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ECONOMIC ANALYSIS OF PRODUCTION RISKS FOR BROILER BREEDING PROJECTS IN IRAQ FOR THE YEAR 2021 (BAGHDAD PROVINCE AS A CASE STUDY)

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ABSTRACT
The study aimed to estimate the production function and its economic derivatives for broiler breeding projects, measure the efficiency of the resources used in the production of broilers, and determine the behavior of broiler project breeders toward the risks they are exposed to in the study area by adopting the risk avoidance criterion (Ks). The study relied on primary data from its field sources in the light of a questionnaire prepared for this purpose and through direct interviews with broiler breeders in the Baghdad governorate for one production year (2021). Data were collected randomly from (64) projects out of a total of (546) projects in Baghdad governorate Which is, (11.72%) of the total projects. The results indicated that the projects of broiler breeders in the study area were efficient in the use of forage, the number of chicks, and human work, as the ratio of resource efficiency was close to the correct one, while they were incompetent in the use of medicines and vaccines. Cheap commercial medicines and treatments in treating chicken diseases. The analysis of the behavior of broiler breeders toward risks included the percentage of breeders' preferred risk (90.6%), and the percentage of breeders' preferred medium risk (9.4%). Many breeders prefer to take risks. The study recommended the necessity of providing adequate government support to the owners of broiler breeding projects by providing loans and financial advances.

Keywords: production function, production risk, resource efficiency, avoid the risk

1. INTRODUCTION
Poultry farming is an industry that has an importance and impact on the national economy and plays a key role in securing animal protein from meat and eggs of high nutritional value and at acceptable prices when compared to the prices of meat and other animal derivatives. What increases the importance of poultry meat is that it contains a high percentage of protein, as the percentage in cooked meat ranges between 25-35% in broilers and 21-27% in cows, compared to 21-24% in sheep with a low percentage of fat as well as being easy to digest as The percentage of fat in it is estimated (5%), while beef contains three times the percentage of cholesterol, in addition to containing a high percentage of salt. Poultry projects are characterized by the speed of the production cycle and the cheapness of poultry products compared to livestock products, and then the speed of the capital cycle. Any activity is characterized by a degree of risk that varies according to the type of activity, its size, and its characteristics, as well as the factors affecting it. Experience

also plays an important role in reducing the risks facing the agricultural sector. Therefore, the decision maker must take into account these risks when making any decision related to economic activity. Broiler breeding projects are characterized by a high degree of risk, including production risks and price risks, such as the high prices of feed, chicks, and other production requirements and the exposure of birds to many infectious diseases that may eliminate the entire flock and the wide fluctuations in the prices of broilers, which is reflected in fluctuation and instability Broiler production and many breeders stopped production. Baghdad governorate ranked first, as it produced an amount of 223 thousand tons, or 16.75% of the total production in Iraq, which is a relatively high percentage that shows the importance that the governorate enjoys in terms of production. Despite the expansion taking place in broiler breeding projects in Iraq and the noticeable increase in the produced quantities, the achieved production does not cover the need for the increased demand for this commodity. In addition, there are multiple and varied problems faced by the breeders of these projects that cause them many risks and production challenges that affect It affects the performance of producers and the returns they achieve and lead to the reluctance of many breeders from production and the closure of those projects. The importance of the research lies in analyzing the productive and price risks facing broiler breeding projects and reaching results that help breeders in studying appropriate procedures and making sound decisions in this field, thus enabling them to develop appropriate policies as well as optimal economic planning for the advancement of the poultry sector. Previous local, Arab and international studies have focused on studying the production function AL- Ukeili et al. 2015; Ghazal et al. 2012; Mahmood 2018, Mahmood et al. 2018, Mohammed et al. 2015, Obaid 2011, Zaidan 2015) and the production risk (Akinniran 2017, Farhan et al. 2016, Farhan 2013, Fufa 2003, Hilal et al. 2011, Koundourim et al. 2005, Olarinde et al. 2007, Roll et al 2006, Sadiq et al 2018, Salem 2008). The study aimed to estimate the production function and its economic derivatives, calculate the efficiency of the resources used, and determine the behavior of broiler breeders toward the risk they are exposed to. The Pareto curve was used to determine the importance of the problems facing farmers in the process. Productivity. The research is based on the hypothesis that broiler breeding projects have good economic returns, but they are exposed to great risks.

