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Data Envelopment Analysis of Broiler Farm Efficiency in Karbala, Iraq (2022)"

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ABSTRACT

The poultry sector is witnessing an increase in the costs of production elements that enter into the production process, which reflects negatively on the profits of workers in this important and vital sector. Therefore, it requires the use of these elements with high technical efficiency and their allocation in a way that achieves economic efficiency. This can be achieved by attaining both technical efficiency and allocative efficiency, and from here came the goal. The research included studying the technical, allocative and economic efficiency of broiler chicken breeding projects using the data envelope method based on cross-sectional data, which is one of the most accurate and appropriate quantitative methods as compared to other traditional methods and methods used in measuring production and economic efficiency. These methods requires providing data on the quantity of production elements and the quantity of production, as well as Price information. Measuring efficiency contributes to determining the optimal amount of economic resources and thus neutralizing the amount of waste and deficit in their use. In addition to showing the waste in the amount of available production elements and showing the extent of broiler chicken owners' keenness to approach breeding projects or move away from the optimal or marginal production available and renew the percentage available to improve it. This study included 58 projects for raising broiler chickens in Karbala Governorate for the year 2022, and data was obtained from these projects through farm records for those projects. The results showed that the projects achieved a percentage of technical efficiency of 0.92 and 0.88 according to the returns on variable and fixed capabilities, respectively, and the projects formed which achieved full efficiency ratios of 1.7 and 8.6, while capacity efficiency reached 0.96 and 88% of projects were subject to ratios of 1.7 and 8.6 increased energy yield as for the allocative efficiency, it was 0.91, while the economic efficiency was 0.76. The waste in using fodder was calculated at about 300 grams per bird. The waste in using workers per field was 2 workers, and the waste in using vaccines was about 62 dinars per bird. The waste in using services was (Water - electricity - gas - fuel (about 154 dinars per bird. The researcher recommended the need to reduce waste in production elements and use them in a way that achieves economic efficiency, which includes both technical and allocative efficiency, as well as supporting breeding projects by supporting feed, medicines and vaccines to reduce costs and the need for Veterinarians and agricultural engineers to supervise the breeding fields.

تحليل مغلف البيانات لكفاءة مشاريع تربية دجاج اللحم في كربلاء، العراق "(2022)

عيسى سوادي الحجامي ، حيدر حميد بلاو وصادق هادي حسين

الخلاصة

يشهد قطاع الدواجن ارتفاع في تكاليف عناصر الانتاج التي تدخل في عملية الانتاج والذي ينعكس سلبا على ارباح العاملين في هذا القطاع المهم والحيوي لذا يتطلب استخدام تلك العناصر بكفاءة فنية عالية وتخصيصها بشكل يحقق الكفاءة الاقتصادية التي تتحقق بتحقيق كل من الكفاءة الفنية والكفاءة التخصيصية ومن هنا جاء الهدف من البحث دراسة الكفاءة الفنية والتخصيصية والاقتصادية لمشاريع تربية الدجاج اللاحم باستخدام طريقة غلاف البيانات المبنية على البيانات المقطعية والتي تعد إحدى الطرق الكمية الأدق والأنسب مقارنة بالطرق والأساليب التقليدية الأخرى المستخدمة في قياس الكفاءة الإنتاجية والاقتصادية، مما يتطلب توفير بيانات عن كمية عناصر الإنتاج وكمية الإنتاج ، وكذلك معلومات عن الأسعار. يساهم قياس الكفاءة في تحديد كمية الموارد الاقتصادية بالشكل الأمثل وبالتالي تحييد كمية الهدر والعجز في استخدامها بالإضافة إلى بيان الهدر في كمية عناصر الإنتاج المتاحة وبيان مدى حرص أصحاب دجاج التسمين على - اقتراب مشاريع التربية أو الابتعاد عن الإنتاج الأمثل أو الحدي المتاح وتجديد النسبة المتاحة لتحسينه.، وشملت الدراسة 58 مشروعاً لتربية الدجاج اللاحم في محافظة كربلاء لعام 2022 وتم الحصول على البيانات من هذه المشاريع عن طريق السجلات المزرعية لتلك المشاريع، وأظهرت النتائج أن المشاريع حققت نسبة وبلغت الكفاءة الفنية 0.92 و0.88 وفق عوائد القدرات المتغيرة والثابتة على التوالي، وشكلت المشاريع التي حققت الكفاءة الكاملة نسبة 1.7 و8.6، أما كفاءة القدرات فقد بلغت 0.96، وخضعت 88% من المشاريع إلى نسبة 1.7 و8.6. زيادة عائد الطاقة بالنسبة للكفاءة التخصيصية بلغت 0.91، بينما بلغت الكفاءة الاقتصادية 0.76، كما تم حساب الهدر في استخدام العلف بنحو 300 غرام للطائر الواحد كما وبلغ الهدر في استخدام العمال للحقل الواحد 2 عامل وسجل الهدر في استخدام اللقاحات نحو 62 دينار للطائر الواحد وبلغ الهدر في استخدام الخدمات (ماء –كهرباء – غاز – وقود) نحو 154 دينار للطائر الواحد ، وأوصى الباحث بضرورة التقليل من الهدر في عناصر الانتاج واستخدامها بشكل يحقق الكفاءة الاقتصادية التي تشمل كل من الكفاءة الفنية والتخصيصية فضلا عن دعم مشاريع التربية من خلال دعم الأعلاف والأدوية واللقاحات لتقليل التكاليف والحاجة إلى أطباء بيطريين ومهندسين زراعيين للإشراف على حقول التربية .

