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Evaluation of the productive performance of broiler herds - a field study in Diyala Governorate – Iraq for the production season 2020

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ABSTRACT

The research dealt with the study of the productive and economic performance of broiler farms in Diyala Governorate - Iraq for the 2020 production season, through a questionnaire conducted for a group of broiler breeders, whose number was (35) breeders out of a total of(360) products, they were randomly selected in order to know the status of production, costs and efficiency Farm management, and a multivariate productivity function model with value units was used to know the impact of production costs on production. The statistical and econometrics analysis showed an inefficiency in exploiting the available production capacities through the parameters of the estimated function, as it turned out that the slope of rented labor X2 towards production is high, as its value reached (2.875569), the slope of the feed purchase cost X3 in the estimated production function was (4.700436), while the other variables had a lower slope. The production performance indicators were also measured, which included the efficiency of food conversion, the economic indicator and the productivity index scale, as the economic index reached (27.8) and is considered low compared to the standard value that ranges between (170-200), while the value of the efficiency of food conversion was (1.6 kg of meat / kg of feed). Where the results showed the lack of sufficient knowledge of broiler breeders in the technical management of the broiler flock, as well as the misuse of the available productive resources. The study recommended increasing the number of the flock in the available production capacities according to scientific bases in order to achieve the reduction of fixed production costs and training broiler breeders on advanced technical methods To achieve efficiency in managing the broiler herd, thus minimizing production costs and maximizing profits.

INTRODUCTION

Poultry birds are small-sized animals with a fast production cycle, raised by humans in limited places. Poultry was selected by humans for the purpose of economic benefit. They include chickens, quail, turkeys, pigeons, ducks, geese, as well as ostriches in some countries. The original home of chicken breeds is southeast Asia in Indonesia and the Philippines. The human being was raised in India and then moved to other countries. (Al-Rabi'i and Al-Tuni. The year was not mentioned.P.3) Poultry farms need special specifications when established, due to their different nature from the rest of the other farms , because they contain inside them of devices, equipment and extensive numbers of chickens, and the consequent needs necessary for the growth of birds in a healthy, sound and natural manner, as well as the need to dispose of the resulting waste. General and specific engineering conditions for each poultry farm, so that it corresponds to the surrounding conditions and helps to reduce those conditions. (General Organization for Technical and Vocational Training.2008) Poultry meat is of higher nutritional value than other types of meat. It is

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economical meat, easy to prepare, and contains important nutrients in human nutrition. Its meat is distinguished by its content of all essential fatty acids and its proteins. In addition, poultry meat fibers are soft and easy to digest and can be introduced with different types of diets. (Al-Fayyadh.2010) Poultry farming projects have economic importance as they provide quick income to the product as they are quick capital turnover projects and help diversity income, especially after the development of broiler breeding methods, and help meet the increasing demand for poultry meat. The researcher Mohammed et.al. (2018) conducted a study in Iraq, from which he concluded that broiler production projects are economically profitable despite the high costs of production requirements in Iraq, provided that broiler fattening halls are used optimally, as these projects lead to investment development and meet the increasing demand for meat The white. Researcher Dolberg (2015) concluded in a study targeting the impact of poultry projects on reducing poverty, achieving development and improving livelihoods, that small and medium poultry projects help to increase income and improve the standard of living and then form productive capital. In another study conducted by M. & H. (2006), the study aimed to analyze the production costs of broiler production projects in Turkey. The researcher found that the high variable costs of production lead to reduced profits, and the high costs were due to the import of production requirements such as feed and chicks, as they bear taxes and transportation costs in addition to their prices.

Research problem

Despite the economic importance of poultry meat production projects, they did not achieve a profitable income for producers due to the high costs of production requirements, which led to high variable production costs as well as a low level of efficiency in the use of productive resources due to poor management of the farm.

Research objective

The study aims to apply economic standards and production indicators to know the state of production and costs for broiler breeding production farms by knowing the size of expenditures and the efficiency of farm management in achieving optimal use of production resources**.**

The importance of the research

The study of broiler breeding production projects is one of the important studies, as it achieves diversification of income for the farmer, as it does not need a long period to achieve production. Accordingly, the study of these projects sets scientific indicators for broiler breeders in making decisions and improving production efficiency in order to achieve maximizing profits.

MATERIALS AND METHODS OF WORK

1 - A questionnaire was conducted with (35) breeders of poultry meat producers, through a personal interview, who were randomly selected in Diyala Governorate.

