
An Analytical Study of Spending on Red Meat in the Urban and Rural Areas of Fayoum Governorate

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ABSTRACT

Red meat conspicuously represents one of the most important sources of animal protein for the Egyptian consumer. Besides, the relative importance of calories from animal protein to the Egyptian citizen is about 4.8%, while its counterpart in some developed countries is about 31%. The consumer suffers from unbalance in terms of health. This is due to his relatively more dependence on vegetable protein. The research problem lies in increasing the rates of red meat consumption year after year as a result of the forced increase in the population. This is in addition to the small production of red meat, which led to widening the gap between production and consumption. The research aimed at studying the development of production and consumption, the average per capita share, the percentage of self-sufficiency and the size of the food gap of red meat during the period (2000-2018) as well as studying the agreement function of the study sample at different income levels. The study relied on the secondary data collected from the Central Agency for Public Mobilization and Statistics and the Ministry of Agriculture. Besides, it depends mainly on the primary data collected through the questionnaire form for a random sample consisting of 312 families from Fayoum Governorate distributed as follows 147 families from the urban in Fayoum Center and 165 families from the rural in Fayoum Center in 2019. The study showed an increase in both production and consumption. Besides, the average share per capita of red meat had a statistically significant increase estimated at 14.6, 36.8 thousand tons, 0.151 kg / year respectively during the study period (2000-2001), while the rate of self-sufficiency achieved an annual statistically significant decrease of about 1.1%. Moreover, a random sample consisting of 312 families from Fayoum Governorate distributed as follows 147 families from the urban in Fayoum Center and 165 families from the rural in Fayoum Center in 2019. The sample was divided into three categories according to the family income, the first category is less than (2000 pounds), the second category (2000-4000 pounds), third category (more than 4000 pounds). The Stage Regression is used in the bi-logarithmic form to determine the most important factors affecting spending on red meat in the study sample in the urban and rural of different income categories at Fayoum. The results indicated that there is a direct relationship between the families' spending on red meat, the average monthly family income, the number of family members, and an inverse relationship with the price of meat in the countryside and urban areas. Finally, red meat is a luxury item especially in low-income families.

Keywords: red meat production, consumption of red meat, consumption spending.

Introduction

Red meat conspicuously represents one of the most important sources of animal protein for the Egyptian consumer. Besides, the relative importance of calories from animal protein to the Egyptian citizen is about 4.8%, while its counterpart in some developed countries is about 31%. Moreover, the relative importance of calories derived from grains to the Egyptian citizen is about 60.5%, while its counterpart in developed countries is about 19.7%. Although the total share of the Egyptian citizen's calories is close to its counterpart in developed countries, he suffers from unbalance in terms of health due to his relatively more dependence on vegetable protein.

Problem of the Study

The research problem lies in increasing the rates of red meat consumption year after year as a result of the forced increase in the population. This is in addition to the small production of red meat,

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which led to widening the gap between production and consumption and thus a decrease in the average per capita share of them from the global rates recommended by international organizations. Therefore, it requires the necessity of identifying the most important determinants of red meat production and its demand

Objective of the Study

Based on the problem of the study, its objective was determined in identifying the reasons for the low average per capita share of red meat through:

Studying the development of production and consumption, the average per capita share, the percentage of self-sufficiency and the size of the food gap of red meat during the period (2000-2018) as well as studying the agreement function of the study sample at different income levels.

Methodology of the Study and Data Sources

The study used the descriptive analysis approach in describing the problem in addition to the quantitative analysis using some different scales such as the general direction that was used in studying the development of some productive and consumer indicators of the commodity under study. This is in addition to the multiple regressions used in estimating each of the spending functions of the study sample.

Moreover, the study relied on the secondary data collected from the Central Agency for Public Mobilization and Statistics and the Ministry of Agriculture. Besides, it depends mainly on the primary data collected through the questionnaire form for a random sample consisting of 312 families from Fayoum Governorate distributed as follows 147 families from the urban in Fayoum Center and 165 families from the rural in Fayoum Center in 2019.

Evolution of Some of the Production and Consumption Indicators of Red Meat in the Arab Republic of Egypt

Red meat is one of the most important sources of animal protein. Consequently, it receives the state attention to provide it, whether by increasing the efficiency and productivity of the resources used in its production or encouraging investments in the field of its production requirements to fill production deficiencies in meeting local consumption requirements and the continuous decline in the average per capita share of them from the global standard rates. It reached about 14.9 kg / year as an average for the study period.