كلمات مفتاحية : دجاج لحم ، التحليل الحدودي العشوائي ، إقتصاديات الإنتاج

INTROUCTION

The poultry industry is one of the basic pillars in achieving food security policy, as it is a major source of protein and a good source of fats and vitamins with high nutritional value for humans, as well as one of the quickest ways to increase protein supplies in the short term (Rahji etal., 2010). Poultry has become one of the most important sources of meat consumed in the world (Watt, 2010). Chicken meat consumption is a vital source of animal protein needed to meet daily protein requirements (Kwadzo et al., 2013).

Poultry meat is characterized by its high nutritional value, low prices, and high food conversion factor compared to red meat. It is also characterized by quick capital recovery, high returns, and poultry projects do not require a large area of land. The poultry sector is the most expanded, with the entry of large national investments in response to the increasing demand for poultry products resulting from population and economic growth, improved standards of living, and the expansion of consumer food culture (Al-Hashami et al., 2022). Due to the use of modern, high-intensity technology, the poultry sector has become called the poultry industry, which is based on the combined efforts of researchers in the fields of nutrition, physiology, pathology, marketing, and production economics. The main axis in it is management, and thus the efficiency of management in the success of the production process. Iraq has achieved an abundance of... Local production, so the Iraqi government took a decision to stop importing since 2019 to limit losses, as chicken prices are low compared to it. As for local chicken, there are still large quantities of illegal entry, as the number of chicken projects is meat (live) chickens has 4,828 projects in Iraq, including 2,403 actual production projects, while the number of suspended projects has reached 2,353 projects, and there are 105 projects in Karbala Governorate.

The number of chickens sold reached 78,535 thousand chickens, including 15,309 chickens in Karbala Governorate, constituting 19.49% of the total chicken production. Iraq's average production of meat (live) chickens reached 156,549 tons, including 27,265 tons in Karbala (Central Bureau of Statistics, 2021).The main problem is the decline in production and economic efficiency as a result of high breeding costs, fluctuating production prices, and high mortality rates, which negatively affected the efficiency of the resources used, while the data envelopment method is considered one of the most appropriate quantitative methods in this regard compared to other traditional methods and methods used in measuring productive and economic efficiency, which It requires providing data on the quantity of production factors and the quantity of production, as well as information on prices. Measuring efficiency contributes to determining the optimal amount of economic resources and thus neutralizing the amount of waste in their use, in addition to showing the extent to which broiler chicken owners are keen on - breeding projects approaching or moving away from the optimal or marginal production available and renewing the available percentage to improve it. The study aimed to measure the efficiency of poultry production projects in Karbala Governorate.

