Measure the Impact of some Variables on The Level of Productive Capacities of the Fattening Chicken Farms in Qaliubiya Governorate, Egypt

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Abstract: The aim of this study is to measure the impact of some variables on the level of capacities in productive of fattening chicken farms in Qaliubiya Governorate., also study the most important problems facing the producers of broilers in Qaliubiya governorate and some proposed solutions for it. The study relied on field data of the stratified random sample of chicken broiler farms in the private sector of Qaliubiya governorate in 2009. In addition to the secondary data which published in reports and official publications relevant to the subject. Furthermore, the study relied on the methods of descriptive and quantitative, analysis where multiple regressions in double logarithmic scale was form used form to estimate the production functions and costs for the different production capacities and the total sample. The results of the study revealed that, the average net return of the session to produce a ton of live chicken broiler was about 1029.3, 1124.7, 1182.0, and 1081.5 pounds for the first, second and third yield capacities and the total sample of the study, respectively. This indicates, that the production of the third capacity is the most efficient capacity studied , in terms of its efficient use of production inputs and achieve the highest net return. As explained in the results of the overall estimating elasticity's of productivity, the farm capacity of the third capacities work in the second phase of the productivity function. The productive flexibility reached to 0.894, reflecting the declining of the relationship returns to scale. While, the working farms of the first and second capacities followed the first phase of the productivity function. Where, the total flexibility of productivity for each of them is 1.249 and 1.178, respectively and thus reflects an increasing return to scale. The factor of elasticity for the total productivity of farms in the study sample has been estimated at 1.102, this reflects the increasing relationship of returns to scale. Moreover, the study shows that the optimal size to minimize costs at about 7.8, 16.5, 31.6, 19.5 tons of productivity capacity of first (> 5000 chick), second (5000-10000 chick), third (<10 000 chick) and the total study sample, respectively, and that the size of maximizing profit amounted to about 10.3, 19.7, 35.5, 22.7 tons for each of the capacities yield the first, second, third and the total sample of the study, respectively. Nevertheless, the results indicated that the total elasticity of cost function for capacities yield of the first, second, third and the total sample of the study, amounting to 0.972, 0.917, 0.865, 0.879 for each of the three capacities and the total sample, respectively. This indicated that the farm capacities of the three and the total sample of study working in the stage of non-economic for production. The study illustrated the most important problems facing the producers of broilers in Qaliubiya governorate, marked by the obstacles of yield such a as the steady rise in all prices of production inputs the lack of chicks with high conversion efficiency, the lack of trained technical persons, and the spread of diseases and epidemics. As well as obstacles of financing such as: the reduced of cash and self-financing difficulty in obtaining bank loans. There are some marketing obstacles such as: the magnitude of fluctuations in prices, the control of brokers and intermediaries in the marketing process, and the decline of the massacres and refrigerators. The study recommended that there is a need to provide good chicks with strains of high yield, and the provision of production inputs with providing support for farmers' especially small farms, and interest of Stock Exchange of poultry so that it is controlling the prices and not the middlemen and traders. While, working to encourage the establishment of projects to complement the projects fattening poultry, such as the establishment of more feed mills and slaughterhouses by which to accommodate production and availability during the periods of the year.

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1. Introduction:

The problem of food supply is considered as one of the most important problems facing economic policy makers of agricultural and food in Egypt. The agricultural sector is one of the most important sectors, consisting of the Egyptian economy, this sector in both plant and animal a principal sector in the employ of human resources and provides raw materials for the needs of other economic sectors. Livestock production plays an important role in achieving development and self-sufficiency in animal products, the main source of

providing protein needed for human health. As well as the livestock sector is one of the main productive sectors of agricultural, as the income generated from this sector is about 65.06 Milliard pounds, representing about 35.04 % of the total value of agricultural income, amounting to about 185.67 Million pounds in 2008. Also the production of the poultry sector is the most important sectors within the livestock production, where the revenue earned by this sector is about 14.8 Million LE represent about 22.7 % of the value of income generated from the livestock sector, and about 7.97 % of the total agricultural output value during the same year.

The poultry industry is a promising industries in Egypt, which enjoyed the great support from the government since its establishment. The State has issued several laws and supporting resolutions to this industry, encouraging investment, with an estimated total investment in the poultry sector in Egypt is about 16.8 Million pounds. In addition to Working Capital, which amount to about 5 Million pounds annually and accommodate industry workshops about 1.01 million workers in 2008. [2]

Qaliubiya Governorate is considered one of the main governorates in the production of poultry in Egypt, where it is ranked as the fourth in the Republic, after Sharqia, Gharbia and Behaira governorates, respectively. The number of poultry farms in Qaliubiya are 1713 farms about 10.08 % of the total number of poultry farms in the Republic in 2008, with a total production capacity of approximately 62.46 million chickens, and the actual production capacity of approximately 35.961 million chickens represent about 10.5 % of the total actual production of chicken on the level of the Republic during the same year. [2]

Research problem:

The fattening poultry production system is a closed, one, itcan be controlled in production factors and circumstances which require the nature of production in is industry. In addition, environmental conditions that is characterized by Qaliubiya governorate climate suitable and appropriate for the production of poultry for long periods of the year.