2. MATERIALS METHODS

2.1 Data collection

The research relied on primary data in a questionnaire prepared for this purpose, collected in a personal interview with broiler breeders in Baghdad governorate. A total of 64 questionnaires were collected, representing 11.72% of broiler breeders in the governorate for the year 2021.

2.2 Data analysis

The production function and economic derivatives were estimated using the Eviews.12 program. The broiler breeder's behavior towards the risks they are exposed to was determined. The Pareto curve was used through SPSS.25 program.

2.3 Production function

The term function is used in mathematics to express the relationship between two or more variables. It refers to the maximum possible output that the firm can produce during a certain period of time under a set of production factors (Debertin 1986). The relationship between output and production factors can be represented in the form of graphs, mathematical equations, or numerical tables (AL-Shafi'I 2005). In brief, it can be said that the production function is the technical relationship that links the productive elements used in the production process and the output. It can be expressed in many forms, each of which shows the maximum amount of output that can be obtained using a certain set of available production factors, assuming stability of the technical level, especially in the short term, during a certain period of time. The production function of broiler breeding projects was estimated using the least squares method (OLS) to estimate the model parameters. This method is considered one of the most commonly applied methods in estimating the relationships in economic models. That is because it their merits as unbiased, have a maximum variance, and the easiness in performing the arithmetic calculation. Several models, including the linear function, the double logarithmic function, and the semi-logarithmic function, have been formulated for the purpose of representing the relationship between the total output of broiler breeding projects as a dependent variable, and (the number of broilers, the number of chicks, medicines, and vaccines, number of human working hours) as independent variables. The results of the study showed that the Double Log Function is the most consistent function with economic logic and is representative of the relationship in terms of passing statistical and standard tests. After conducting the statistical analyses using the Eviews.12 program, it was possible to estimate the production function of broiler breeding projects according to the following model:(Doll 1984)

$$LY = \beta_O + \beta_1 Lx_1 + \beta_2 Lx_2 + \beta_3 lx_3 + \beta_4 lx_4 + \varepsilon_i \dots\dots (1)$$

The dependent variable (Y) represents the total production of broilers (tons).

The independent variables (Xs) include the following variables:

1- Amount of feed (X_1): represents the actual quantity of forage used, estimated in (tons).

2- The number of chicks (X_2): represents the number of chicks in one cycle.

3- Quantity of drugs and vaccines (X_3): represent all drugs and vaccines that were used during the production year, estimated in (liters, and vials, respectively).

4- The number of human work hours (X_4): represents manual labor services (family and wages in hours).

As for the random variable (Ui), it includes all other variables that affect the production of broilers and were not included in the model, such as climatic, environmental, and technical conditions…etc.

2.4 Risk Function

The description of the function includes determining the dependent variable and the independent variables affecting it, and to estimate the production risk functions for broiler breeding projects, the following variables were chosen as the most influential variables in the models adopted in estimating broiler production risk functions (amount of broiler production, number of chicks, medicines, and vaccines, number of hours human labor) as well as including qualitative variables represented by the educational level and the number of years of experience for educators. The results of the study showed that the Double Log Function, which is the most consistent with economic logic and representative of the relationship in terms of passing statistical and standard tests, as follows:

$$(\varepsilon_i^2) = ln\beta_O + \beta_1 lnX_1 + \beta_2 lnX_2 + \beta_3 lnX_3 + \beta_4 lnX + \delta_1 D_1 + \delta_2 D_2 + + \varepsilon_i \dots (2)$$

Where:

ε_i^2: Production risk (residual square of the estimated production function)

X_1: the quantity of the feed (tons).

X_2: The number of chicks.

X_3: Quantity of medicines and vaccines (liters and vials, respectively).

X_4: The number of human working hours (worker/hour).

D_1: Number of years of experience. ((<35=0, ≥35=1))

D_2: educational level (primary = 0, intermediate = 1, middle school = 2, university and above = 3)

δ_1 : parameter of the qualitative variable.

β_0: constant limit parameter.

β_i: Parameters of the explanatory variables

ε_i: the random variable.

