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Research Article

Economic Impact of Exchange Rate on the Importation Requirements of Dairy Industry in Egypt

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Abstract

Background and Objective: The exchange rate for the currency of any country is the most important factors affecting economic activity. The food manufacturing sector for dairy products depends on some of the imported production inputs, mainly milk powder, protein concentrates, emulsifiers, salts and gelatin. Focus on the devaluation the value, of the Egyptian pound against other currencies, especially the US dollar (\$) and its impact on the import of production requirements for the dairy industry. The study aims to measure the indicators of Egyptian imports and geographical distribution of the major exporting countries and the most important factors affecting these imports. **Materials and Methods:** To achieve the descriptive and quantitative economic analysis of multi-linear regression and logarithmic by SPSS. **Results:** The value of the Egyptian pound against the dollar has taken a decreasing trend and a statistical significance difference ($p \leq 0.01$) of an annual decline of about 133.4 thousand tons, (2.5% of the total average). New Zealand was ranked first among the leading exporters of milk powder to the Egyptian market, while the Netherlands ranked first for the major exporters of protein and emulsifiers for the market. As for the exporters of gelatin to the Egyptian market, Brazil is ranked first. The model used has a proved significant statistical difference at ($p \leq 0.01$). The exchange rate of the pound and the producer price index are the most important factors influencing the quantity of Egyptian imports of powdered milk and protein concentrate. **Conclusion:** Replacing local products instead of imports leads to increased production. This encourages factories to work, as well as, focus on localization for manufactories specially the protein concentrates used in the food industry.

Key words: Dairy products, exchange rate, Egyptian pound, US dollar, production requirements

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

The exchange rate for the currency of any country was the most important factor influencing economic activity in all sectors and areas, especially on foreign trade sector in exports and imports, price levels, level of real income and all areas of economic life¹. The fallout from the dollar-pound prices on the consumer side had worst consequences on the Egyptian economy, which affects directly on the social aspect and the living conditions of citizens, especially the middle and lower class. Because of expected high inflation and rising prices of various products, such as imported component of food products, importing goods and the cost of imported inputs thus raised the cost of living¹.

The agricultural sector is an important economic sectors in Egypt, contributes approximately 11.5% of gross domestic product (GDP), productivity sectors are highly sensitive to exchange rate, both in terms in the prices of some production requirements or even a change in the price of the final product.

Dairy is one of the components of the agricultural sector which considered as the main source of the Egyptian income. It also represents the most complete and balanced food for human needs because they contain many nutrients and vitamins in addition to being a food that protect the body from many diseases. Dairy production was about 25 billion pounds in 2015, representing 20.8% of the total animal production, while the average annual per capita dairy was about consumption 72.9 kg.

Dairy industry is of great importance as it works to provided the important food products like pasteurized milk, white cheese, cooked cheese, yogurt, ice cream and butter. Dairy production increased approximately 224.5 thousand tons in 2004 to about 593.8 thousand tons in 2012, as the value of the production of dairy products increased from about 1292.3 million pounds in 2003 to 8837.7 million pounds 2012². The dairy manufacturing sector relied on some of imported production inputs, mainly milk powder, protein concentrates, emulsifying salts and gelatin.

In the past decades, the Egyptian pound has passed over different stations, after each station the Egyptian pound lost part of its value gradually for many reasons. The pound exchange rate superposed the dollar in the official market at 8.8 pounds in December, 2016, then rose to 13 pounds in November during the same year compared to 5.90 in August 2011, followed those changes increased the size of the gap between the official and parallel price to the dollar on the black market despite the efforts made by the Central Bank to control those changes. As well as, increases the severity of the

decline in the value of the pound against the dollar on Egyptian imports, most components of the structure of the Egyptian imports ranging from consumer goods, any goods has got involved in manufacturing to meet the requirements of the local market. Therefore, increase the re-export increase the cost of products¹.

Accordingly, the study aimed to achieve its objectives by addressing the following points: (1) Evaluate the worth of Egyptian pound against the dollar, (2) Shed light on the current status of Egyptian imports of dairy industries supplies, (3) Measuring indicators for Egyptian imports of dairy industries supplies and geographical distribution of major exporting countries and (4) Measuring the most important factors affecting imports of dairy industries supplies in Egypt.

MATERIALS AND METHODS

Some statistical models as the general time trend equations, multi-linear and logarithmic regression analysis were used for the descriptive and quantitative economic analysis.

Using statistical analysis by SPSS obtained the most important factors influencing quantities imported for the dairy industry in Egypt, during the period (2008-2015) as independent variables (the official exchange rate of the pound, the consumer price index and the producer price index), the imported quantities of dairy supplies in Egypt in tons as a dependent variable (milk powder, protein concentrates, emulsifiers, gelatin). Using multiple regression models to determine the most important independent factors that may affect the amount of imports of dairy supplies from this form can determine the impact of the Egyptian pound against the dollar on foreign trade, as well as the impact of other variables that are selected and placed in the form^{3,4}:

$$\text{Linear model: } y_i = a + B_1x_{1t-1} + B_2x_{2t-1} + B_3x_{3t-1}$$

$$\text{Logarithmic model: } \ln y_i = a + B_1 \ln x_{1t-1} + B_2 \ln x_{2t-1} + B_3 \ln x_{3t-1}$$

Where:

- y = Indicate the dependent variable (the amount of Egyptian imports of dairy products supplies tones)
- a = Constant indicating the equation expresses the change in axis (the change in value of y if steady all variables)
- B₁ = Magnitude of the impact of the change in the official exchange rate of the Egyptian pound against the dollar in the previous month to the dependent variable

- X_{1t-1} = Indicates the independent variable I and is the official exchange rate of the Egyptian pound against the dollar in the previous month
- $\ln X_{1t-1}$ = Logarithm of the official exchange rate of the Egyptian pound against the dollar in the previous month
- B_2 = How much impact on consumer price index for dairy products on the dependent variable
- X_{2t-1} = Refers to the second independent variable and is a consumer price index
- $\ln X_{2t-1}$ = Log of consumer price index
- B_3 = How much impact the producer price index for dairy on the dependent variable
- X_{3t-1} = Refers to the third independent variable and is the producer price index for the previous month
- $\ln X_{3t-1}$ = Logarithm of the producer price index for the previous month

The data sources of research relied on time series data and statistical bulletins from the Ministry of trade and industry, the Economic Affairs sector of the Ministry of agriculture and land reclamation and the Central public mobilization and statistics services. In addition to some reports and scientific references and publications and research related to research topics.

RESULTS AND DISCUSSION

Evolution of the Egyptian pound against the dollar during the period (2008-2015): Reviewing the evolution of Egyptian pound against the dollar shows a decline of about 5.30 pounds/dollar in January, 2008 to about 7.94 pounds/dollar in December, 2015 down 2.640 pounds/dollar and estimated 49.81%. Estimating the equation of general time trend of yearly evolution of the Egyptian pound against the dollar in Egypt showed that, the Egyptian pound against the dollar has taken a decreasing trend and statistically significant by an annual decrease of about 0.027 pounds/dollar, representing approximately 0.43% of the overall average. The average selection coefficient (R^2) that 91% of the emerging changes in the value of the Egyptian pound against the dollar mainly due to the time factor and that about 9%. Due to other factors not measured in function during the study period as shown in the following equation:

$$\hat{Y}_1 = 5.0115 + 0.027 \hat{X}_1 \quad (31.75)**$$

$$R^2 = 0.91 \quad F = 1008.15**$$

This was confirmed by the drop in the pound against the dollar following the outbreak of the global financial crisis from 5.30 pounds in July, 2008 to 5.63 pounds in April, 2009, due to the decrease in foreign investments in Egypt from an average of 10 billion dollars a year to 6 billion dollars². The repercussions of the global crisis on the Euro-zone (the EU countries) began to appear, which led to a reduction in the volume of foreign investments from the EU to the developing world, including Egypt⁵, until the revolution broke out on January 25, 2011. The dollar exchange rate continued to rise by 5% against the pound during the period from January, 2011 to December, 2012 and then achieved an additional rise of 5% in 2013, leading to the cessation of foreign exchange revenues and stop the influx of capital and the departure of foreign direct investment from the market.

The food industry was one of the sectors that are affected severely of the pound against the dollar, the percentage change in the consumer price index in Egypt at the end increased approximately 11.9% in 2015 from that at the end of 2014, while the same ratio in the meat and dairy prices by 8.3 and 10.7% over the same period^{2,6}. During the period of 2012-2016 the dollar crisis severely affected the pharmaceutical, dairy, food and metal industries in Egypt^{2,7}.

Current status of Egyptian imports of dairy supplies in Egypt (2008-2015): The dairy industry in Egypt depend upon many imported dairy supplies either for lack of an alternative, local or non-local alternative, but the dairy industry in Egypt have many economic and social dimensions.

Economic importance of dairy production in Egypt: By extra polating the data Table 1 and 2, which displays the evolution of the value of agricultural production and livestock and dairy production in Egypt (2008-2015) the following economic indicators.

Agricultural output value: The value of agricultural production represent great economic importance, since it turns out that the average annual value of agricultural production during the study period was about 252.2 billion pounds. Where, the value of agricultural production increased from approximately 185.6 million pounds in 2008 to about 318.3 billion pounds in 2015 agricultural output value was tightened up approximately 21.1 billion pounds, representing about 8.35% of the average period of study and this increase has proven significance at level 0.01.

Table 1: Relative importance of dairy production value for national production and agricultural and livestock and dairy in Egypt (2008-2015). (value millionth pounds)

Years	Agricultural production value	Animal production value	Dairy production value	Dairy to agricultural production (%)	Dairy to animal production (%)
2008	185666	65060	17811	9.59	27.38
2009	189438	69120	18082	9.86	27.03
2010	209354	77382	19954	9.53	25.79
2011	249989	84538	24164	9.67	28.58
2012	269905	92800	26931	9.97	29.02
2013	289900	100800	28975	9.99	28.74
2014	305400	113200	27100	8.87	23.94
2015	318332	119406	24888	7.82	20.84
Average	252248	90288	23288	9.23	25.79

Source: Ministry of agriculture and land reclamation, economic affairs sector, agricultural income, bulletin, setting (2008-2015)

Table 2: General time trend equations for production value of the agricultural, livestock and dairy (2008-2015)

Type	Equations	Average	Change rate (%)	R ⁻²	F
Agricultural production value	$\hat{y}_t = 15742.2 + 21071.74 \hat{x}_t (15.017)**$	252248	8.35	0.96	225.51**
Animal production value	$\hat{y}_t = 53895.14 + 8087.36 \hat{x}_t (325.923)**$	90288	8.95	0.98	615.72**
Dairy production value	$\hat{y}_t = 16820.68 + 1481.65 \hat{x}_t (3.758)**$	23288	6.36	0.65	14.13**

\hat{y}_t : Estimated value of the dependent variable per annum, \hat{x}_t : Factors linked to the time period, years 1, 2, 3,....., 8, **Level of significance (0.01%).