The research problem in the lack of clarity in the level of production efficiency in poultry fattening farms of various production-capacities, producers of chicken broiler farms of Qaliubiya governorate in private sector.

Aim of the study:

The study aim is mainly to examine and identify the most important factors affecting the production of broilers in Qaliubiya, governorate furthermore, estimate the economic efficiency for the capacity of various productions and the total sample of field study of broilers farms in addition to identify the most important problems facing the producers of broilers in the governorate and provide some proposed solutions for these problems.

2. Research Method and Data Sources:

The study used descriptive statistical and analytical methods to conclude and discussed results according to the logic of economic, which was in the multiple regression method in the double logarithmic phase to estimate production functions at the level of various capacities of production and the total study sample of poultry farms of Qaliubiya governorate in 2010. As well as, the use of net revenue from production cycle for each ton of product of broilers as economic efficiency criteria to compare between the different productive capacities.

The study has been adopted mainly on the data field sample collected from a stratified random sample of farms producing broilers in the private sectors of Benha, and Toukh as the most important province in Qaliubiya governorate for production of broilers, with quantities amounted to about 13.8 and 11.5 tons, representing about 23.8 and 19.9 % respectively of the total actual production of the private sector in the Governorate, which reached 57.9 thousand tons in 2009.

The selected sample size of 112 farms represent 11.2 % of the total number of the private working farms representing (998 farms), have been divided into three different production capacities on the basis of actual production and the number of operating wards as follows:

- 41 farms represents the first production capacity (less than 5000 chick) was operated with a total number of sessions at (205) production cycle, the rate of (5) sessions of productivity in the year.
- 36 farms represents the second production capacity (from 5000-10000 chick) was operated with a total number of sessions at (180) production cycle, the rate of (5) sessions of productivity in the year.
- 35 farms represents the third production capacity (more than 10000 chick) was operated with a total number of sessions at (175) production cycle, the rate of (5) sessions of productivity in the year.

3. Results and discussion:

I. Factors affecting the production of broilers in Qaliubiya:

The factors affecting the production of chicken broiler farms at private sector in Qaliubiya governorate some inputs which are represented in each of: the number of chicks, the amount of feed, the size of human labor, medicine and veterinary care, electricity, heating, water, bedding. In addition to the terms of total revenue of Each of the main product

(fattening live chicken), the secondary product (chicken manure), and its impact on net income farm as well as the return on the investored pound, the rate of economic efficiency and profit margin for the product, from the fact that the available data made by the same field study in the provinces Banha, Tookh in Qaliubiya governorate, year 2009 for every three yield capacities [each individual], as well as on the total sample of the study.

Table No (1) shows the most important economic variables to produce one ton of the live fattening chicken for the various producing capacities and the total sample of study in the private farms in Qaliubiya governorate in 2009.

Table (1) the most important economic variables to produce a ton of different chicken broiler yield capacity and total sample farms in the private sector of Qaliubiya governorate in 2009.

Economic variables		Unit	First Capacity		Second Capacity		Third Capacity		Total sample	
			Value L.E / ton	% of total costs	Value L.E / ton	% of total costs	Value L.E / ton	% of total costs	Value L.E / ton	% of total costs
Chicks	Average	Chick	606.5	-	599.0	-	576	-	-	-
	value	LE	2318.7	29.4	2305.1	29.7	2295.7	30.2	29.7	29.7
Bedding	Amount	tone	2.48	-	2.44	-	2.39	-	-	-
	value	LE	4560.0	57.8	4501.4	58.0	4427.8	58.3	58.2	58.2
Employment	Number	Man / day	17.0	-	14.0	-	10	-	-	-
	wage	LE	204.0	2.6	163.1	2.2	112.2	1.5	2.1	2.1
Medicines and veterinary care		LE	539.0	6.8	529.5	6.8	519.4	6.8	524.7	6.8
Electricity, heating and water		LE	69.0	0.9	58.1	0.7	43.8	0.6	52.6	0.7
Bedding		LE	58.0	0.7	55.9	0.7	49.7	0.6	53.2	0.7
Rent and petty expenses		LE	141.0	1.8	145.2	1.9	152.4	2.0	145.3	1.8
Total costs		LE / ton	7889.7	100	7758.3	100	7601.0	100	7762.5	100
sell Price		LE / ton	8826.0		8797.0		8708.0		8759.0	
Manure income		LE / ton	93.0		86.0		75.0		85.0	
Total revenue		LE / ton	8919.0		8883.0		8783.0		8844.0	
Net return		LE / ton	1029.3		1124.7		1182.0		1081.5	
Return on the invested pound		LE	0.131		0.145		0.155		0.139	
Rate of economic efficiency		%	113.0		114.5		115.5		113.9	
Profit margin for the product		%	11.6		12.7		13.5		12.2	

Source: Compiled and calculated from the questionnaires to the field study in Qaliubiya governorate 2009.