MATERIAL AND METHODS

The research relied on the output-oriented data envelope method to estimate the technical efficiency of broiler breeding projects, and based on the data of a random sample of broiler breeding projects in Karbala consisting of 58 projects, as well as the use of the input-oriented data envelope to estimate cost efficiency in addition to some economic indicators.

Research importance

The importance of the research stems from the importance of broiler chicken production projects, as producers seek to increase their production to achieve economic efficiency and optimal exploitation of resources. This standard is one of the important standards for achieving economic efficiency using the data encapsulation method, which is considered one of the most important.

Research problem

Many broiler producers in Karbala Governorate suffer from many production obstacles, including high prices for production elements such as feed, labor, vaccines, and medicines, and fluctuating production prices, and high mortality rates which requires optimal use of these

resources and work to increase production by raising the level of efficiency, which contributes to reducing costs.

Research aims

Depending on the research problem, the research objectives were determined:

1- Estimating the technical, allocative and economic efficiency of broiler chicken production projects in Karbala.

2- Identifying efficient projects and calculating the amount of waste in the use of production elements and their deviation from optimal use.

Research hypothesis

The study assumes that broiler chicken production projects do not use production elements with technical and specialized efficiency, and thus economic efficiency is not achieved and there is waste in the use of these elements.

Technical competence:

It means the ability of the farm to use the optimal mix of productive elements to obtain the largest amount of production (Al-Hachamiy and Frhan, 2015) or the ability to reduce the amount of inputs to the level of production and reflect the ability of the farmer to obtain the maximum energy from the set of inputs (Hamad and Shabib, 2024) or the minimum amount of use of production factors, and the efficiency of the farm and how to measure it is an important goal for the development of agriculture (Parikh and Mirkalan, 1995). The value of technical competence lies between zero and one and is inversely related to the level of technical inefficiency , when the technical efficiency is equal to the correct one, this means that the farm produces on the limits of possible production or the optimal use of production elements to obtain the level of production and that it is technically efficient, the unit that is produced at the level of the upper limits is characterized by being technically efficient (Hamdoun Ali.2022). Production maxima are the highest levels of output that can be achieved from given amounts of inputs, the concept of technical efficiency of the resources used in agricultural production involves avoiding economic losses in the use of these resources without obtaining the desired satisfaction from them (Al-Hadheq etal., 2010).

Allocative Efficiency:

It means the ability of the farm to make optimal use of the production elements with the availability of information on prices and available technology, and indicates the achievement of

the minimum cost for the level of production (Al-Hachamiy and Al-Ukeili, 2014), means the farm's ability to optimally allocate economic resources and achieve allocative efficiency when the farm is able to equate the value of marginal product with marginal costs (Alaa M.Abdullah. 2019)

Economic Efficiency:

Economic efficiency is defined as the use of production resources in such a way that it is possible to achieve more production at previous production costs, or achieve previous production at lower costs (Al-Husseini, 1999). Economic efficiency is achieved through the employment of productive resources under the best alternative uses, and economic efficiency refers to the combined effect as a result of achieving both technical efficiency and allocative efficiency, refers to the mobilization of production elements in the best proportions that achieve the most amount of agricultural output at a certain amount of costs*. Economic efficiency can be expressed in the inverse of the ratio of average costs to the minimum average costs (Alzobaee and.Al-Samurai. 2024).

Data Envelopment Analysis (DEA) Data Envelopment Analysis:

A method that uses the linear programming method to determine the optimal combination of a set of inputs and a set of outputs for administrative units with similar objectives, based on the actual performance of these units (Baharmoz, 1996). In essence, it depends on Pareto optimization, which states that any decision-making unit is inefficient if another unit or combination of units can produce the same amount of output with less quantity or inputs, the production unit has Pareto efficiency, as it achieves the opposite (Al-Shuaibi, 2004). It is a model for solving the issue of maximizing output or minimizing inputs. An envelope or a field containing the data is created so that the efficiency of the different farms can be estimated according to the combination of resources used in this field (the envelope). The change in return to capacity (VRS) is any increase in production elements that results in an increase in a different percentage (more or less) in production. The results of the Variation Return-to-capacity (VRS) analysis show the results of both the stability and the variation of return-to-capacity, allowing the estimation of the Technical Efficiency (TE) and Capacity Efficiency (SE).