2 - Data were collected on the number of marketed broiler breeding, the size of the herd, the mortality rate, the costs of raising and fattening one meal, the value of depreciation of assets, the costs of agricultural work and data on the care of the broiler flock.

3 - The questionnaire forms were unloaded into tables, classified and analyzed using the programs (Excel and Evieos).

RESULTS AND DISCUSSION

First: Economic evaluation of broiler breeding projects:

The production of a specific commodity requires the synergy and contribution of a number of production factors such as labor, capital, land, farm management and organization in the production of this commodity to satisfy the needs of the consumer directly, and production means the technical relationship that exists between the productive factors and a certain amount of the produced quantity of the good or service. (Al-Afandy.2012)

The production function means the mathematical relationship that shows the quantity expected to be obtained from the output. Since the simplest forms of production functions are the traditional function. (Abu Shawar et al. 2011)

The economic model consists of a set of variables whose amount changes due to influencing factors, and the constants, an amount whose value does not change, in addition to the model

parameters. (Al-Hayali.2012) Accordingly, the production function model can be formulated as follows:

$Y = F(X_1, X_2, X_3 \ldots . X_n)$

The factors of the function are:

F = function constant

Y = production quantity / kg

X1 = variable costs / dinars

X2 = Labor costs / dinars

X3 = cost of feed consumed / dinars

X4 = The value depreciation of assets / dinars

Since (Y) is the marketed produced quantity of broilers, (X1) are the variable costs, including the costs of medicines, veterinary supervision, the costs of the floor covering, the costs of buying and transporting chicks, fuel costs and maintenance costs, and they were collected in one variable because they are paid once, (X2) Labor wage costs ,(X3) Including the costs of feed consumed during the breeding period, (X4) The value depreciation of assets. The estimated function was as follows:

LOG(Y) = 0.0909237128384+ 0.0862246644628*LOG(X1) + 0.438754918619*LOG(X2) + 0.54159274338*LOG(X3) - 0.00933087067551*LOG(X4)

As for the statistical and standard measures of the estimated model, they are as shown in Table (1):

Table (1): the estimated production function of broiler production projects in Diyala Governorate

Statistical and Standard measures	The value
(t) For X_1 *	0.639471
(t) For X_2 **	2.875569
(t) For X_3 **	4.700436
(t) For X_4 *	-0.403421
R^2 Adjusted R	0.979230 0.976365
F	341.8134
D.W **	1.292846

***significant at 0.25 ** significant at 0.05**

Statistical and standard Analytics:

The statistical analysis showed the significance of the parameters of the estimated model through the (t) test, at a level of significance of 0.25 and a level of significance of 0.05, as its calculated value is greater than its tabular value.

The analysis also showed the significance of the productivity function through the(F) test, as its value amounted to 341.8134 and at a significance level of 0.05 and degrees of freedom of (4). So the coefficient of determination R^2 explained that 97% of the production changes were caused by the production factors included in the estimated function model, while the remaining 2% were due to factors that were not subject to quantification by the function.

The analysis also showed the absence of a problem of autocorrelation between the residuals through the Durban Watson test, as its value is(2 > D.W. > du) where it is in the acceptance region and this rule proves that there is no autocorrelation between the residuals. (Bakhit and Fath Allah. 2006. pp. 88-291)

In order to detect the existence of the problem of heterogeneity of the error boundary variance that appears in the cross-sectional data, the Breusch-Pagan-Gold Frey test was conducted using the Eviews program, and the results were as follows:

Table (2): shows the results of the Breusch-Pagan-Goldfrey test to test for the existence of the error term heterogeneity problem

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	8.213888	Prob. F(4,30)		0.0001
Obs*R-squared	18.29503	Prob. Chi-Square(4)		0.0011
Scaled explained SS	27.38350	Prob. Chi-Square(4)		0.0000
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 12/15/21 Time: 22:47				
Sample: 1 35				
Included observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.088885	0.071054	-1.250946	0.2206
LOG(X1)	0.010202	0.012467	0.818292	0.4196
LOG(X2)	-0.037229	0.013291	-2.800956	0.0088
LOG(X3)	0.032697	0.013144	2.487551	0.0186
LOG(X4)	-0.007667	0.004801	-1.596868	0.1208
R-squared	0.522715	Mean dependent var		0.003941
Adjusted R-squared	0.459077	S.D. dependent var		0.008070
S.E. of regression	0.005936	Akaike info criterion		-7.284124
Sum squared resid	0.001057	Schwarz criterion		-7.061932
Log likelihood	132.4722	Hannan-Quinn criter.		-7.207423
F-statistic	8.213888	Durbin-Watson stat		1.401375
Prob(F-statistic)	0.000134			