Source: compiled and calculated from Table 1

Table 3: Estimation of the quantities of the most important imported dairy products for some dairy products in Egypt 2015

Ratio	Production type	Production quantity for 2015		Quantity of raw materials used in production (Thousand tons)
		Quantity (Thousand tons)	Values (Thousand pounds)	
Gelatin 0.3%	Ice cream	45.5	1139	0.1365
Emulsifiers 2.5-3.5%	Processed cheese	223.5	2392	6.705
Milk powder 25%	Processed cheese	223.5	2392	55.875
	White cheese	122.3	2056	30.574
Concentrates protein -	All production	-	-	-

Source: 2, 8, 9, 10, 11

Value of animal production: The average annual value of animal production was approximately 90.3 billion pounds and represented 35.5% of the average value of agricultural production. The animal production value rose from about 65.1 billion pounds in 2008 to about 119.4 billion pounds in 2015, taking the value of animal production during the study period an increasing trend year-approximately 8.1 billion pounds represent 8.95% of the average value of animal production has proven to increase morality at level 0.01.

Value of dairy production: The average annual value of dairy production was around 23.3 billion pounds, representing approximately 25.79% of animal production and contributes towards 9.23% of the value of agricultural production, dairy production value rose from about 17.8 million pounds in 2008 to about 28.9 billion pounds in 2013 and dairy production value were taken during the search direction years tightened up around 1.5 billion pounds a year, representing around 6.63% of the average value of dairy production moral proved at level 0.01.

Estimation of used quantities of the most important imported dairy products: The data in Table 3 shows the quantities used of some imported raw materials in year 2015.

Gelatin^{2,8,9}: Ice cream is one of the most important products that enter gelatin in its industry and Egypt imports about 150,000 kg of gelatin worth about 7.977 million pounds by 2015, Egypt produces an estimated 40.5 thousand tons of ice cream used About 121.5 thousand kg of gelatin.

Emulsifying salts^{2,9,10}: Egypt imports about 117 t of salts of emulsification with an estimated value of 2.277 million pounds. Emulsifying salts are used in the manufacture of cooked cheese. Egypt produces about 223.5 thousand tons of processed cheese. It uses about 6.7 thousand tons.

Milk Powder^{2,9,11}: Egypt imports about 3.7 thousand tons of milk powder with an estimated value of 81.075 million pounds. In many products, milk powder was replaced by natural milk. It was used in the manufacture of white cheese

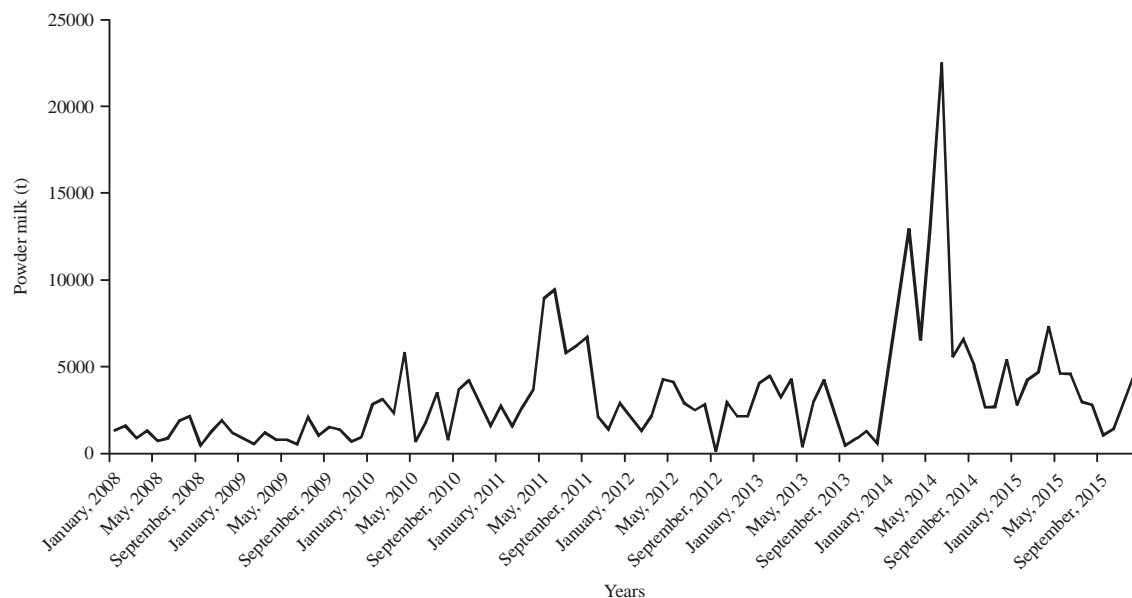


Fig. 1: Evolution of dairy import quantity from powder milk (ton) (2008-2015)

and cooked cheese, representing about 25% each. Egypt produces about 223.5, 122.3 thousand tons of each, respectively and used about 55.874, 30.5 thousand t of milk powder each in production.