For analyzing the behavior of breeders against production risks and classifying them into the three risk categories (risk preferred, natural risk, and risk-averse), the formula for the risk aversion criterion (Ks) was applied. It is calculated according to the following relationship (Moscardi 1977).

$$K_{(s)} = \frac{1}{CV}\left(1 - \frac{pxi.xi}{py.fi.\mu y}\right) \dots\dots (3)$$

Where:

$K_{(s)}$: the value of the risk aversion parameter (increasing the value of K(s) means risk avoiding or less risk)

CV: coefficient of variation (y) for the quantity of broiler production

pxi: The price of the most influential resource (amount of feed)

xi: The quantity of the most influential resource (amount of feed)

py: output price

fi: production flexibility

μy: average production (per project)

The behavior of producers toward risk is classified into three groups based on the value of the risk aversion parameter $K_{(s)}$ which are:

- Risk preferred producers when $0 < K_{(s)} < 0.4$

- Producers prefer the natural risk (intermediate) when $0.4 < K_{(s)} < 1.2$
- Risk-averse producers when $1.2 < K_{(s)} < 2$

For the purpose of determining the behavior of breeders towards risks and classifying them within the categories that are determined in light of the value of the risk-avoidance parameter $K_{(s)}$, the coefficient of variation (C.V) was calculated. This coefficient is a relative (or standard) measure of risk because it links the ratio of the risk of the variable (the standard deviation) and the average values of the variable (the arithmetic mean), that is, the higher the value of the coefficient, the higher the risk. The coefficient of variation is calculated according to the following formula:

$$C.V = \frac{\delta\gamma}{\mu y} \ldots\ldots (4)$$

Where:
C.V: Coefficient of variation
$\delta\gamma$: Standard deviation
μy: Average production

3. RESULTS AND DISCUSSION

3.1 Economic and statistical analysis of broiler production projects

The production function of broiler breeding projects was estimated using the least squares method (OLS) to estimate the model parameters. Several models, including the linear function, the double logarithmic function, and the semi-logarithmic function, have been formulated for the purpose of representing the relationship between the total output of broiler breeding projects as a dependent variable, and (the amount of broiler, the number of chicks, medicines, and vaccines, number of human working hours) as dependent variables. The results showed that the Double Log function was the most consistent function with economic logic. The statistical analysis conducted using the Eviews.12 program disclosed that it was possible to estimate the production function for broiler breeding projects according to the following model:

Table1. Estimated parameters of broiler production function according to the double logarithmic formula

Dependent Variable: LY
Method: Least Squares
Date: 05/21/22 Time: 19:39
Sample: 1 64
Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.494850	0.208791	-2.370079	0.0211
LX1	0.419642	0.064120	6.544654	0.0000
LX2	0.362075	0.084984	4.260496	0.0001
LX3	0.177290	0.075880	2.336456	0.0229
LX4	0.074082	0.036685	2.019446	0.0480

R-squared	0.978307	Mean dependent var	3.311987
Adjusted R-squared	0.976836	S.D. dependent var	0.879762
S.E. of regression	0.133898	Akaike info criterion	-1.108575
Sum squared resid	1.057790	Schwarz criterion	-0.939912
Log likelihood	40.47438	Hannan-Quinn criter.	-1.042130
F-statistic	665.1795	Durbin-Watson stat	1.487329
Prob(F-statistic)	0.000000		

Source: Calculated using Eviews.12

In order for the model to be accepted and approved in the interpretation of the studied phenomenon, it is necessary to conduct diagnostic tests on this model. The results indicated that the model exceeded all standard tests such as the lack of autocorrelation using the Durbin-Watson test, as the value of (D) was located in the area of acceptance of the null hypothesis as it reached (1.487). From the D.W table for 5% level of significance and 240 degrees of freedom, we find that D lies between 1.314 < 1.487 < 1.568 i.e., du < D < 4-du, from which we conclude that there is no positive or negative autocorrelation for the first-degree random variable. On the other hand, it was found that there is no linear correlation problem using the variance inflation factor (VIF) as its value is less than 10, which indicates that it is not inflated. Thus it is an indication that there is no problem of linear correlation between the independent variables of the production function (Gujarati 2004). Given thecross-section data of the study, it is necessary to reveal the problem of instability of variance using the statistical program Eviews 12. The BPG test was applied which proved insignificant of F-statistic. Accordingly, it can be concluded that the estimated model does not suffer from heteroscedasticity.

Table 2. Coefficient of variance inflation factor.

Variance Inflation Factors
Date: 05/21/22 Time: 08:14
Sample: 1 64
Included observations: 64

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.043594	155.6161	NA
LX1	0.004111	203.2126	9.031222
LX2	0.007222	192.0321	7.331962
LX3	0.005758	421.6265	5.282673
LX4	0.001346	276.4921	4.451233

Source: Calculated using Eviews.12

Table 3. The BPG test shows a heteroscedasticity problem.