First: Amount of Production and Consumption, Average per Capita and Self-sufficiency of Red Meat in Egypt

Through studying the amount of red meat production at the national level during the period (2000-2018), it was shown that it ranged between two levels, a minimum of about 672 thousand tons in 2000, and a maximum of about 1030 thousand tons in 2018 with an increase of about 53.3%. This is in addition to the estimate of the general time direction equation for production during the study period. A statistically significant annual increase estimated at 14.6 thousand tons, representing about 1.62% of the average amount of production, estimated at 898 thousand tons, as shown in Table (1).

As for the consumption of red meat at the national level, it ranged between a minimum of about 782 thousand tons in 2000, and a maximum of about 1506 thousand tons in 2018, with an increase representing about 92.6%, and with an estimate of the general time direction of red meat consumption during the study period (2000- 2018). The statistically significant annual increase is estimated at 36.8 thousand tons, representing about 3.1% of the average consumption, estimated at 1175 thousand tons, as shown in Table (1).

The average per capita share of red meat at the national level ranged between a minimum of about 12.1 kg / year in 2001, and a maximum of about 19.05 kg / year in 2015. This is in addition to an increase representing about 57.4%, and an estimate of the general time direction equation for the average per capita of red meat during the study period (2000-2018). The annual statistically significant increase estimated at 0.151 kg / year, represents about 1.01% of the average study period, estimated at 14.9 kg / year, as shown in Table (1).

Moreover, the percentage of self-sufficiency in red meat ranged between a minimum of about 57.6% in 2015, and a maximum of about 88.8% in 2009. This is in addition to an increase of about

51% over the minimum, and by estimating the general time direction equation for self-sufficiency of red meat during the study period (2000-2018), the significant annual deficiency is statistically significant, estimated at 1.1%, representing about 1.5% of the average study period, estimated at 77.9%, as shown in Table (1).

Table 1: Equations of the General Time Direction of the Amount of Production, Consumption, and Self-sufficiency of Red Meat during the Period (2000-2018)

Indices	Equation	R ²	Average	Rate of Change
Production (Thousand Tons)	$Y^{\wedge} = 752 + 14.6 X_i$ (4.6)**	0.56	898	1.62
Consumption (Thousand Tons)	$Y^{\wedge} = 807 + 36.8 X_i$ (7.6)**	0.77	1175	3.1
Individual's Share (kg / year)	$Y^{\wedge} = 13.4 + 0.151 X_i$ (2.4)*	0.26	149	1.01
Self-sufficiency %	$Y^{\wedge} = 89.3 - 1.1 X_i$ (4.3-)**	0.52	77.9	1.5

Where Y^{\wedge} indicates the estimated value of the dependent variable,
 X_i denotes the time element as an independent variable where i (1, 2, 3, 4 ... 19)
 ** Significant at level of 1%

Source: Ministry of Agriculture - Central Administration for Agricultural Economics - Food Balance Bulletin - various Editions.

Second: Study Sample, Family Income, Individual Consumption, and Spending on Red Meat

Through studying the sample of the study that was randomly selected from the urban and rural areas of Fayoum Center in Fayoum Governorate, because Fayoum Center is one of the largest centers in the population, 312 families were divided into 147 families as urban, representing about 47.1%, and 165 families representing 52.9% as rural. Moreover, the monthly income of the family was chosen. Consequently, the first category was (less than 2000 pounds), the second category was (2000-4000 pounds), and the third one was (more than 4000 pounds). Besides, the number of urban families was 30, 80, 37 for the 3 categories, respectively, while the number of families in the countryside was 35, 85, and 45 families for the 3 categories, respectively. The average monthly income of the family for the three categories in urban areas is about 1253, 2670, 5540 pounds for the three categories, while the average monthly income of a rural family is about 1137, 2450, 5216 pounds for the three groups, respectively. Additionally, the average number of individuals in families for the three urban groups is about 5, 5, 4 individuals, while the average number of individuals in the family in the countryside is about seven, 6, and 5 individuals, respectively.

Table (2) shows that the monthly per capita consumption of red meat in the three sample categories is about 0.750, 1.083 and 1,500 kg / month, respectively, while in the countryside it is about 0.667, 1.00, and 1,250 kg / month, respectively. The increase in urban over rural is represented by about 11.1 %, 7.7%, and 16.7% for the 3 categories, respectively.