Evolution of Egyptian imports quantity and value of the main requirements of the dairy industry (2008-2015):

Dairy production in Egypt based on many production requirements of the local and imported ones, the most important inputs imported from abroad in dairy powder and protein status, some preparations used in food industry, gelatin and emulsifiers (according to the customs tariff of the Harmonized System (HS code), the milk powder under the customs item 0402, the emulsifying materials, the protein concentrates and the food preparations are classified under the customs item 2106 and the gelatin within the customs item 3503).

Evolution of the Egyptian imports of milk powder during the period (2008-2015):

Through the evolution of Egyptian imports of powdered milk quantity notes an increase in the amount of imports during the period from February-May of each year during the study period (except as a result of the political unrest in 2013), Fig. 1. The increased imports of powdered milk dramatically during the period of January-July, 2014 was due to the decline in world prices for dairy powder significantly increased particularly in Europe after the Russian banned to import milk powder from Europe. Where, prices fell to about 5000 dollars baby milk per ton to about 2400 dollars a ton from 2013 until December, 2014¹.

Estimating the general time trend shown in the Table 4, the evolution of imports quantity milk powder is in Egypt showed that the amount of milk powder imported taken an increasing trend with an annual statistical significant increment of about 45.731 t, representing about 1.37% of the overall average of about 3322 t, a value of the coefficient of determination (R^2) to 15% of the emerging changes in the amount of imports was mainly due to the time factor and the remaining were due to other factors not measured in function during the study period.

The general time trend equation indicates that the year of import value in Egyptian pound and dollar, respectively as shown in the Table 4 to increase statistical moral about 728.28 thousand pounds, about \$89.80 and representing about 1.44 and 1.18% of the average value of imports respectively. The value of the coefficient of determination (R^2) to 32 and 25%, respectively, of the emerging changes in imports due to the time factor and the rest was attributable to other factors not measured in function during the study period.

Development of Egyptian imports of protein concentrates:

Figure 2 shows the development of Protein concentrates imports quantity (2008-2015). It was found that the average annual quantity of imports of protein concentrates was about 468.2 t during the study, the average was between the sword reached about 4 t in 6/2009 and their subordinate about 331.4 t in 12/2014, increasing lack of 863.2, reached 464.2 t, respectively on annual average. In reviewing the

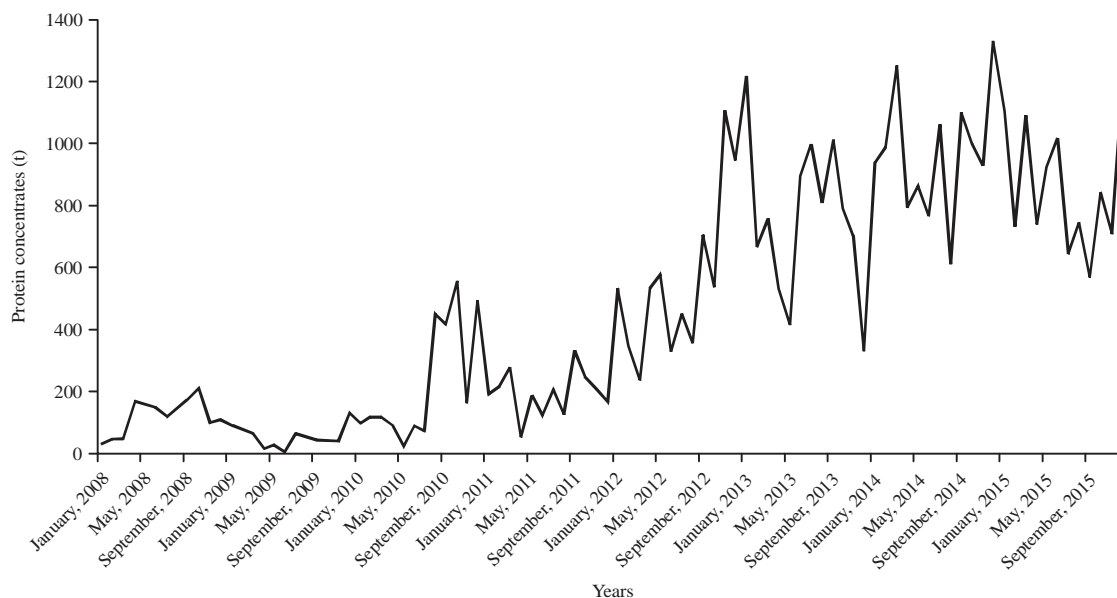


Fig. 2: Evolution of protein concentrates imports quantity in tons (2008-2015)

Table 4: General time trend equations of quantity and value of Egyptian imports from most dairy supplies in Egypt (2008-2015)

Dependent variables	α	β	Average	Annual change rate (%)	T	R ⁻²	F
Powder milk							
Quantity (t)	1104.15	45.741	3322	1.37	4.175	0.15	7.43**
Value (thousand pound)	15138.01	728.281	50460	1.44	6.732	0.32	4.33**
Value (thousand \$)	3236.24	89.799	7623	1.18	5.625	0.25	31.64**
Protein concentrates							
Quantity (t)	93.11	11.573	468	2.47	15.159	0.71	229.81**
Value (thousand pound)	381.63	111.254	5014	2.22	14.344	0.68	205.74**
Value (thousand \$)	77.83	13.838	749	1.85	12.393	0.62	153.30**
Emulsifiers							
Quantity (t)	93.433	0.558	121	0.46	1.953	0.04	3.82*
Value (thousand pound)	1537	2.14	2278	0.08	1.536	0.02	2.36*
Value (thousand \$)	326.66	0.695	360	0.19	0.875	0.01	0.77*
Gelatin							
Quantity (t)	97.46	0.725	131	0.55	1.933	0.04	3.74*
Value (thousand pound)	2174.29	72.651	5698	1.27	8.977	0.46	80.58**
Value (thousand \$)	501.91	7.821	881	0.89	6.157	0.28	37.91**