Scale Efficiency:

Scale, which is the change in production when all the inputs in production change, and it means the extent that the project can benefit from by returning to the optimal capacity, and it is

calculated by dividing the efficiency of the CCR model by the BBC model (Abbott and Doucouliagos, 2003).

$$Se_i = \frac{TE_i^{CRS}}{TE_i^{VRS}}$$

If the capacity efficiency SE=1, it reflects the efficiency in capacity and means the project is efficient on a large scale, meaning that the inputs and outputs are effective under CRS and VRS, whereas, if the capacity efficiency is (1>SE), it means that the full capacity efficiency of the production unit is not reached, that is, there is a difference between the technical efficiency in light of the change in the capacity return and the stability of the capacity return, that is, the border production differs from the optimal production. The optimal amount of input used differs from the actual amount of input, to determine the decrease, increase or stability of the return on capacity, the curve represents the possible production curve and it represents the three cases of constant, decreasing and increasing returns to scale. Capacity efficiency is measured through VRS and CRS and to determine the three cases of capacity return (increasing, decreasing and constant). A third model becomes, which is the non-increasing capacity economics model, NIRS, so if they are equal to CRS. The resolution unit is described by diminishing returns to capacity. If they are equal to VRS, the unit resolution is described by increasing returns to capacity, but if they are equal to CRS and VRS, then the decision unit is described by the stability of amplitude returns (Coelli, 2005).

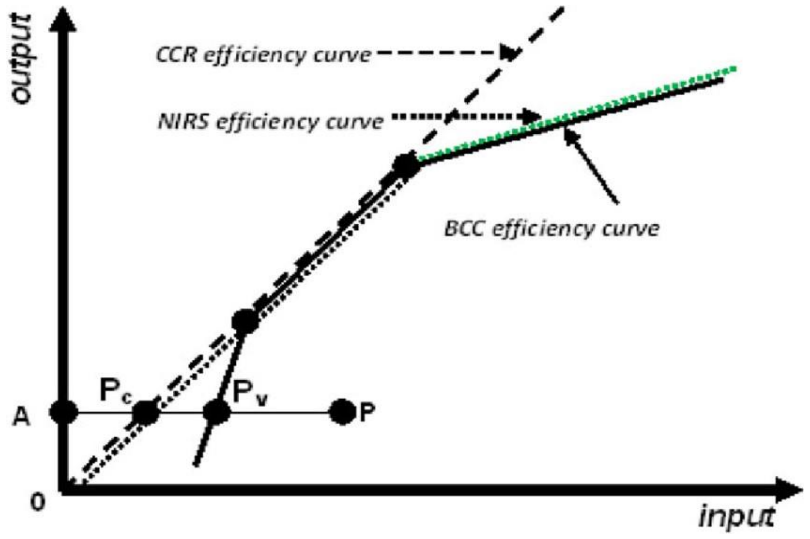

Figure 1. Scale Efficiency

Description λXNΘY of the models used in the study:

The output-oriented data envelope analysis model: The technical efficiency of the farm using the output model is defined as the proportional increase in production with constant input amounts at a certain level in this model.

$\mathrm{M}a\mathrm{X}_{\theta}\ \lambda\theta$

Subject to:

$-\theta\,\gamma_{\iota}\ +\gamma\lambda\geq \mathrm{O}$

$\mathrm{X}_{\iota}\ -\mathrm{X}\lambda\geq \mathrm{O}$

$N\,\lambda\ =1$

$\lambda\geq 0$

Where: &≤ θ ≤1, 1- θ represents the proportional increase in production y that farm i can achieve without increasing the use of the quantity of inputs (xi).

Data envelope analysis model with input guidance: The technical efficiency of the farm using the input model is defined as the low ratio of production elements to obtain at a certain level of production.