Table 2: Selected Sample in the Urban and Rural Areas of Fayoum, Per Capita Consumption, Consumer Prices, Household Income, and Monthly Spending on Red Meat, Poultry, and Fish

Statement	First category		Second category		Third category	
	Urban	Rural	Urban	Rural	Urban	Rural
Number of Families	30	35	80	85	37	45
Number of Family Members	5	7	5	6	4	5
Monthly Family Income	1853	1537	3670	3150	6550	5218
Individual's Share of Red Meat kg / Month	0.750	0.667	1.083	1.000	1.500	1.250
Red Meat Price kg / Pound	100	80	115	110	125	110
Poultry Price kg / Pounds	33	26	35	30	40	35
Fish Price kg / Pounds	30	25	40	35	50	40
Spending on Red Meat per Pound	375.0	353.3	663.0	600.0	750.0	687.5

Source: Collected and Calculated from the Data of the Study Sample in Fayoum Governorate in 2019

The price of the kilogram of meat in the three urban categories was about 100,115,125 pounds and reached about 80, 110, and 110 pounds in the countryside of the sample for the three groups, respectively. It became obviously clear from the study that the first category of imported meat was preferred because their prices match with their income.

The Monthly spending of the family on red meat in the three sample groups, which amounts to about 375, 663, 750 pounds / month, while in the countryside it is about 353.3, 600, and 687.5 pounds / month, respectively. The increase in urban over rural is represented by 5.8%, 9.5%, 8.3%, respectively as shown in Table (2).

Third: Factors Affecting Consumption Spending on Red Meat of the Study Sample

This part of the research comprises a study of the factors affecting the consumption of red meat. Besides, income is one of the most important factors along with the price of the commodity and the prices of alternative goods. These factors differ from one person to another and from one society to another.

Factors Affecting Consumer Spending in the Urban and Rural Areas of the Sample

Through studying the relationship between consumers spending on meat (Y), as a dependent factor, and the independent and influencing factors, namely; the number of family members (X1), the price of red meat (X2), poultry price (X3), fish price (X4), and the monthly income of the family head (X5). The Stage Regression is used in the bi-logarithmic form to determine the most important factors affecting spending on red meat in the study sample in the urban and rural of different income categories at Fayoum.

1- Consumer Spending on Red Meat in the First Urban and Rural Category (Less than 2000 Pounds):

Estimates of the function shown in Table (3) indicated the positive and statistically significant relationship between the monthly spending on red meat in Fayoum urban region, first category of the study sample and the number of family members (X1), the price of a kilogram of fish (X4), the monthly income in pounds (X5). Besides, the spending flexibility was estimated at about 1.1, 0.291, and 0.85, respectively. It means that spending on red meat increases with an increase in the number of family members, the price of a kilogram of fish, and monthly income. Moreover, it was observed that the relationship between spending on red meat and income indicates that red meat for the first category is a luxury good because of the family's low monthly income. The value of determining coefficient is approximately 0.87 shows that 87% of the changes are in consumer spending on red meat due to the described independent factors. Therefore, the statistical significance of the estimated pattern was valid at a significant level of 0.01 as the value of calculated (F) was about 77.6.

Table 3: Stage Regression Equations for the Most Important Factors Affecting Spending on Red Meat in the Three Income Categories in the Urban and Rural Areas of Fayoum Governorate of the Study Sample in 2019

Meat Kind	Statement	Mathematical Equation	R ²	F
First Category	Urban	$LN Y = 2.2 + 1.1 LN X_1 + 0.291 LN X_4 + 0.85 LN X_5$ (15.2)** (2.2)** (5.3)**	0.87	77.6
	Rural	$LN Y = 1.4 + 0.96 LN X_1 + 0.112 LN X_2 + 0.84 LN X_5$ (17)** (2.1)* (6.7)**	0.90	179
Second Category	Urban	$LN Y = 3.9 + 0.981 LN X_1 - 0.181 LN X_2 + 0.525 LN X_5$ (23.5)** (2.7)** (3.3)**	0.86	226
	Rural	$LN Y = 5.8 + 0.962 LN X_1 + 0.384 LN X_2 + 0.161 LN X_5$ (31)** (3.7)** (2.5)**	0.87	369
Third Category	Urban	$LN Y = 2.8 + 1.05 LN X_1 + 0.243 LN X_5$ (136)** (2.4)**	0.89	97
	Rural	$LN Y = 6.8 + 0.859 LN X_1 - 0.33 LN X_2$ (9.5)** (2.4)**	0.81	121

Source: Collected and Calculated from the Data of the Study Sample in Fayoum Governorate in 2019.

(**) Significant at level of significance 0.01

(*) Significant at level of significance 0.05.

The value in parentheses indicates the value of calculated (T).