1 - Number of chicks:

The numbers of chicks is the most important productive inputs, which depends upon the production of broilers, which is linked to the size of the farm. Table (1) illustrates that the average number of chicks needed to produce a ton of chicken broiler during the session-capacity productions first, second and third about 606.5, 599.0, 576.0 chick respectively, valued at about 2318.7, 2305.1, 2295.7 pounds, representing about 29.4, 29.7, 30.2 % of the total value of the total costs to produce a ton of chicken fattening district, amounting to about 7889.7, 7758.3, 7601.0 pounds for the three capacities respectively, with an average of 591.5 chick at a value of about 2308.1 pounds, represents 29.7 % of the total cost of $ 7762.5 pounds for the total sample.

2 - The amount of feed:

Table (1) shows the average amount of feed required to produce a ton of a chicken broiler during the three session-capacity production and the total sample of the study, which was about 2.48, 2.44, 2.39, 2.42 tons, valued at about 4560.0, 4501.4, 4427.8, 4519.1 pounds, representing about 57.8, 58.0, 58.3, 58.2% of the total value of the costs for each of the capacities of the first, second and third and the total sample of the study, respectively.

3 - Human labor:

Poultry farms require a well trained technical employment permanently to carry out agricultural operations of various cleaning, the laying of the bedding, and the implementation of medical care programs, which is recommended by the veterinarian. Thus the skilled labor is one of the most important inputs affecting the production of broilers, it was found from the same table that the average human labor used to produce a ton of chicken broiler live during the production session-capacity first, second and third and the total sample of the study, they were about 17.14, 10, 14 man / day / work respectively and the total remuneration amounted to about 204.0, 163.1, 112.2, 159.5 pounds, representing about 2.6 %, 2.2 %, 1.5 %, 2.1 % of the total overall costs for each of the three capacities and the total sample of the study, respectively.

4. Medicines and veterinary care:

Drugs and veterinary care are considered the most important inputs affecting the production of

broilers, which led for each farm to do a special program for drugs and veterinary care under the supervision of a veterinarian. This has been shown that the average expenditure of the farm on medicines and veterinary care to produce a ton of chicken broiler during the session-capacity productivity and the total sample, had amounted to about 539.0, 529.5, 519.4, 524.7 pounds, representing about 6.8 % for each of them respectively of the total overall costs, (Table 1).

5 - Electricity, heating and water:

As it is clear from the data in the same table, the farm average spend it are on all of the electricity, heating and water to produce a ton of chicken broiler during the three session-capacity yield and the total field study sample was about 69.0, 58.1, 43.8, 52.6 pounds, which presents about 0.9 %, 0.7 %, 0.6 %, 0.7 % of the total costs for each of them respectively.

6 - Bedding:

The average expenditure of the farm on bedding for the production of a ton of chicken broiler during the different session-capacity production and the total sample of the study to 58.0, 55.9, 49.7, 53.2 pounds, presenting about 0.7 %, 0.7 %, 0.6 %, 0.7 % of the total costs for each of them respectively.

7 - The selling prices of broiler chicken:

The selling price of poultry is determined, according to the interaction of the forces of supply and demand. Where, the poultry prices are affected by religious festivals and various events. The average selling price per ton of chicken broiler, during the three session-capacity production and the total sample of study about 8726.0, 8797.0, 8708.0, 8759.0 pounds / ton, each on order as the table (1).

8 - Net Return

Net revenue is one of the criteria of economic efficiency, where the product is always seeking to maximize net revenue. The table (1) shows the average net return of production cycle per ton of product of broiler chicken Quarter, at about 1029.3, 1124.7, 1182.0, 1081.5 pounds, for each of the productive capacities in the first, second and third and the total study sample, respectively.

9 - Return on the investored pound:

Table (1) shows that the return on the invested pound amounted to about 0.131, 0.145, 0.155, 0.139 pound in the session for the productive capacities of the first, second and third and the total sample of the study, respectively. It is clear that, the third production capacity is most economically efficient, and this is consistent with the economic logic in terms of benefiting of mass production.

10 - The rate of economic efficiency and profit margin of the producer:

As is clear from the data in the same table that, the rate of economic efficiency reached about 113.0 %, 114.5 %, 115.5 %, and 113.9 % for each of the productivity capacities the first, the second and the third also the total sample, respectively. While, the percentage of the profit margin for the product about 11.6 %, 12.7 %, 13.5 %, 12.2 % for the productive capacities of the first, second, third and the total sample of field study, respectively.

Second: The estimation of the standard functions for the production of broiler chicken farms on the level of productive capacities and the study total sample:

The production function reflects the relationship between physical factors of production used by the farm, and the final product of this farm. The production functions estimated by the double logarithmic equation as turned out to be the best models when compared to other models, in terms of their compatibility with the Economic and Statistical logics. In addition to that, the estimates of transactions are given directly productivity elasticities for each element of production involved in the function, which is useful in identifying the production stage, and the extent of economic efficiency. As well as, the possibility of derivation of marginal product for each item and the return on capacity, this is useful in determining the optimal levels of productivity.