$\mathrm{M}in_{\Theta\lambda}\ \theta^{VRS}$

Subject to:

$-yi+Y\lambda\geq 0$

$\mathrm{X}_{i}\ -X\lambda\geq 0\theta$

$N\lambda=1$

$\lambda\geq 0$

To measure economic efficiency, it is necessary to have information about input prices. When the goal is to reduce the amount of inputs used, economic efficiency can be reached by solving the following linear programming issue (Fare and Norris, 1994).

$Min\lambda x_i * w * x_i$ …….. 2

Subject to:

$Xi-X\lambda\geq 0$

$X_i-X\lambda\geq 0\theta$

$\lambda\geq 0$

where xi = cost reduction vector for farm number i, given that input prices Wi and production rate Y are given.

Cost efficiency is calculated as the ratio of the lowest level of costs to the actual level of costs.

$CE = \theta */\theta$

Thus, the economic and allocative efficiency can be calculated as follows:

$EE = 1/CE$ and $EE = AE * TE$

RESULTS AND DISSCUSION

Table (1) shows the average production quantities and production factors used in the production of broiler projects, and through it it is clear that the average production per project of broiler chickens reached about 39.866 tons, while the amount of inputs used in the production process was 1.19, which is the number of birds. It was in the range of (3,000-200,000) birds, with an average of 21,732 birds. As for the amount of feed, it ranged between (9-600) tons, with an average of 64,495 tons, while the average of the third production component, represented by the number of employed workers, was about 4 workers. With regard to the amount spent on medicines Vaccines amounted to around (12350-370) thousand dinars, while the amount spent on services (electricity, water, fuel and gas) was an average of 4508 thousand dinars.

Table (1): The descriptive analysis of the study variables.

The details		N	Minimum	Maximum	Mean	Std. Deviation
	x1	58	3000	200000	21732.76	29565.6
	x2	58	9	600	64.4951	87.754
IN put	**x3**	58	1	50	4.1515	6.3904
	x4	58	370	12350	1735.846	1760.152
	x5	58	500	65000	4508.493	8519.17
Out put		58	4.64	368	39.8661	54.08611

Source: Prepared by the researcher based on the data of the study.

Using the technical competency model that was described in the theoretical framework, which includes the explanatory variables of the production function shown in Table 3, namely (the number of chicks, the amount of feed, the number of workers, and the cost of medicines and vaccines), adopting the method of analyzing the output-directed data envelope, and in light of the change in capacity returns, the results of the efficiency estimates were obtained using the Deap

statistical program, by reviewing the results, it is clear that the broiler breeding projects that achieved full technical efficiency in light of the constant capacity return were (5) while they were (16) projects under the variable capacity return. This means that only 5 projects whose border production was equal to their optimal production, so the projects that achieved full capacity efficiency were 5 projects, as for the other projects, they took different percentages, and in the general average of the study broiler breeding projects, the technical efficiency was (0.92 and 0.88) in light of the stability and change of the capacity return, and the largest percentage of the projects achieved efficiency exceeding (0.9) in light of the change and stability of the capacity return, respectively. It means that the research sample projects can increase their production by (0.8 and 0.12), respectively, or in other words, the actual production deviates or is less in the same proportion than the optimal production that can be achieved if the resources are used optimally by the broiler breeding projects, and this deficit is due to the lack of efficiency. As for the capacity efficiency, which indicates that the percentage of input utilization was around (0.96). The results of the analysis of technical efficiency and in light of the change in capacity returns indicate that the number of broiler breeding projects operating in the stage of increasing capacity returns was (51) projects, which constituted 88% of the research sample projects. This means that the increase in the quantities of production elements leads to an increase in production that exceeds the increase achieved by the quantities of production elements that preceded it. (2) Project. This means that increasing the used quantities of production elements leads to an increase in production, but it is less than the increase achieved by the used quantities that preceded the increase, and in the end the increase fades away, so it is better not to increase the used quantities of production elements. As for the number of meat chicken breeding projects that were in The stage of stabilizing capacity returns (5 projects), which means that the increase in production elements is proportional to the increase in production.

