

An Economic Study of the Factors Affecting the Efficiency of Broiler Marketing in Baghdad Governorate for the Year 2024

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ABSTRACT

The objective of this research is to study the reality of marketing chicken meat products and the marketing institutions specialized in this field, as well as to study the marketing efficiency of products within marketing channels. Research problem concentrated on the fact that broiler marketing suffers from many problems, including the weak efficiency of most marketing services and functions, including transportation, grading, packaging, distribution, and storage, in addition to the high margins and marketing costs compared to the efficiency of marketing services, which requires further study and research. This reflects potential challenges in managing distribution or services. The results showed a weak relationship between the number of years of experience and the level of marketing efficiency. Using the Tobit model, the M.L. method, and the 13 Eviews program, the Tobit model was estimated to determine the impact of the most important independent factors (marketed quantity, percentage of loss, sales to non-retailers, type of holding, and handling of imported quantities) on the marketing efficiency of broiler products. The model is used to determine the impact of explanatory factors on marketing efficiency levels. It was found that marketing operations for broiler products play an important role in ensuring that they reach consumers effectively and at reasonable prices. This requires studying the marketing efficiency and its components for meat produced in the private sector. The study recommends improving marketing services for broiler chicken farmers to ensure production stability and marketing efficiency.

Keywords: capacity efficiency, Marketing functions, marketing approach, poultry industry, slaughterhouses.



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INTRODUCTION

The nutritional level of any nation is one of the indicators of its degree of sophistication and civilization, as it reflects a clear picture of the economic and cultural status of society. In recent years, the term food security has emerged, defining a country's ability to provide sufficient food for its citizens through local production and the financial revenues required to import the necessary supplies to ensure a constant supply of food. Poultry products, such as meat and eggs, are among the most important and best sources of animal protein in human nutrition. Poultry is characterized by its high nutritional value, low

cost compared to red meat, and high feed conversion ratio, as supported by the researcher (Ahmed, 2016). Many farmers prefer to invest in this business because of its many benefits and rapid capital turnover (Spencer, 2010). The poultry industry in Iraq first emerged in a modern, intensive manner in the public sector in the late 1960s of last century. During the 1970s, the state established three poultry companies in the north, center, and south to oversee the construction of a large number of advanced and modern projects for the production of table eggs and broiler chickens. The average Arab per capita consumption of poultry meat

is approximately 8 kg/year, compared to 14.1 kg/year in Europe and 35.7 kg/year in the United States. Therefore, there is a significant shortage in the consumption of poultry products (Badra and Eldokla, 2018). Marketing operations for broiler products play an important role in ensuring that they reach consumers in a good manner and at reasonable prices, which requires a study of the marketing efficiency and components of meat produced in the private sector. Marketing of agricultural products is generally closely linked to the production process, to the point that some economists believe that marketing precedes production, justifying this by the need to understand how to manage the product before making a production decision. It addresses everything that happens from the farm gate until the product reaches the final consumer. Marketing operations and functions overlap, thus giving great importance to the study of agricultural product marketing. Therefore, studying marketing efficiency is an important study in terms of the multiple criteria used to measure efficiency. Achieving marketing efficiency is linked to production with good specifications and high productivity, which is reflected in a lower cost per unit of production, which has an impact on measuring efficiency (Kyonigisha and et al, 2018; SPSS, 2019). Therefore, achieving marketing efficiency is achieved by linking production processes that affect the quality of the agricultural product, thus reducing the rates of spoilage and loss during production, with marketing processes, which is reflected in the rates of loss during marketing. Accordingly, agricultural marketing is the primary factor for the continued success of any crop (Sintani and et al, 2010). Consequently, paying attention to this aspect is considered important for the success of the marketing process (Adenuya, 2013). The research problem can be defined as broiler marketing suffering from many problems, including those related to the weak efficiency of most marketing services and functions, including transportation, grading, packaging, distribution, and storage, in addition to the high margins and marketing costs compared to the efficiency of marketing services, which requires further study and research. We

hypothesized that local production was insufficient to meet market demand for poultry meat products (through a study of the reality of poultry meat production and imports (Ali and Faeq, 2019).

MATERIALS AND METHODS

To achieve the research objectives and test its hypotheses, data were obtained from its primary sources represented by the questionnaire form, as 62 forms were collected through personal interviews with wholesale traders in Baghdad Governorate for the year 2024 where the use of mathematical equations to calculate marketing efficiency (Valceschini, 2006; Soterides, 2016). This method of measuring the marketing efficiency of agricultural goods and products is taken from the American marketing literature, where some mathematical or arithmetic equations were found for use on a macro scale, meaning that they are used for the traditional measurement of the efficiency of the prevailing agricultural marketing system in a region or place as a whole for the commodity under study. Here, the marketing costs incurred by the farmer, as well as the intermediaries and the production costs of the agricultural product, are the basis for calculating the percentage of marketing efficiency (Myeki, 2022).

Among these equations (Image and et al, 2020).