The input of the productivity function in both the number of chicks during the session chicken (x 1), the amount of feed used in tons during the session (x 2), bedding values in pounds (x 3), the value of medicines and veterinary care per pound (x 4), value of electricity, heating and water in pounds (x 5), the size of human labor man / day / work (x 6), the rental value of farm production cycle in pounds (x 7). While, the productivity function output, in the amount of production in kilo gram of broiler chickens during the production cycle (y e^{8}).

1 - Estimation of the standard function of the productivity of the first productive capacity farms (< 5000 chick):

Estimating the function of the first productive capacity farms shown in the table (2), showing that the most important productive inputs affecting the quantity production of chicken broiler of a positive relationship: the number of chickens (x 1), the amount of feed used (x 2), electricity, heating, water (x 5), the size of human labor (x 6), has proved to be statistically significant when the input level of 0.1 except for the entrance of human labor at the level of 0.05, did not demonstrate significant Portal bedding and the rental

value of the farm, which may be due to the lack of direct impact on production. As explained in the function the negative impact of certain statistically significant at 0.01 levels to the entrance of medicines and veterinary care, which indicates the presence of excessive use of this portal, which means the need to rationalize its expenditure. As explained in the function estimated that the elasticities of productive elements: the number of chickens (x 1), the amount of feed (x 2) value of bedding (x 3), the value of medicines and veterinary care (x 4), value of electricity, heating, and water (x 5), the size of human labor (x 6), and the rental value of the farm (x 7) amounted to about 0.211, 0.681, 0.989, -0.042, 0.015, 0.053, - 0.815 pound for each of the previous inputs, respectively.?

The statistical significance of the function has been confirmed at 0.01 levels according to the F value, amounting to 2653.4. While, the adjusted coefficient of determination R^{-2} indicated that 89 % of the changes in the amount of production of broilers in that capacity, due to the inputs used. As well as, the total elasticity function for production estimated at 1.249 showed a relationship with Increasing returns to scale, means that an increase in overall production inputs function estimated at rate of 10 %, lead to increase the amount of output of live broilers by 12.49 %, Which means that the farm of the first production capacity was working in the first phase of the productivity function. This reach the fact that, the growing increase in production, by increasing the output of poultry meat greater than the rate of increase in the inputs. Nevertheless, it did not reach to the second phase of the function of productivity, where the growth rate was decreasing and that is the optimal stage of production.

2 – Estemation of the standard function of the productivity of farms production capacity second (5000: 10000 chicks):

Estimating the productivity function of the second capacity farms, table (2) show that the most important productive inputs affecting the production quantity of chicken broiler is the positive impact of each: the number of chickens (x1), the amount of feed used (x 2), medicines and veterinary care (x 4), the size of human labor (x 6). This has proved to be statistically significant when the input level of 0.1 With the exception of the entrance of human labor at a level of 0.05. The estimating yield function explained that production elasticity elements: the number of chickens (x 1), the amount of feed (x2), values Brush (x 3), the value of medicines and veterinary care (x 4), value of electricity, heating and water (x 5), the size of human labor (x6), and the rental value of the farm (x7), amounted to 0.198, 0.515, - 0.060, 0.038, 0.003, 0.012, - 0.041, for the previous inputs, respectively. The statistical significance of the estimating function has been confirmed according to the F value, amounted to 588.04. The adjusted coefficient of determination R^{-2} value indicated that, 91 % of the changes in the amount of production of broilers in that capacity may be due to the inputs, which were included in the function estimated production. Moreover, total elasticity function for production of estimated by 1.178 showed a relationship with increasing returns to scale, that means that an increase in total production inputs function estimated at rate by 10 %, lead to increase the amount of output of live broilers at 11.78 %, which indicates that the farm of the second capacity phase worked with the first stages of the production function

3 - Estimation of the standard function of the productivity of farms production of the third capacity of (<10000 chicks)

Estimating the yield function of the third farms capacity described in Table (2), showing that the most important inputs affecting the amount of production of broilers, is the positive impact of each of: the number of chickens (x 1), the amount of feed used (x 2), medicines and care Veterinary (x4), has proved to be statistically significant when the input level at 0.01, With the exception of the input of medicines and veterinary care at a level of 0.05. However, it has a negative impact of statistically significant at the level 0.01 for human labor (x6), which means the need to rationalize the expenditure on this entry and raising its efficiency. In addition the estimating function illustrated that the elasticities bedding producvity of inputs: the number of chickens (x 1), the amount of feed (x 2), thevalues of (x 3), the value of medicines and veterinary care (x 4), electricity, heating, and water (x 5), the size of human labor (x6), and the rental value of the farm (X 7), amounted to about 0.343, 0.648, - 0.084, 0.006, 0.015, - 0.085, - 0.0005, were confirmed an estimated statistically significance of function according to the F value, which amounted to 2123.91, and the adjusted coefficient of determination value R^{-2} is ? at 88 % of the changes in the production of broilers in this capacity due to the inputs used, included in the estimated production function, productivity, flexibility and describes the overall function, which amounted to 0.894 to reflect the relationship of decreasing returns to scale, which means the rule of the production relationship by increasing the production rate led to the decreasing in the amount of poultry meat, due to increased production elements.