As for the inability to maximize production, the projects of the research sample achieved actual production of about (37.636) tons and in light of the weights of the chickens that were sold, they are equal to (19554) chickens, while the production achieved efficiency was about (39.866) tons and in light of the weights of the chickens that were sold It is equal to (20709.65) chickens, and thus the deficit was estimated at about (2.229) tons, which equals (1194) chickens. The reason for this is due to the high mortality rate, which amounted to an average of 8%.

Returning to the study evidence, we find that the degree of efficiency is reverse with the mortality rate in birds.

Table (2): results of efficiency analysis.

Efficiency	N	Minimum	Maximum	Mean	Std. Deviation
Technical efficiency from CRS	58	0.59	1	0.8837	0.08647
Technical efficiency from VRS	58	0.63	1	0.92	0.08376
Scale Efficiency	58	0.81	1	0.9608	0.03626

Source: prepared by the researcher based on the study data and the results of the efficiency analysis.

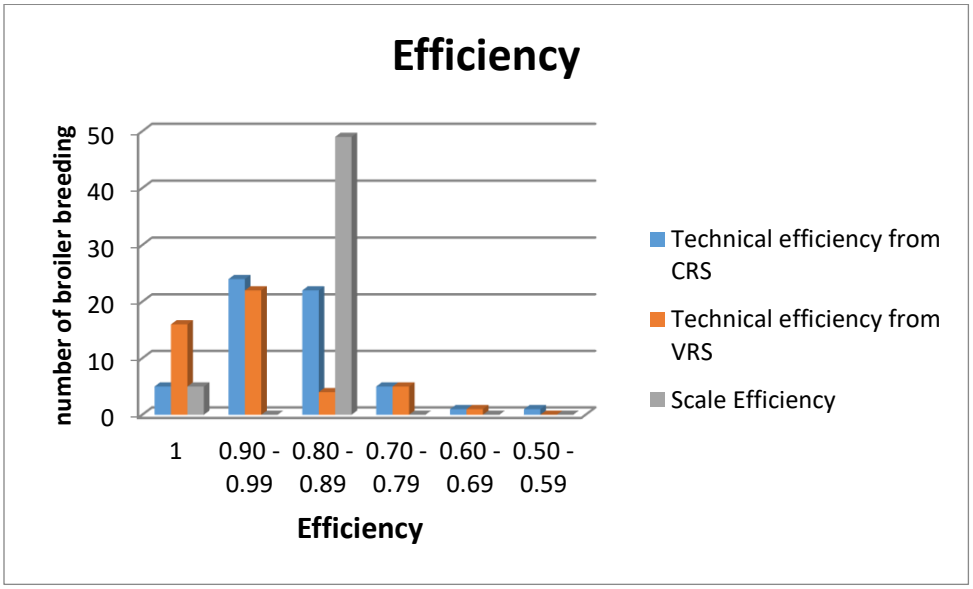

Figure (2): A flowchart of the technical efficiency of broiler breeding projects.

The results indicated that there is a variation in the level of technical efficiency (TE) at both the fixed (CRS) and the variable (VRS) levels, and capacity efficiency in the study sample according to the actual field capacity of breeding chickens, as in Table (3), as it was found that there was a direct proportion between field capacity and efficiency, as the capacity exceeded The third (greater than 20,000) birds of other capacities in the ratio of technical efficiency according to fixed and variable capacity returns as well as capacity efficiency, and this indicates that

poultry breeders who own large-capacity projects have the ability to provide technology and have a positive impact on efficiency Al-Hijami 2018) and small projects (less than 10,000) birds were less efficient and therefore needed to improve their capabilities, improving the efficiency of their partners by 16%.

Table (3): Results of efficiency analysis by capacity.

The details	Capacity	N	Minimum	Maximum	Mean	Std. Deviation
Technical efficiency from CRS	000-100003	27	0.59	1	0.8462	0.09503
	10000-20000	14	0.81	0.99	0.9041	0.05324
	210000≥	17	0.76	1	0.9266	0.0705
Technical efficiency from VRS	000-100003	27	0.63	1	0.9056	0.10318
	10000-20000	14	0.85	1	0.9289	0.05209
	210000≥	17	0.78	1	0.9355	0.06939
Scale Efficiency	000-100003	27	0.81	1	0.9356	0.03726
	10000-20000	14	0.94	0.99	0.9734	0.01513
	210000≥	17	0.96	1	0.9904	0.01008

Source: prepared by the researcher based on the study data and the results of the efficiency analysis.