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	1.441415	Prob. F(4,59)	0.2317
Obs*R-squared	5.697497	Prob. Chi-Square(4)	0.2229
Scaled explained SS	3.477297	Prob. Chi-Square(4)	0.4813

Source: Calculated using Eviews.12

After making sure that the estimates are consistent with the logic of the economic theory, statistical tests were used to test the validity of the estimated model. The t-test proved the statistical significance of these inputs at the level of 1%, and the F-test proved the significance of the function as a whole at the probability level < 0.001, while the coefficient of determination showed that (97.8%) of the changes in the quantity of production are due to the studied explanatory variables, while 2.2% of the changes in the quantity of production were due to other factors that were not included in the model, such as education,
experience, age, family size, and others.

It can be noted from the estimated results in table no (1) that the production function of broiler breeding projects was as follows:

$$\ln Y = -0.494 + 0.419\ln X_1 + 0.362\ln X_2 + 0.177\ln X_3 + +0.0740\ln X_4 \ldots (1)$$

The parameters (b_1-b_4) indicate the partial productive elasticities, as the function was estimated in the double logarithmic form of the previously mentioned elements. These elasticities show the extent of the relative response that occurs in the total production of broiler breeding projects to the changes that occur in the quantity of the productive element by 1% with the stability of the other factors. Furthermore, the sum of the elasticities gives the overall flexibility of the function, which refers to the nature of the return to scale, including the production stage in which production takes place, and then the efficiency of the use of productive resources.

It was found from the production function of broiler breeding projects that the total elasticity value amounted to (1.033), which is greater than the correct one. That Implies there are increasing capacity returns, which means that it allows the possibility of increasing the production of broiler breeding projects in ascending mode when adding the resources in even proportions. In other words, the increase in resources leads to an increase in production at increasing rates, and this means that the breeders of these projects produce within the first productive stage of the law of diminishing returns. As it is noted from the production function table of broiler breeding projects all the variables represented (the quantity of the feed, the number of chicks, the number of medicines and vaccines, and human labor) are used in the second stage (the economic production stage) as long as the marginal product is decreasing and less than the declining average production is also.

The results of the production function of broiler breeding projects indicated that the signals of all parameters are consistent with the economic logic. It was found that the productive elasticity of the broiler feed was about (0.419), which is a positive value and less than half due to the frequent use of this resource, and this means that the increase in feed quantity resource by (1%) leads to an increase in the production of broiler breeding projects by (0.419%). The productive flexibility of the number of chicks showed a positive value, which amounted to about (0.362), meaning that the increase in the number of chicks by (1%) leads to an increase in the production of broiler breeding projects by (0.362%). As for medicines and vaccines, it amounted to (0.177), meaning that the increase in the number of medicines and vaccines by (1%) leads to an increase in production by (0.177%). Also, the productive elasticity of human working hours, which amounted to (0.074) is also a positive and low value due to the intensification of the use of this resource. This means that the increase in the number of human working hours by (1%) leads to the production of broiler breeding projects by (0.271%).

From the foregoing, it can be concluded that the productive elasticity of the production resources represented by the number of human working hours and the number of medicines and vaccines is the least compared to the productive elasticity of the feed and the number of chicks. The productive elasticity of feed was greater than that of the chick's number. Thus, an increase in the feed will lead to an increase in the production of broiler breeding projects, greater than the increase in the number of chicks.

In order to find out the share of each factor of production, the value of the estimated elasticity for each factor is divided by the total elasticity of the function. The results showed that the quantity of feed came first, followed by the number of chicks, then the number of medicines and vaccines, and lastly the number of human working hours amounted to (40.65%, 35.04%, 7.13%, 7.16%) respectively.