Table (2): production functions estimated broiler chicken farms-capacity and productivity of the three and total sample Qaliubiya governorate 2009.

Productive capacities	The estimated model (production function	Sample size	Adj.R.sq	F	Sig. model	Total flexibility for the function
First capacity "<5000 chick"	$Logy_{t1}$=1.911+0.211LogX$_1$+0.61LogX$_2$+0.989LogX$_3$-0.042LogX$_4$+0.015LogX$_5$+0.053LogX$_6$-0.001LogX$_7$ (6.11)* (9.45)* (8.74)* (0.109) (-5.01)* (1.009) (2.73)** (0.811)	41	0.898	2653.40	*	1.249
Second capacity "5000-10000 chick"	Logyt2=2.257+0.198LogX1+0.515LogX2-0.060LogX3+0.038LogX4+0.003LogX5+0.012LogX6-0.041LogX7 (8.50)* (3.95)* (11.43)* (-0.003) (3.08)* (1.009) (2.71)** (-01.61)	36	0.915	558.04	*	1.178
Third capacity ">10000 chick"	$Logy_{t3}$=2.001+0.343LogX$_1$+0.648LogX$_2$-0.084LogX$_3$+0.006LogX$_4$+0.015LogX$_5$-0.085LogX$_6$-0.0006LogX$_7$ (7.25)* (4.16)* (7.64)* (-1.61) (2.52)** (1.81) (-3.05)* (-0.089)	35	0.881	2123.91	*	0.894
Total Sample	$Logy_{t4}$=1.827+0.714LogX$_1$+0.335LogX$_2$-0.025LogX$_3$+0.005LgX$_4$+0.019LogX$_5$+0.084LogX$_6$-0.003LogX$_7$ (23.64)8 (7.18)* (23.16)* (-0.219) (3.70)* (4.22)* (3.006)* (-0.008)	112	0.871	4372.09	*	1.102

Where: $Logy_t$ = Log. Of the estimated value of the quantity of production chicken broiler meat kg.
X1= Log. Of the number of chicks. "in chick"
X2 = Log. Of the amount of feed used "in ton"
X3 = Log. Of the Brush values used. "in L.E."
X4 = Log. Of the value of medicines and veterinary careare used. "in L.E."
X5= Log. Of the value of electricity and heating and water are used. "in L.E.".
X6 = Log. Of human labor used. "man/day/work" .
X7= Log. Of the rental value of the "L.E." during the productivity cycle.
t1 = 1,2, …. , 205, t2=1,2,…, 180 , t3= 1,2,…, 175, t4=1,2,…,560 productivity cycle
* : Significant at level 0.01 **: Significant at level 0.05
Source: Complied and calculated from the questionnaire of a sample field study in Qaliubiya governorate in 2009.

Table (3): functions, total costs and total revenue for the production of broilers governorate capacities at the level of productivity and the total sample of field study Qaliubiya governorate 2009

Productive capacities	Function	Equation	$\bar{R}^2$	F	Optimal size minimizing costs	Optimal size of profit maximizing	Flexuible costs
First Capacity (<5000 chick)	Total costs	$T.C_t$= 24.633 - 10.11y_t + 0.402y^2_t (6.520)* (-3.981)* (8.032)*	0.864	53.820	7.828	10.345	0.972
	Total revenues	$T.R_t$= 23.895 + 8.217y_t - 0.298y^2_t (0.216) (23.260)* (04.651)*	0.683	24.500			
Second Capacity (50000-10000 chick)	Total costs	$T.C_t$ = 53.209 - 0.098y_t + 0.194y^2_t (3.571)* (08.201)* (0.302)	0.591	19.202	16.561	19.779	0.917
	Total revenues	$T.R_t$ = 111.900 + 20.473y_t - 0.326y^2_t (2.700)** (15.020)* (-6.120)*	0.674	22.120			
Third Capacity (>10000 chick)	Total costs	T.C = 1238.521 - 3.092y_t +1.235y^2_t (1.214) (-3.207)* (0.501)	0.787	66.001	31.668	35.504	0.865
	Total revenues	$T.R_t$ = 279.301+153.552y_t - 0.971y^2_t (1.648) (4.408)* (-2.621)**	0.835	51.192			
Total sample	Total costs	$T.C_t$= 385.712 - 4.671y_t + 1.008y^2_t (8.126)* (-5.433)* (2.584)*	0.721	37.450	19.561	22.769	0.879
	Total revenues	$T.R_t$ = 1023.001 + 92.691y_y - 1.130y^2_t (1.611) (11.455)* (-7.002)*	0.764	28.911			

Where : $T.C_t$ = The total estimated value in thousands of L.E.
$T.R_t$ = estimated value of income in thousands of L.E.
y_t = amount of production of broilers in ton.
* Significant at level 0.01
** Significant at level 0.05
Sources: calculated from the questionnaires to the sample field study in Qaliubiya governorate 2009.