The economic efficiency and its technical and allocative efficiency for broiler breeding projects in the research sample were estimated using the data envelope method in terms of inputs according to the principle of reducing the amount of inputs to the level of their prices in light of the amount of resources used and their prices included (the price of one-day-old birds, feed purchase prices, workers' wages, drug costs Vaccines are at the bird level, and service costs (water, electricity, gas, and fuel) are at the bird level, assuming a change in capacity revenues, as shown below: By reviewing the results, it is clear that the number of broiler breeding projects that achieved full technical efficiency according to the cost function method was (11) projects, while the rate of technical efficiency according to the cost function method was 0.84, and this means that the amount of production inputs used can be reduced by 16% to obtain the same production, i.e. The amount of waste in production inputs increased by 16%.

It was estimated in the light of the prices of the resources used, it was (0.91), and this means that the redistribution of the economic resources used will provide 9% of them, meaning

that there is a waste of the resources used by 9%, and that broiler breeding projects can obtain the same output by using 91% of those resources and thus The broiler breeding projects can reach the optimum production point, which is the point of contact between the isoquant curve and the cost line, as production maximization is achieved when the slope of the isoquant curve (marginal rate of substitution) and the slope of the isoquant curve (the price ratio) are equal. These production costs exceed the lowest point of the average costs on the average costs curve by the equivalent of 9%, and the project that achieved the lowest level of allocative efficiency (0.59) has to reduce the amount of its inputs by 41% to achieve optimal allocative efficiency and access to the best use of the economic resources used, and this means That in the quantities used of economic resources a great waste and the results of the analysis show that the number of projects breeding chicken meat that achieved full allocative efficiency was (3) projects of the form 5% of the number of research projects.

Through the results of the analysis, it was found that the number of broiler breeding projects that achieved full cost efficiency were (3) projects, and that the minimum cost efficiency was (0.41) and the average was (0.76). This means that broiler breeding projects can achieve the same level of production under Reducing the reduction of the amount of resources used by 34%. It is noted that the number of broiler breeding projects that achieved full technical efficiency was (11) projects, meaning that their production falls on the equal output curve, and that (8) projects of them were inefficient from a allocative point of view, and (3) projects only It was technically and allocatively efficient and therefore economically efficient, which constituted 0.5% of the number of broiler breeding projects. The results of the analysis indicate that the number of broiler breeding projects that achieved economic efficiency (0.9-0.09) were (8) projects that constituted 13.6% of the total. These are projects, while the projects that achieved economic efficiency (0.8-0.89) were (15) projects that constituted 25.8% of those projects, while those that achieved economic efficiency (0.7-0.79) were (14) projects that constituted 24% of those projects. While (4) projects achieved economic efficiency (<0.60) and constituted 6.8% of the number of mothers Chicken farming projects (Coelli, 1996; Al-Hachamiy etal., 2018).

Table (4): results of the economic efficiency analysis.

Efficiency	N	Minimum	Maximum	Mean	Std. Deviation
Technical	59	0.55	1	0.8378	0.12456
Allocative	59	0.59	1	0.9104	0.0939
Cost	59	0.41	1	0.7589	0.11732

Source: prepared by the researcher based on the study data and the results of the efficiency analysis.