3.2 Economic Derivatives of the Production Function

The production function includes some derivatives, the most important of which are derivatives that are very necessary for decision-making in terms of adding or decreasing a resource. The economic derivatives which are of great importance in determining the efficient resources that are used in the production process are: -

- Average production
- Marginal production
- Elasticity of production

To find the economic derivatives, the production function must be converted from its logarithmic form to the exponential form:

$\ln Y = -0.494 + 0.419\ln X_1 + 0.362\ln X_2 + 0.177\ln X_3 + +0.0740\ln X_4$... (1)

$Y = 0.610 X_1^{0.419} X_2^{0.362} X_3^{0.177} X_4^{0.0740}$....(2)

Note that the arithmetic average of the resources included in the production function for broiler projects was as follows: -

- The average amount of forage used ($\overline{X_1}$) = 52.45 tons
- Average number of chicks ($\overline{X_2}$) = 18.70 birds
- The average amount of medicines and vaccines used ($\overline{X_3}$) = 122.79 liters
- Average number of human labor hours ($\overline{X_4}$) = 2810.37 hours
- The sample size was (n = 64).

The total, marginal, average output, and elasticity were calculated for each factor of products in the production function after fixing other factors at their averages, as follows in table 4:

Table 4. The marginal and average product functions and the productive elasticity of the resources used in broiler breeding projects.

Variables	Production function	Marginal product	Average output	Elasticity
Feed quantity (ton) X_1	$Y = 7.426 X_1^{0.419}$	$3.111 X_1^{-0.581}$	$7.426 X_1^{-0.581}$	0.499
Number of chicks / thousand X_2	$Y = 13.518 X_2^{0.362}$	$4.894 X_2^{-0.638}$	$13.517 X_2^{-0.638}$	0.362
Medicines and Vaccines / Vial X_3	$Y = 16.655 X_3^{0.177}$	$2.948 X_3^{-0.823}$	$16.655 X_3^{-0.823}$	0.177
Number of human labor hours/hour X_4	$Y = 21.684 X_4^{0.074}$	$1.605 X_4^{-0.926}$	$21.684 X_4^{-0.926}$	0.074

Source: Calculated by researchers.

It is obvious from the table that all variables (the quantity of the feed, the number of chicks, the number of medicines and vaccines, and the human work) are used in the second stage (the economic production stage) as long as the marginal product is decreasing and less than the decreasing average production is the other. That is to say, the relative change in production is less than the relative change in any element of production.

3.3 Estimation of risk functions for broiler projects for the research sample:

The method of least squares (OLS) was used within the statistical program (Eviews12) to estimate the risk functions as shown in the following table 5:

Table5. Risk functions for broiler breeding projects for the research sample

Dependent Variable: LEI2
Method: Least Squares
Date: 09/04/22 Time: 11:17
Sample: 1 64
Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.482855	3.223574	2.011077	0.0491
LX1	-0.570006	0.182310	-3.126584	0.0046
LX2	0.498668	0.131596	3.789386	0.0061
LX3	-0.497535	0.116438	-4.272961	0.0008
LX4	0.469202	0.569991	0.823174	0.4138
D1	-0.040381	0.014924	-2.705776	0.0494
D2	0.252417	0.230742	1.093936	0.2786

R-squared	0.767714	Mean dependent var	5.230963
Adjusted R-squared	0.802041	S.D. dependent var	2.001116
S.E. of regression	2.021434	Akaike info criterion	4.348410
Sum squared resid	232.9132	Schwarz criterion	4.584538
Log likelihood	-132.1491	Hannan-Quinn criter.	4.441433
F-statistic	78.99757	Durbin-Watson stat	1.906866
Prob(F-statistic)	0.000000		

Source: From the researcher's work based on the statistical program Eviews.12.

In light of the estimation of the production risk function of broiler breeding projects (table), it is clear that the most important production inputs affecting the production risk are (the quantity of feed, the number of chicks, medicines, and vaccines, and the number of human working hours). The function included qualitative variables, namely (experience and educational years). The statistical tests proved the statistical significance of these inputs at the level of 5%. The only exception was the number of human working hours and the years of education, and the F-test proved the significance of the function as a whole at the level of 1%, while the adjusted coefficient of determination showed that (76%) of the changes were caused by the change in the factors included in the model and that (24%) of those changes are due to other factors that were not included in the model, such as environmental and climatic conditions, the effect of which was absorbed by the fortuitous element.