We can conclude that this capacity of those farms are located in the second stage of the production function, and this is consistent with economic logic and emphasizes that this is the economic capacity of production, and the increase of the total input rate of 10 % lead to increase the amount of output live broilers by 8.94%.

4 – The standard assessment of the productivity functions for the total farms of the study sample:

Estimating the yield productivity function of the farm, shown in the table (2) illustrated that, the most important inputs affecting the quantity of live broilers production are in the positive effect of each of the inputs: the number of chicks (x 1), the amount of feed used (x 2), the value of medicines and care Veterinary (x 4), value of electricity, heating, and water (x 5), the size of human labor (x 6). These inputs have been proved to be statistically significant at level 0.01. the estimated function explained that the elasticity's production inputs the number of chickens (x 1), the amount of feed used (x 2), the values of (x 3), the value of medicines and veterinary care (x 4), value of electricity, heating water (x 5), the size of human labor (x 6), and the rental value of the farm (x 7), amounted to 0.714, 0.335, - 0.025, 0.005, 0.019, 0.084, -0.003, for each of the previous inputs, respectively. The significance of estimated function has confirmed at the level of 0.01, according to the F value, which amounted to 4372.09. The adjusted coefficient of determination value indicated R^{-2} that the about 87 % of the changes in the amount of production of broilers are explained by the independent variables function estimated for the total sample. The total elasticity of productivity function, estimated at 1.102, reflects the relationship of the increasing returns to scale. This means that, an increase in the total inputs estimated function by 10 %, lead to increase the amount of output of broilers by 11.02 % in the total farm sample.

Third: The standard Estimation of the functions of costs and total income for broiler chicken farms on the level of productive capacities and the total sample of field study:

The economic theory shows that the total costs in the short term are a function of the volume of production by remaining of other variables as the same. To study the relationship between production and the overall costs of live broilers, the Estimation was done by mathematical quadratic, cubic equations, where they are more expressing to the relationship between production and costs in agricultural production in general. The quadratic model was more significant and consistent with the economic logic than the cubic model. Table (3) shows, the functions of costs and total revenue for production of broilers live at the level of the three productive capacities and the total field study sample.

1 – The standard Estimation of the functions of the costs and the total revenue for the first productive capacity of farms (> 5000 chick)

The cost function explained that, the total production of the first broilers capacitive production (Table, 3) that about 86 % of the changes in the total costs due to the change in the volume of production and in accordance to the adjusted coefficient of determination values R^{-2}. Also, demonstrated the calculated F value in the amount of 53.820 significant of the statistically estimated function at 0.01 level, and the total cost functions and total income can be reached to the optimal production size and the maximum size to profit as follows:

• Optimal productive size (costs civil) in the production of first broilers capacitive:

The optimum productive size can be estimated which decreasing the total cost, and achieved when marginal costs equal with the average costs, or at the lowest level of average production costs, which is achieve the to economic efficiency as follows:

The total cost function T.C = 24.633 - 1.011 x+ 0.402 x^2

Average-cost function A.C = 24.633 / x - 1.011+ 0.402 x

Marginal cost function M.C = -1.011+0.804 x

Assuming that the marginal costs = average costs

-1.011+0.804 x = 24.633 / x - 1.011+ 0.402 x then, 0.402 x = 24.633 / x and multiplying by x then, 0.402 x^2 = 24.633, then x= 7.828 tons

This means that the optimal size of production fro the first estimated productive capacity amounted to 7.828 tons of meat. This amount that reached the curve of average costs to the minimum, this means that the economic phase of production starts at this amount. The average production of broilers in this capacity has reached about 7.761 tons, and the estimated flexible costs for this capacity by 0.972, which means that the increase in production by 10 % lead to the increase of costs by 9.72 %, has achieved the optimum size of this capacity (24) farms, representing about 58.5 % of the total sample of the first capacity reached to (41) farms.

• The maxizing size of the profit in the first productive capacity of broilers:

The producer aims to achieve the maximum possible profit, and the maximizing size of profit can be calculated when the size of marginal costs equal to the marginal revenue (price) under the conditions of the free market. The estimation was done by

mathematical quadratic and cubic equations. The quadratic model was more significant than the cubic model. The marginal revenue function can be obtained by the first derivative of the differential function of total revenue:

Total revenue function TR = $23.895+8.217 x - 0.298x^2$

Marginal revenue function MR= 8.217x - 0.088x

The maximizing size of production profit can be obtained by equality of marginal costs and marginal revenue.