It can be ascertained that there is no problem of error boundary variance by multiplying the value of the coefficient of determination R^2 of (0.522715) by the number of Samples of (35), so the result will be 18.274025 and by comparing this result with the probability value of (Prob. Chi-Square), if it is:

Prob. Chi-Square < 0.522715, which we obtained means that there is no problem of error boundary variance and vice versa if the value is greater. (Al-Sawa'i.2011)

Economic Analysis

Through the analysis, it became clear that the effect of each of the total variable costs, feed costs and labor costs is positive on the produced quantity of broiler broilers. As for the value depreciation of assets, their impact is negative on the volume of production, and this is consistent with the logic of economic theory, as assets are fixed capital and depreciation in assets causes Increasing maintenance expenses and decreasing production efficiency, and then decreasing profits. (Al-Afandy . Previous source. p. 225) The results are consistent with a study by Mahmood et.al. (2019) in Iraq, in which the economic and descriptive analysis of production costs and classification of production capacities according to the number of broilers were used. The researcher concluded that the capital recovery period ranged between 1.6 - 2.4 years, and the invested dinar achieves returns of 1.3 - 1.5 dinars, although the costs Variable costs constitute a larger proportion of the fixed costs in poultry production projects as a result of importing a large portion of production

requirements. Also, Ngozi & Chinonso (2013) conducted a study in Nigeria targeting broiler production projects in villages, in which the researcher used the multiple regression model. He concluded that the low percentage of agricultural capital, such as cash, causes the lack of feed quantity and the lack of veterinary care, in addition to the poor agricultural methods and the spread of diseases, which leads to the emergence of Economic losses in the short and long term. (Hussein and other.2014) concluded in a study conducted on (77 broiler farms) in the United Arab Emirates that the efficient use of resources reduces production costs and maximizes profits, in addition to good growth standards in raising broiler chickens. He also indicated that feed constitutes the largest proportion of production costs. Therefore the use of expenditures must be rationalized to achieve the optimum combination. In a study conducted by (Al-Anbari.2010) at the College of Agriculture - University of Baghdad, the researcher used two methods of breeding chickens to measure the correlation of some enzymes on the economic characteristics of the chicken. The researcher found a relationship between weight gain and the chicken variety, whether local or imported. Breeding if it is a floor or cages method on the weight of the live body.

Second: Evaluating the productive performance of broiler herd

The productive performance of the meat broiler herd depends on several factors, including the average live weight when marketing, the number of deaths and the efficiency of food transformation. Therefore, the following criteria have been adopted as a measure of the productive performance of the herd. (Al-Fayyad. 2010. Previous reference)

1 - Vitality Ratio = 100 - Depreciation Ratio

2 – The scale of the productive guide

$$= \frac{\textbf{Average body weight (g)} * \textbf{vital ratio}}{\textbf{Breeding period X Food conversion efficiency X 10}}$$

3 – Efficient food transformation

$$= \frac{\textbf{Total weight of feed consumed during the rearing period (kg)}}{\textbf{Total live weight of marketed birds (kg)}}$$

$$\textbf{4 - The economic indicator} = \frac{\textbf{Total weight of marketed birds (kg)}}{\textbf{(Number of marketed birds)*(length of breeding days) * Food conversion efficiency}}$$

Data of the studied samples:

Table (2): indicators of evaluating the productive performance of the studied samples

S	Pointers	Average quantities and the number
1	Average live body weight	2161 g
2	Average number of deaths	141 bird= 2.47%
3	Average length of the rearing period	38 day
4	Average amount of feed consumed during the rearing period	20870 Kg
5	Average weight of the herd when marketing	12692 Kg
6	Average number of sedative chicks	5955 A chick
7	Average number of broilers marketed	5818 bird

Reference: Researcher depending on the questionnaire.