**Significant at 1%, *5% in significant

Table 5: Outcome indicators of the Egyptian imports of production requirements for dairy products

Production element used in the dairy industry	Growth rate in the value of imports from the world (%)	Growth rate in the value of imports from the world (%)	Egypt's share in world imports (%)	Most important exporters of Egypt			
				States	Import share (%)	Import price	State participation in exports (%)
Milk powder	3	10	1.5	New Zealand	28.7	2210	25
				Germany	16.1	2194	8
				France	12.1	2225	6
Protein and emulsifiers	14	16	0.5	Netherlands	19.3	3921	9
				Thailand	15.9	1965	3
Gelatin gelatinous material	7	3	1.0	Germany	12.2	3127	9
				Brazil	41.3	6633	17
				France	35.0	7258	10
				Germany	11.0	7508	13

Source:¹², compiled and calculated from the international information network Internet

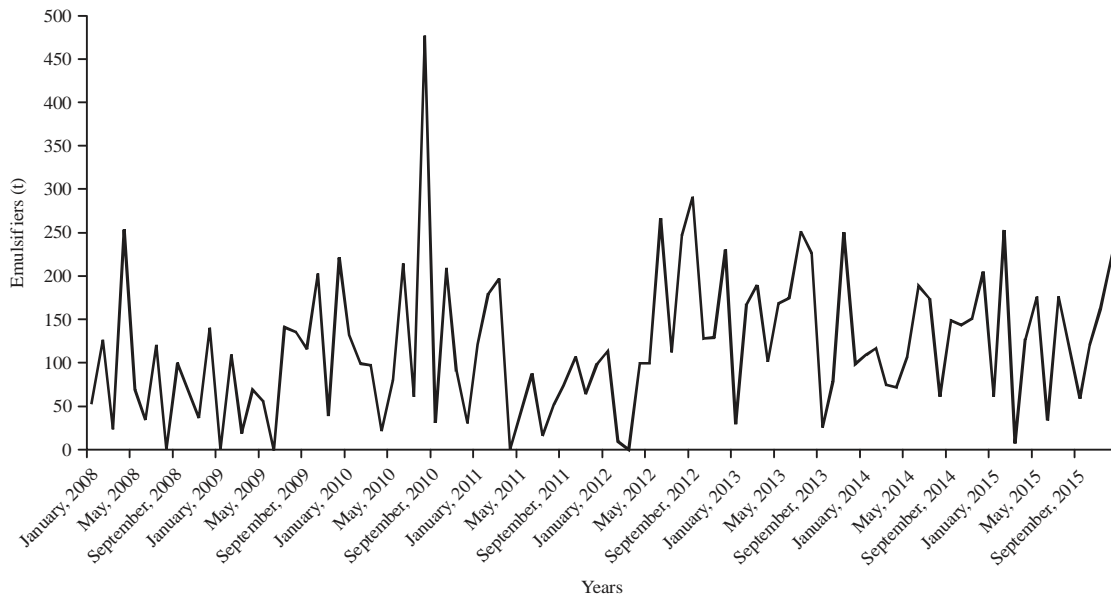


Fig. 3: Evolution of imports emulsifiers in tons (2008-2015)

evolution of protein concentrates imports reflected an increase in imports of protein concentrates from January-December of each year during the study period (except in 2013 as a result of the political unrest), with a significant increase in early 2014 and until the end of the study period. This may be due to the inability of local alternative protein concentrates on meeting the needs of the dairy industry in Egypt. By measuring the general time direction equations that are shown in the Table 4 the evolution of imports quantity protein concentrates in Egypt showed that, the quantity of imports shows an increased significant statistical trend with an annual increment of about 11.57 t, representing about 2.47% of the overall average of about 468.2 t. The value of the coefficient of determination R^2 illustrated that 71% of the emerging changes in the amount of imports was mainly due to the time factor and the remaining were due to other factors not measured in function during the study period. Also, the general time trend equation indicates the import value of protein concentrates in Egyptian pound and dollar, respectively to increase statistical moral about 111.253 thousand pounds, about 13.838 thousand dollars and representing about 2.22 and 1.85% of the average value of imports, respectively. As well as, the value of the coefficient of determination R^2 to 68 and 62%, respectively, of changes in the value of imports was due to the time factor and the rest was attributable to other factors not measured in function during the study period.

Evolution of Egyptian imports of emulsifiers²: Figure 3 illustrates the quantity of imports of emulsifier's materials during development period (2008-2015) that there is a relative stability in quantities imported (except in August, 2013). The estimated annual average quantity of imports of emulsifiers is approximately 121 t during the study, the average is between the sword reached 473 t of bands around 8/2010 and their lower about 1 t 1/2009, to increase and lack of 345.6 reached 120 t, the annual average, respectively.

Estimating the general time trend and shown in the Table 4 the evolution of imports quantity emulsifiers in Egypt showed no increase in the amount of moral Egyptian imports emulsifiers during the study period and equation of general time trend of import value emulsifiers in Egyptian pound and dollar to lack moral value statistically increased during the study period. This lack of statistically moral increase in both quantities and values imported from emulsifiers was due to the Egyptian producer use an alternative product which was the local product as a variant that was due to the high world prices for emulsifiers during that period, with the growth rate in those prices about 28% during the period 2008-2015.