As for the rural of the first category in the study sample (less than 2000 pounds), the estimates of the function shown in table (3) indicate a direct and statistically significant relationship between monthly spending on red meat in the countryside of the first category in the study sample in Fayoum and the number of family members (X1). This is in addition to the price per kilogram of Poultry (X3), and monthly income (X5). The spending flexibility was estimated at 0.96, 0.112, and 0.84, respectively, which means that spending on red meat increases with the increase in the number of family members, the price of a kilogram of poultry, and monthly income. It was also noted that the relationship is positive between spending on red meat and the income. Consequently, it indicates that red meat for the first category in Fayoum countryside is considered a luxury item, and the value of the determining coefficient of about 0.90 indicates that 90% of the changes in consumer spending on red meat are due to the independent factors shown in the equation. This has proven the statistical significance of the estimated model at the level of significance 0.01 where the value of calculated (F) was about 179.

2- Consumer Spending on Red Meat in the Second Urban and Rural Category (2000- 4000 pounds):

Estimates of the function shown in Table (3) indicate the positive and statistically significant relationship between monthly spending on red meat in Fayoum urban in the second category of the study sample and the number of family members (X1). This is in addition to monthly income in pounds (X5), where spending flexibility was estimated at about 0.981, and 0.252 respectively. It means that spending on red meat increases with the increase in the number of family members and monthly income. Besides, it was observed that the positive relationship between spending on red meat and income indicates that red meat for the second category is a luxury good due to the low monthly income of the family, and the reverse relationship between spending on red meat and the price of a kilogram of red meat (X2). It also means that the lower the price of red meat, the higher the spending on it, and the value of the determination factor of about 0.86 indicates that 86% of the changes in consumer spending on red meat are due to the shown independent factors. The statistical significance of the estimated model was proven at the level of significance 0.01, where the calculated value of (F) reached about 226.

As for the rural of the second category in the study sample (2000-4000 pounds), the estimates of the function shown in table (3) indicate the positive and statistically significant relationship between the monthly spending on red meat in the rural category and both the number of family members (X1) and the price of poultry (X3). Additionally, spending flexibility was estimated by about 0.962 and 0.161, respectively. It means that spending on red meat increases with the increase in the number of family members, and the price of poultry. The inverse relationship between spending on red meat and the price of a kilogram of red meat (X2) was also shown, which means that the lower the price of red meat, the higher spending on red meat. The value of determining coefficient is approximately 0.87 indicates that 87% of the changes in consumer spending on red meat are due to the shown independent factors. This has proven the statistical significance of the estimated model at the level of significance 0.01 where the calculated value of (F) reached about 369.

3- Consumer Spending on Red Meat in the Third Urban and Rural Category (4000 pounds or more):

Estimates of the function shown in Table indicate the positive and statistically significant relationship between the monthly spending on red meat in the Fayoum urban for the third category in the study sample and the number of family members (X1). This is in addition to the monthly income in pounds (X5), where the spending flexibility was estimated at about 1.05, and 0.243, respectively. It means that spending on red meat increases with the increase in the number of family members and monthly income. Besides, it was observed that the positive relationship between spending on red meat and income indicates that red meat for the third category is a luxury item due to the decrease in the monthly income of the family with the increase in the number of individuals. The value of determining coefficient is approximately 0.89 that 89% of the changes in consumer spending on red meat due to the described independent factors. Therefore, the statistical significance of the estimated pattern was valid at a significant level of 0.01 as the value of calculated (F) was about 97.

As for the rural of the third category in the study sample (4000 pounds or more), the estimates of the equation shown in table (3) indicate the positive and statistically significant relationship between the monthly spending on red meat in the third category in the study sample in Fayoum and number of family members (X1). Additionally, spending flexibility was estimated by about 0.859. It means that spending on red meat increases with the increase in the number of family members. The inverse relationship between spending on red meat and the price of a kilogram of red meat (X2) was also shown. The spending flexibility was estimated by about 0.33, which means that with a decrease in price, spending on meat increases. The value of determining coefficient is approximately 0.81 indicates that 81% of the changes in consumer spending on red meat are due to the shown independent factors. This has proven the statistical significance of the estimated model at the level of significance 0.01 where the calculated value of (F) reached about 121.

Recommendations

- 1- The study recommends that it is necessary to expand the production of red meat to ensure that it is available at affordable prices suitable for low-income consumers, by encouraging the raising, production and fattening of calves, working to improve high-yield calves genetically, to ensure increased red meat production.
- 2- The necessity of working to encourage calves breeders and provide them with feed at reasonable prices, which leads to increased production of red meat.

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