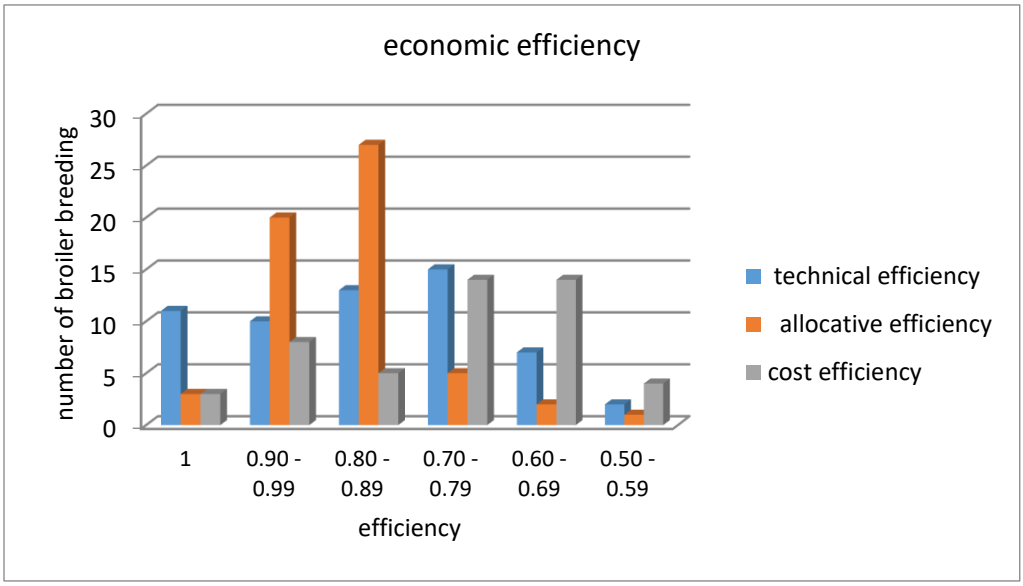

Figure (3): A diagram of economic efficiency and its components.

Table (5) shows the quantity of production elements that achieve economic efficiency and were transferred at the level of one bird. As in Table (6), the following is shown:Number of birds: The average number of birds included in the projects was (21733) birds, while the numbers achieved for efficiency were (17825) birds, and thus the wastage is about (3908) birds due to the deaths that occur during breeding. Amount of fodder used: The amount of fodder was estimated at about (37.636) tons at the level of the study projects, so the actual consumption of one bird is 3 kg, while the amount achieved for economic efficiency is 2.7 kg, so the waste is 0.3 kg.

Workers: The number of workers working in one field was up to (5) workers, while the number of workers achieving economic efficiency was up to (3) workers for one field, and thus the waste in operating the porter reached up to two workers. Medicines and Vaccines: The

amounts spent on actual vaccines and medicines amounted to (101) dinars per bird, while the amount achieved for economic efficiency was about (39) dinars per bird. Services: The actual amounts spent on services (water, electricity, gas and fuel) are about (270) dinars per bird, while the amount achieved for economic efficiency is about (116) dinars per bird.

Table (5): The descriptive analysis of the study variables that achieve economic efficiency.

The details	N	Minimum	Maximum	Mean	Std. Deviation
x1	58	3000	200000	17824.76	28391.34
x2	58	9	600	53.4743	85.17404
x3	58	1	50	2.8838	6.43388
x4	58	370	12350	851.1254	1575.984
x5	58	500	65000	4508.493	8519.17

Table (6): Actual and achieved amount of economic efficiency.

The details	X1	X2	X3	X4	X5
The amount of the actual resource used	21733	2.967	5	101	270
The amount of resource used that achieves efficiency	17824	2.5	3	39	154
Growling	3908	0.5	2	62	116

Source: prepared by the researcher based on the study data and the results of the efficiency analysis.

CONCLUSION

The actual production in broiler breeding projects deviates from the optimal production by (8-12) %, and it is possible to increase their production to reach the optimal production, and that projects operate in the stage of increasing capacity returns, and the rate is (59)% of those projects, and the percentage of exploitation of inputs was about 90 %. There is a direct proportion between field capacity and technical efficiency. Broiler breeding projects can achieve the same level of production according to the cost function method while reducing the amount of resources used by (24%) and thus reducing costs. It is possible to redistribute the economic resources used and save 9% to achieve price efficiency and improve cost efficiency by 24%.

Supervision of veterinarians and agricultural engineers on breeding fields or the introduction of breeders, especially owners of small projects, in courses for the purpose of improving their

management of projects and thus increasing efficiency. Supporting breeding projects by subsidizing fodder, medicines and vaccines to reduce costs due to the high costs of breeding

CONFLICT OF INTEREST

The authors declare no conflicts of interest associated with this manuscript.

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