Evolution of Egyptian imports of gelatin²: Figure 4 illustrate the evolution of imports quantity of gelatin during the period (2008-2015), the average annual quantity of imports of gelatin is about 133 t during the study. The average was between the sword reached 569 t of bands around 8/2010, some 4.7 t in their Junior 8/2009, to increase and shortfall 436 and 564.3 t more than the annual average, respectively.

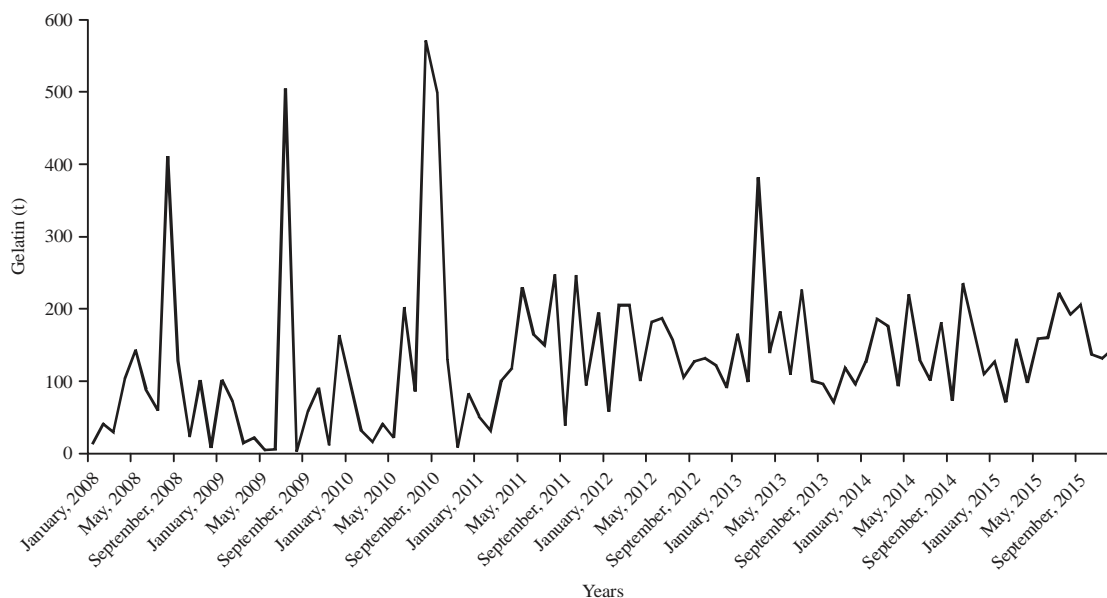


Fig. 4: Amount of imports of gelatin in tons (2008-2015)

The evolution of imports of gelatin indicate that there was a relative stability in the amount of imports with spikes in imports during the third quarter of 2009, 2010 and 2011, due to some constraints for local gelatin industry in Egypt such as the spread of foot-and-mouth disease, which affected the number of the slaughtered animals (which was the main component of the MCD gelatin). In addition, there were some governmental decisions to transfer tanneries (rattan gelatin) to other industrial areas away from the residential blocks, which affecting the quantities produced of gelatin locally and imported alternative manufacturers. Also, results predicted that the specifications of the imported gelatin was best for the dairy industry than the local gelatin, due to low of the production technology in Egypt of the gelatin manufacturing processes compared to other countries, indicating the importance of Egyptian side interest to develop global developments of gelatin industry in this area.

Estimating the general time trend shown in Table 4, the evolution of imports amount to gelatin in Egypt, showed no increase in those moral quantities imported during the study period. As well as, the equation of general time trend of Egyptian imports of gelatin in Egyptian pound and dollar, respectively as shown in the same table to increase statistical moral nearly 72.651,000 pounds, about 7.821 thousand \$ represent approximately 1.27 and 0.89% of the average value of imports, respectively. The value of the coefficient of determination R^2 46 and 28%, respectively, of changes in the value of imports was due

to the time factor and the rest was attributable to other factors not measured in function during the study period.

Indicators of the Egyptian imports of dairy supplies and geographical distribution of major exporting countries¹²:

Egypt depends heavily on European countries to import the production requirements for the dairy industry, where the European Union is the largest exporter of such products worldwide. The results in the Table 5, showed the most important indicators of the Egyptian imports of those items involved in the manufacture of dairy products during the period (2008-2015) which include the following.

- For dairy powder Egypt imports accounted for about 1.5% of total world imports, the rate of growth of the quantities imported by Egypt are about 10% in 2015 compared to 2008. While, import value growth rate of Egypt's imports of powdered milk for the same period was about 3% and may explain that due to low world prices of powdered milk from 2013 until early 2015 and direction of Egyptian importers import larger quantities under the low price. Research results showed that the New Zealand lies in first place for the most important dairy exporting countries powder for the Egyptian market, followed by Germany and France in second and third, while they contributed about 25, 8 and 6%, respectively, of total world exports of powdered milk for all the world

- For protein and emulsifiers materials, Egypt imports about 0.5% of total world imports, the rate of growth of the quantities imported by Egypt about 16% in 2015 compared to 2008, while import value growth rate of Egypt's imports of powdered milk for the same period about 14%. The results of the study indicated that the Netherlands lies in first place, followed by Thailand and Germany in second and third respectively, while they contributed approximately 9, 3 and 9%, respectively
- For gelatin and gels Egypt imports represented about 1% of total world imports, the rate of growth of the quantities imported by Egypt about 3% in 2015 compared to 2008. Search results indicate that the most important exporters of gelatin to the Egyptian market that Brazil ranked first concentrated, followed by France and Germany in second and third, while those states contributed 17, 10 and 13%, respectively, of total world exports of gelatin

A study of the most important factors affecting the Egyptian imports of production requirements associated with dairy products: Pound is considered and the availability of foreign currency are the most important determinants for the import operation in Egypt, especially imports of production inputs to complete various manufacturing processes in general¹³ and production requirements for dairy manufacturing in particular, through the model used to measure the impact of exchange rate on Egyptian imports of key inputs used in the manufacture of dairy products.