The results indicated that there is an inverse relationship between the amount of feed and production risks at a significant level of 5%, and the negative relationship indicates that an increase in the feed by 1%, while other factors remain constant, leads to a decrease in production risks by 0.570%. This could be attributed to the breeder's behavior to avoid diseases of nutritional deficiency such as vitamin A, B, and others, which lead to widespread deaths among chicks and thus increase the risk. The results of the analysis also showed that there is a positive and significant relationship at a level of 5% between the amount of production and production risks, implying that an increase in the number of chicks by 1% while other factors remain constant leads to increasing production risks by (0.577%). It is a matter of fact that the increase in the number of chicks at the expense of the area leads to excessive density and thus increased humidity and lack of ventilation, so the broiler breeders in the research sample make full use of the field space and put chicks corresponding to the size of the farm to avoid mortalities and to ensure the planned production level. The results also indicated that the number of medicines and vaccines had a negative impact on the risk function which amounted to re (0.497) and significance at the level of 1%. Treating of diseased broiler chickens in quantities commensurate with the numbers in the field reduces the impact of the risks resulting from infectious diseases. Furthermore, the use of vaccines avoids chickens from getting infectious diseases, which is the main reason for the increase in the percentage of mortality rate in these projects. As for the labor resource, it has a positive effect on the production risk. However, its significance has not been proven.

The results of the production risk function for broiler breeding projects showed that the years of experience had a negative impact on the production risk, as it amounted to (0.043), as the increase in the experience of the breeders increases their acceptance of adopting modern practices and technology. Furthermore, increase experience is associated with effective administration through using appropriate numbers of chickens at the appropriate time for breeding and providing the chicks need of electricity, water, and other breeding conditions. Thus reducing the risks of production, and it appeared significant at the level of 5%. As for the qualitative variable (years of education), it was not significant in the production risk function, which means that the educational level of breeders does not affect the production risks. It is impaction on the risk was positive, that is, an increase in education years will increase the risk. It is supposed that the risk is reduced with an increased educational level. However, perhaps due to the fact that the higher educational level makes the breeders leave work in poultry breeding projects and look for a higher rank in work outside the farm. Furthermore, poultry production requires experience more than education.

3.4 Analysis of the behavior of breeders against production risks for broiler breeding projects for the research sample.

In order to analyze the behavior of breeders against production risks and classify them into the risk categories (risk preferred, natural risk, and risk-averse), the formula for the risk aversion criterion (Ks) was applied. It was calculated according to the following relationship (Moscardi & Janvry, 1977):

Table 6: Standard coefficient of variation for broiler breeders in Baghdad governorate

Eviction capacity (thousand chicks)	number of projects	Variation coefficient%
1-15	33	46.53
15.1 -30	20	34
more than 30	11	21.94

Source: compiled and calculated by the researcher based on the questionnaire form

Table…. Illustrates the results of the $K_{(s)}$ criterion. Breeders preferring risk was 90.6%, and the percentage of breeders who preferred medium risk was 9.4%, while there were no breeders who avoided risks. Thus, the largest proportion of breeders prefers risk and the average value of the risk parameter Ks for the category of breeders preferring risk was (0.239) and for the category of breeders preferring medium risk was (0.421).

Table:7 Behavior of broiler breeders towards risks, research sample

Risk type	number of projects	%	Average Value $K_{(s)}$
Prefer risks $0 < K_{(s)} < 0.4$	58	90.6%	0.239
< <1.2 Medium risk 0.4 $K_{(s)}$	6	9.4%	0.421
Avoid risk $1.2 < K_{(s)} < 2$	0	0	0
Total	64	100	

Source: compiled and calculated by the researcher based on the questionnaire form.

4. CONCLUSIONS AND RECOMMENDATIONS

In light of the current results, it was found from the production function of broiler breeding projects that the total elasticity value amounted to (1.033), which is greater than the correct one. This implies that there are increasing capacity returns. Thus, an increase in the use of resources will lead to an increase in production at increasing rates. Therefore, the breeders of these projects are produced within the first productive stage of the law of diminishing returns. Calculating the efficiency of the resources included in the broiler production function indicates that broiler breeder projects in the study area were efficient in the use of feed, the number of chicks, and human work, as the ratio of resource efficiency was close to the correct one, while they were inefficient in the use of medicines and vaccines, may be due to the use of cheap commercial medicines and treatments in treating disease. The results of the (Ks) criterion for analyzing product behavior towards risk showed that the percentage of breeders who preferred risk was (90.6%), the percentage of breeders who preferred medium risk (was 9.4%), and none of the included breeders entirely avoid risk. Thus, the largest percentage of breeders prefer to take risks. The researcher recommends for adequate government support to the owners of broiler breeding projects by providing loans and financial advances, as well as meeting the needs of these projects for production requirements, especially chicks, vaccines, energy fuel, and feed at subsidized prices.

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