Marginal cost = marginal revenue

-1.011+0.804x = 8.217 - 0.088x

Then, 0.892 x= 9.228

x = 10.345 tons

Thus, the size of the maximum productive profit for the first capacity (> 5000 chick) is 10.345 tons of meat, which the marginal revenue equal with marginal costs, and the total revenue up to 8919 pounds. This has achieved this size of (14) farms, representing about 34.1 % of the total sample for the first capacitiy productivity of (41) farm.

2 - The standard Estimation of the total production costs and revenues functions for second capacity Farms II (5000-10000 chick)

The total production function of broilers for the second capacity production shown in (Table 3), 59 % of the changes in the total costs may be due to the change in the volume of production in accordance the values of the adjusted coefficient of determination R^{-2}. Also, the calculated F value estimated at 19.202, clarify the significance of the estimated statistically function at 0.01 level. From the total costs and total revenue functions, can reach the optimal size of production and size of the maximum profit as follows:

• productive Optimization size (minimizing costs) in the production of the second broilers capacity:

The total cost function T.C = $53.209 - 0.098x+ 0.194 x^2$

Average-cost function A.C = 53.209 / x - 0.098 +0.194 x

Marginal cost function M.C = -0.098+0.388x

Assuming that the marginal costs = average costs

-0.098+ 0.388x = 53.209/x - 0.098+0.194x

Then, 0.194x = 53.209/x and multiplying by x

Thus $0.194x^2 = 53.209$, then, x = 16.561 tons

As the optimal production size that minimize the total cost for the second capacity yield is about 16.561 tons, which is more than the average production for farms of that capacity of about 15.835 tons. This has achieved optimal size of (9) farms, representing 25 % of the total sample in this capacity which reached (36) farms. The elasticity coefficient of costs (0.917) showed that, the increase in production by 10 % lead to an increase in the total costs by about 9.17 %, and the production in this capacity is in the non-economic stage of production.

• The maximizing productive profit size in the production of second broilers capacity:

Total revenue function TR = $111.900+20.473x-0.326x^2$

Marginal revenue function MR = 20.473 - 0.652x

The size of maximizing profit is being by the equality of marginal costs with marginal revenue (price)

-0.098+0.388x = 20.473 - 0.652x

Then, 1.04x = 20.571, thus x= 19.779 tons

This means that the maximizing size of profit in the second productivity capacity (5000-10000 chick) was 19.779 tons of live meat, which equal the marginal revenue with marginal costs, and total revenue reached up to 8883 pounds. The maximizing size of profits has achieved (6) farmers representing 16.7 % of the total sample and the second productivity capacity of (36) farm.

3 - The standard Estimation of costs and total income functions for the third production capacity farms (> 10000 chick)

The total cost productivity function of the broilers for the third capacity, which is shown in the table (3) explained about 78 % of the changes in the total costs due to the change in the volume of production, according to the values of the adjusted coefficient of determination R^{-2}. Moreover, the calculated F value (66.001) demonstrated that the significance of the statistically estimated function at level of 0.01. From the total cost and total revenue functions can be reached to the optimal size of production and size of the maximizing profit as follows:

• The maximizing production size (costs minimizing) in the production of third broilers capacity:

The total cost function T.C = $1238.521 - 3.092x+1.235x^2$

Average cost function A.C = 1238.521/x - 3.092+1.235x

Marginal cost function M.C = -3.092+2.47x

Assuming that the marginal costs = average costs

-3.092+2.47x=1238.521/x - 3.092+1.235x

Then, 1.235x = 1238.521/x and multiplying by x

Thus $1.235x^2 = 1238.521$, then, x= 31.668 tons

Then the optimal productive Size which minimizes the total cost of third productivity capacity at 31.668 tons, which is more than the average production farms of that capacity, of about 30.225 tons. The optimal size has achieved (8) farmers, representing approximately 22.8 % of the total sample in this capacity and of (35) farms. The elasticity coefficient of costs (0.865) showed that the increase in production by 10 % lead to an increase in the total costs by about 8.65 %, and this is consistent with economic logic in terms of benefiting from economies

for capacity of large volume. The elasticity coefficient being [less than one], it means that production in this capacity is in the non-economic stage of production, where the average costs greater than marginal costs.

• The profit maximizing size in the production of third broilers capacity:

Total revenue function TR = 279.301+153.552x - $0.971x^2$

Marginal revenue function MR = 153.552 - 1.942x

The profit maximizing size is being by the equality of marginal costs with marginal revenue (price)

- 3.092+2.47x+153.552 -1.942x

4.412x = 156.644, then, x= 35.504 tons

Then the maximizing profit Size for the third productive capacity (<10 000 chick) is estimated at 35.504 tons of live meat, which equal the marginal revenue with marginal costs, and the total revenue reached up to 8783 pounds. The maximizing profit size has achieved (4) farms, representing about 11.4 % of the total sample of the third productivity capacity (35) farm.