Regression analysis method was used for linear and Log it Models progress to determine the most important independent factors, which may affect the amount of imports of dairy supplies. This model could see devaluations of the Egyptian pound against the dollar on the import of most dairy supplies, as well as the impact of other variables that were

selected. Where, the study found that the best sports pictures are appropriate and consistent with economic and statistical logic as shown in Table 6.

Estimation results of the statistical model used to measure the impact of exchange rate on Egyptian imports of key inputs used in the manufacture of dairy products (2008-2015) indicate that^{6, 14}

First: The Eq.1 in the Table 6 refers to the existence of a direct correlation between the producer price index and the amount of Egyptian imports of milk powder, the producer price index by 1% more Egyptian imports of milk powder by about 81.99 t, while indicating an inverse relationship between the total quantity of imports of milk powder, the official rate of the dollar. Also, found an inverse relationship between the quantity of imports and consumer price index, indicating producers bear the burdens of higher production costs than the consumer in order to maintain higher prices to ensure a minimum level of consumption ensures continuation of production processes and moral doesn't prove the rest of the factors. As indicated in Eq. 2 in the double logarithmic in Table 6 that the pound against the dollar and the producer price index of the most important factors affecting the amount of Egyptian imports of milk powder. So, that the exchange rate of the pound single unit leads to lower Egyptian imports by 269 t, model has proven to be moral.

Second: The Eq.3 in the Table 6 the existence of a direct correlation between the price of the dollar amount of the Egyptian imports of protein concentrates. As it turns out having a direct correlation between the producer price index and the amount of Egyptian imports of protein concentrates, the greater the number of producer prices by 1% more Egyptian imports of milk powder by about 7.981 t. While, indicating an inverse relationship between the quantity of imports and consumer price index. While, explaining the

Table 6: Statistical model used to estimate results of measuring the impact of exchange rate on Egyptian imports of key inputs used in the manufacture of dairy products (2008-2015)

Variable dependent	Number	Model	Equation	R ⁻²	F	Sig.
Milk powder	Eq. 1	Linear	$Y = -5069.97 - 542.05x_{1t-1} - 97.114x_{2t-1} + 81.99x_{3t-1}$ (-0.643) (-1.030) (2.076)	0.14	5.075	**
	Eq. 2	Logarithm	$\ln y = -4.523 + 0.269 \ln X_1 - 0.242 \ln X_2 + 2.442 \ln X_3$ (0.184) (-0.779) (1.529)	0.15	5.793	**
Protein concentrate	Eq. 3	Linear	$Y = -1920.115 + 190.51x_{1t-1} - 8.826x_{2t-1} + 7.981x_{3t-1}$ (3.335) (-1.382) (2.979)	0.72	79.20	**
	Eq. 4	Logarithm	$\ln y = -28.756 + 1.520 \ln X_1 - 0.489 \ln X_2 + 6.472 \ln X_3$ (1.263) (-1.915) (4.925)	0.69	71.386	**
Emulsifiers	Eq. 5	Linear	$Y = 72.768 + 13.399x_{1t-1} - 2.530x_{2t-1} - 0.070x_{3t-1}$ (0.617) (-1.043) (-0.068)	0.06	2.068	--
	Eq. 6	Logarithm	$\ln y = -0.198 + 0.173 \ln X_1 - 0.348 \ln X_2 - 1.034 \ln X_3$ (0.112) (-1.067) (0.617)	0.05	1.728	--
Gelatin	Eq. 7	Linear	$Y = -32.164 - 26.336x_{1t-1} - 1.061x_{2t-1} + 2.192x_{3t-1}$ (-0.923) (-0.333) (1.639)	0.05	1.496	--
	Eq. 8	Logarithm	$\ln y = -22.084 - 2.378 \ln X_1 - 0.302 \ln X_2 + 2.442 \ln X_3$ (-1.538) (-0.922) (3.720)	0.25	10.532	**

\hat{y}_t : Estimated value of the dependent variable per annum. **Level of significance (0.01%), non-moral, Source: Compiled and calculated data of the central agency for public mobilization and statistics, foreign trade database, the central agency for public mobilization and statistics, published price indices for producers and consumers

Table 7: Matrix of most important factors affecting the import requirements of the dairy industry and its products (2008-2015)

The most important factors affecting the importation requirements of the dairy industry and its products			
Production requirements	Dollars price	Consumer index	Product index
Milk powder	Ineffective	Ineffective	Effective
protein	Effective by 1.9 t/month	Ineffective	Effective
Emulsifiers	Effective by 13.3 t/month	Ineffective	Ineffective
Gelatin	Ineffective	Ineffective	Effective

Eq. 4 dual logarithmic image in Table 6 to pound against the dollar and the producer price index of the most important factors affecting the amount of Egyptian imports of protein concentrates, moral proved form and the coefficient of determination (R^{-2}) toward 0.69 indicating that 69% due to change in variables (x_1), (x_3) and did not demonstrate moral (x_2).