For the purpose of finding the scale of the productive index, the percentage of vitality must be found in the following law:

1 - Vitality Ratio = 100 - Depreciation Ratio

= 100 – 2.37 = 97.63 %

$$\textbf{2 – Efficient food transformation} = \frac{\textbf{Total weight of feed consumed during the rearing period (kg)}}{\textbf{Total live weight of marketed birds (kg)}}$$

$$= \frac{20870\ Kg}{12692\ Kg} = \textbf{1.6 kg feed for each kg marketed meat}$$

$$3 - \text{The scale of the production guide} = \frac{\text{Average body weight (g)} * \text{vital ratio}}{\text{Breeding period} * \text{Nutritional conversion efficiency X}}$$

$$= \frac{(1261) * (97)}{(1.6) * (100) * (38)}$$

$$= \frac{209617}{6080} = 34.4 \text{ The value of the production manual}$$

$$4 - \text{The economic indicator} = \frac{\text{Total weight of marketed birds (kg)}}{\text{(Number of marketed birds) * (Length of breeding period) * Food transfer efficiency}}$$

$$= \frac{12692}{(5818) * (38) * (1.6)} = 27.8 \text{ Economic Index Value}$$

(Al-Fayyad. 2010 p. 50) confirms that the optimum limit for the scale of the production index and the economic indicator ranges between (170-200) in typical conditions that are completely controlled and that this value is not available in the prevailing conditions that are not typical for breeding and fattening broiler meat. As for the lower value than the limit The optimum for the two measures mentioned means poor management, which causes deteriorating health of the herd, high declines, and lower body weight rates. The results of the herd performance evaluation indicators are identical to what was reached in the results of the productive function and economic analysis, as its effect was negative on the produced quantity, which caused low production and high production costs. It also affirms (the General Organization for Technical and Vocational Training. Previous reference) that one of the factors affecting the production of poultry meat is the cost of feed, which constitutes the largest proportion of the variable costs, and that technical and trained labor and supervision of the production herd achieve efficient production.

CONCLUSIONS

1 - Through the emergence of the negative impact of the equipment depreciation value variable (X_4), it is clear that the fixed costs of the unit produced have risen, and this indicates the misuse of the production capacity in an optimal use.

2 - Vital indicators, the scale of the production index, and the economic indicator gave results that did not approach the optimal limits, which means poor management of broiler production farms and a failure to achieve compatibility between mixing production factors and the technical method for dealing with the herd.

3 - The food conversion efficiency of broiler farms reached (1.6) per to 2 kg of feed, and this is acceptable from the producer's point of view.

RECOMMENDATIONS

Based on the conclusions, the study recommends the following:

1 - Increasing the number of broiler flocks in the available production capacities with the aim of reducing fixed costs and consequently decreasing the value of depreciation of fixed assets, as it has an inverse relationship with the volume of output.

2 - Developing the skills of poultry breeders in the study region, which contributes to improving the technical method in dealing with the herd, reducing the number of perils and increasing the live weight rate of the herd.

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تقييم الاداء الانتاجي لقطعان فروج اللحم دراسة ميدانية في محافظة ديالى- العراق

امنة عبد الاله حمدون

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الخلاصة

تناول البحث دراسة الاداء الانتاجي والاقتصادي لمزارع انتاج الفروج اللاحم في محافظة ديالى – العراق, من خلال استبيان تم اجراءه لمجموعة من مربي الفروج اللاحم بلغ عددهم (35) مربي تم اختيارهم بشكل عشوائي , وتم استخدام انموذج الدالة الانتاجية متعددة المتغيرات وبوحدات قيمية لمعرفة اثر التكاليف الانتاجية على الانتاج ,اظهر التحليل الاحصائي والقياسي وجود عدم كفاءة في استغلال السعات الانتاجية المتاحة .كما تم قياس مؤشرات الاداء الانتاجي التي شملت كفاءة تحويل الغذاء والمؤشر الاقتصادي ومقياس الدليل الانتاجي واوضحت النتائج عدم وجود معرفة كافية لدى مربي الفروج اللاحم في الادارة الفنية لقطيع الفروج اللاحم كذلك سوء استغلال الموارد الانتاجية المتاحة, اوصت الدراسة بزيادة عدد القطيع في السعات الانتاجية المتاحة وفقًا لأسس علمية بما يحقق تدنية التكاليف الانتاجية الثابتة وتدريب مربي الفروج اللاحم على الاساليب الفنية المتطورة لتحقيق كفاءة في ادارة قطيع الفروج اللاحم وبالتالي تدنية التكاليف الانتاجية وتعظيم الارباح .

الكلمات المفتاحية:
الفروج اللاحم . الاداء الانتاجي . تحليل اقتصادي . كفاءة الادارة.