4 - The standard Estimated costs and total income functions, for the total sample farms:

The total productivity cost function of live broilers at the same study sample, shown in the table (3) to about that 72 % of the changes in the total costs may be due to the change in the volume of production in accordance with the adjusted coefficient of determination values R^{-2}. In addition to the calculated the F value amounted at 37.450 illustrated the significance of the estimated statistically function at 0.01 level. From the total cost and total income functions can reach to the optimal size of production and the maximizing size of profit as follows:

• The optimal productive size (costs minimizing) in the production of broiler chickens with a total study samples:

The total cost function TC = 385.712 - $4.671x+1.008x^2$

Average cost function AC = 385.712/x- 4.671x+1.008x

Marginal cost function MC = - 4.671+2.016x

Assuming that the marginal costs = average costs

- 4.671+2.016x = 385.712/x- 4.671x+1.008x

Then, 1.008x = 385.712/x and multiplying by x

Thus, $1.008x^2$ = 385.712 then, x = 19.561 tons

Then, the optimal productive sizes, which minimize the total costs at the level of the total study sample was 19.561 tons, which is more than the average production with a total sample of 18.970 tons. The optimal size has achieved at the level of the total sample of the study (41) farm representing about 36.6 % of the total sample of (112) farm. the elasticity coefficient of costs was (0.879) showed that the production at the level same total study sample, achieved in the non-economic production, where the average costs greater than marginal costs, and that the increase in production by 10 % lead to an increase in costs by about 8.79 % .

• The maximizing size of the profit in the production of live broilers with the total study sample:

Total revenue function TR = 1023.001+92.691x- $1.130x^2$

Marginal revenue function MR = 92.691 - 2.260x

The maximum profit sized is being with the equality of marginal costs with marginal revenue (price)

- 4.671+2.016x= 92.691 - 2.260x

Then, 4.276x= 97.362, including x=22.769 tons

This means that the maximum profit size at the level of the total field study sample was about 22.769 tons of live meat, which equal the marginal revenue with marginal costs, and the total revenue reached up to 8844 pounds. The maximum profit size has achieved at the level of the total study sample (35) farm, represent 31.2 % of the total study sample that is (112) farms.

Fourth: the problems and obstacles facing the industry of fattening poultry in Qaliubiya governorate:

The poultry industry is like any other industry is facing many problems and obstacles. But, the different nature of the problems and constraints which facing the industry of fattening poultry beginning of production and technical processes in the production to the marketing of the final product. The research aims are to identify the most important problems facing the producers of broilers given in the study sample and their proposed solutions. These problems has been divided into three groups (productive - funding - and marketing) which can be viewed as follows :- based on the questionnaire of the field study sample.

1 - Problems and obstacles of production:

• The rise in the prices of all production requirements, which include:

- Instability & the components Increased feed prices and its and the difference of it from the standard measurements.
- The rise in prices of chicks with the decrease of the efficiency of broiler strains.
- The rise in prices of veterinary drugs and vaccinations.
- Increased costs for electricity and gas for heating.

• Non-availability of good chicks with enough high-output breeds.

• Non-availability of trained technical personnel as well as its higher wages.

• The spread of diseases and epidemics - particularly of avian flu in the winter - and the low efficiency of veterinary care.

2 - Problems and financial obstacles:
• A lack of currency and reduceding the size of self-financing.
• High interest rates on loans.
• A short period for repayment of the loans granted by the bank.
• Over-application of insurance and the rutin's obstacles.
• The large number of procedures for obtaining loans.
• The bank deducting the interest in advance.
• Decrease the size of self-financing.
• Faltering in payment at the illness.

3 - Marketing problems and obstacles:
• Magnitude of price fluctuations and the instability of the selling prices of broilers as a result of the manipulation of the wholesalers and brokers when buying them from farms.
• Lack of market information.
• Lack of capacity on equality with the difficulty of storing the final product until the improvement of the price also the lack of massacres that are not enough for production In addition to the price of the sale of poultry within the massacres less than the prevailing market price.
• Brokers and intermediaries controlling the marketing process and in the stock of poultry.
• reduced demand for poultry in the times of the spread of bird flu.
* In light of the problems and obstacles mentioned above the study recommends some proposed solutions to those problems, which is represented in the following:
1 - Good chicks with a high output breeds must be provided throughout the year.
2 - Providing the inputs at suitable prices, with supporting for the owners of these projects, especially in the area of finance, feed and veterinary care.
3 - Availability of the technical trained persons to raise the productivity performance of broiler chicken farms.
4 - Activating the role of the poultry producers union so that, it can adopt to protect and support the producers in the study area, especially since the majority of the those breeders are of small producers among the members of the General Union of Poultry in Egypt.
5 - The necessity of poultry stock to work to protect the consumer and the producer from price fluctuations, which are controlled by the brokers and intermediartors.
6 - encouraging the construction of projects to the complement of the projects of fattening and production of poultry in Qaliubiya governorate such as the establishment of feed factories and mechanical massacres to accommodate the production and provide it at intervals throughout the year and refrigerators for production storage, thus crises, does not happen whether fabricated or staged that the producer or consumer may not benefit from it, while the only beneficiary is the mediator.

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