggs in Iraq. Based on the above-mentioned result, the research recommended the necessity of finding a policy to protect the local product from foreign competition in accordance with a policy established by the state, such as imposing restrictions on imported products (applying the agricultural quarantine system) to support the local product and compete with foreign goods and every measures should be taken to reduce the negative effects dumping policy to which the local product is exposed, also the research recommended to follow a policy of supporting domestic production of table egg projects through supporting output prices and subsidizing input prices so that price levels are taken into consideration in the

global market and input prices in the local market and the allocation of certain amounts to support production requirements.

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