Third: The Eq. 5 in the Table 6 indicates the existence of a direct correlation between the price of the dollar and the amount of Egyptian imports of emulsifiers, that the lower the value of the pound against the dollar by one pound led to decrease the amount of imports from emulsifiers rose 13.39 t. As it turns out having an inverse relationship between the producer price index and consumer price index and the amount of Egyptian imports of emulsifiers, didn't prove generally form moral and explains that the trend toward local alternative producers emulsifiers and stresses that the lack of moral time trend year for quantities imported for high world prices by about 28% during the period (2008-2015) as seen in Table 4. The Eq. 3 as logarithmic Table 6 shows that the pound against the dollar is the most important factors affecting the amount of Egyptian imports of emulsifiers as one unit exchange rate leads to lower Egyptian imports by about 173 t, not proven significance form in General.

Fourth: The Eq. 7 in Table 6 shows the existence of a direct correlation between the producer price index and the amount of Egyptian imports of gelatin, as it turns out having a direct correlation between the producer price index and the official rate of the dollar and the amount of Egyptian imports of gelatin. Therefore, did not demonstrate moral form generally agree that result with no increase in the time direction General of moral quantities imported from gelatin, indicating the direction of Egyptian products to use local rather than imported alternative due to the high world prices for gelatin, confirms on a moral import value increased to gelatin without quantities imported during the study period as shown in Table 4. The Eq. 8 in the double logarithmic, Table 6 that the producer price index is one of the most important factors affecting the amount of Egyptian imports of gelatin, as moral

set model and the selection coefficient (R^{-2}) 0.25 indicating that 25% of the changes in the amount of imports of gelatin due to change in variables (x_3) and the rest did not prove psychological factors.

Finally the Table 7 matrix Layne on importing dairy products industry supplies during the study, the table shows the effective impact of the low exchange rate for the Egyptian pound on import each of protein concentrates and emulsifiers due to increased reliance on providing such productive inputs from abroad for the poor quality of local alternative or its rarity sometimes. Results show that the Egyptian pound against the dollar by 1% of Egyptian imports quantity affected protein concentrates emulsifiers 1.9 and 13.3 t/month on the arrangement.

The impact of the Egyptian pound against the dollar on dairy powder is not large, with the Egyptian pound against the dollar went down world prices for dairy powder, thereby reducing the impact of the decline in the pound against the dollar on imported quantities of milk powder during the study period. As regards the quantities imported from gelatin shows a lack of significant impact for the dollar-pound quantities imported, this may be attributed to the Egyptian local alternative plant asylum despite lower quality compared to the importer, with a view to reducing the production costs of the final product of the dairy industry.

This was evidenced by the study Helmy¹³, which shows the chronic and continuous deficit in the Egyptian trade balance, where Egyptian exports often represent 50% or less of the volume of Egyptian imports. The deficit in the Egyptian trade balance in 2015 is about 39 billion pounds, Exports and the increase in the import bill for different reasons, most notably the change in the value of the Egyptian pound against the dollar. This was confirmed by study El Agroudy *et al.*¹⁵, which revealed the reasons and effects of successive increases in the dollar exchange rate. One of its most important reasons is the desire to eliminate the black market of currency by narrowing the gap between the official rate and the rate of the parallel market and trying to unify the two rates. Some of the most important negative effects of raising dollar exchange rate are the rise in the prices, delaying the implementation of projects, the rise in the rate of inflation, severe losses to

tourism companies, lack of medicines and the rise in the prices of building and construction materials, especially those that are imported. Moreover, some of the reasons for raising of the dollar rate are the government's attention to the economic conference in March, the Central Bank's last decision to reduce the interest rate on bank deposits to 1%, repaying some of the financial obligations, owed by the state.

In 2016¹, the negative impact of the devaluation of the pound on the foreign trade sector has positive effects on exports and other negative effects on the import bill. The increase in the import bill is one of the main negative effects of the depreciation of the pound in terms of the high cost of importing foreign goods.

In light of all this, it was necessary for the government to take some measures that help improve the investment climate and control the exchange market. This was done by allowing the Egyptian Central Bank to reduce the value of the Egyptian pound against the dollar in order to reduce the difference between the official price and the parallel price in particular stages during. In 2015 and this led to a violent earthquake in the parallel market led to a decrease in the difference between the official and parallel prices and the occurrence of many repercussions in the Egyptian economy, the most important impact of the devaluation of the pound against the dollar on prices and living standards.

CONCLUSION

The quality of products of gelatin is increased by introducing modern technologies through specialized programs. As well as, focus on localization for manufactories specially the protein concentrates used in the food industry. Above all, encourage factories to work for local products imports whenever possible, especially in relation to rely on local gelatin instead of importer. The government should take some measures to improve the investment climate and control the decline in the exchange rate.

SIGNIFICANCE STATEMENTS

This study reveals the seriousness of the devaluation of the pound against the dollar on Egyptian imports and the extent to which the dairy industry in Egypt was affected by the change in the exchange rate. This helps in the development of the productive activity of the food industry in general and the dairy industry in particular. The study will also help the researcher to uncover the most important factors that affect the imports of the dairy supplies in Egypt.

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