1. Marketing efficiency

$$100 - \left\{ \frac{\text{Total marketing and production costs}}{\text{cost Total ts (marketing+productivity)}} \times 100 \right\}$$

2. Marketing efficiency =

$$100 - \left\{ \frac{\text{marketing and production costs}}{\text{value of the marketed commodity (consumer price)}} \times 100 \right\}$$

3. Marketing efficiency =

$$100 - \left\{ \frac{\text{Marketing margins}}{\text{Marketing margins+Production cost}} \times 100 \right\}$$

RESULTS AND DISCUSSION

First: Some indicators about the reality of raising and producing broiler chickens: It is necessary to review a summary of the importance of raising and producing broiler chickens in Iraq, Baghdad, and the sample in general. Chicken meat is one of the most important animal products containing fatty substances and animal proteins. Recently, its importance has increased in Iraq and various parts of the world due to the expansion

resulting from the trends of high demand for poultry meat and the possibility of raising it in large numbers within specialized fields for this purpose. The nutritional value of poultry meat compared to other animal products The net protein in chicken meat reached (190) g/kg, which is the highest amount of protein in animal products. It is also characterized by a low fat percentage of (0.4%) and high calories, as it is ranked third in animal products, which amounted to (1347) calories/kg. As for the number of projects and the quantities produced, (Table1) shows that the lowest value for the number of broiler projects was in 2007, which amounted to (1196) with a production rate of (40.3) thousand tons. This was due to the increase in imported quantities, which negatively affected local farmers, as well as the spread of diseases and epidemics among poultry, which prompted some breeders to reduce the number of chickens or exit the

project and close it. As for the year 2008, the number of broiler projects increased to (1523) with a production rate of (36.9) thousand tons as a result of the agricultural initiative in 2008 through the major role of the loan fund in supporting the support, which led to an increase in the number of broiler chickens produced. Production continued to fluctuate in increasing over the years until it decreased in each of the years (2013 and 2014) where it reached (74.6) and (69.9) thousand tons respectively due to the entry of terrorism in the country and the events that accompanied this battle, and taking some measures in the years following (2023) with a production rate of (172.3) thousand tons is the ban on imports which led to encouraging breeders and urging them to increase the number of broiler projects and increase the quantities produced(Zanzl and yusuf, 2022).

Table1. Preparing poultry meat projects and production quantities in (1000) tons for the duration (2000-2023)

Years	Number of chicken meat projects	Production rate in
2000	2490	82.5
2001	2822	108.4
2002	2752	122.5
2003	2681	53.2
2004	2000	46.3
2005	1918	59.7
2006	1593	55.6
2007	1196	40.3
2008	1523	36.9
2009	1455	44.1
2010	1644	52.8
2011	1884	87.2
2012	2106	89.8
2013	2091	74.6
2014	1681	69.9
2015	1641	86.5
2016	1643	87.5
2017	1663	96.1
2018	1769	109.4
2019	2032	148.2
2020	2171	156.5
2021	2166	141.4
2022	2631	162.5
2023	2482	172.3
Total	48134	2184.2

Source: Republic of Iraq Ministry of Planning and Development Cooperation Central Organization for Statistics and Information Technology, Statistical Aggregates for the Years (2000-2023).

Second: Estimation of Tobit Model

Before using qualitative response model analysis, the hypotheses for applying these

models were verified. There are two important hypotheses that must be verified before analysis: 1. There is no complete correlation

between the explanatory variables that explain and influence marketing efficiency. If there is a complete correlation, the variable causing this correlation must be removed. The second hypothesis states that there is no correlation between the explanatory variables and random error. The other hypotheses are that there is a significant relationship between the explanatory variables and marketing efficiency. The dependent variable is a qualitative variable, and the variables are measured without errors (AL-wardi and et al, 2024).

Model Description: To describe a mathematical model, seven variables were selected in the estimated model to clarify the nature of the relationship between each of the independent variables and the dependent variable. From these, the most important variables and prior theoretical expectations regarding the signal and the size of their coefficients were identified. These variables are:

Marketing Quantity X1: A quantitative explanatory variable measured in dinars | Ton has a direct relationship with marketing efficiency.

Loss ratio X2: A quantitative explanatory variable, measured as a percentage, and has an inverse relationship with marketing efficiency.

That is, the higher the loss ratio, the lower the marketing efficiency.

Sales to non-retailers X3: A qualitative explanatory variable, taking values (1, 0) (1 if selling to non-retailers, 0 if not selling to non-retailers). Its relationship with marketing efficiency is directly related.

Type of holding X4: A qualitative explanatory variable, taking numbers between (0-1) if 0 owning, and 1 if renting. Its relationship is directly related to marketing efficiency.

Dealing with importers X5: A qualitative explanatory variable, taking numbers between (0-1), where 1 is for dealing with importers and 0 is for dealing with importers. Its relationship is inversely related to marketing efficiency.

Years of experience X6: A quantitative explanatory variable, measured by the number of years, with a positive relationship with marketing efficiency.

Academic achievement X7: Qualitative explanatory variable. Predictions regarding the variable's impact on marketing efficiency are that it has a positive impact on the marketing efficiency ratio. Before delving into the analysis and estimation of the Tobit model, it is necessary to review some of the statistical influences, as in the table below:

Table 2. Number and percentages of the distribution of the studied sample according to the independent factors

Independent factors		No.(62)	Percentage %	chi-square value(x ²)	p-Value	Degrees of freedom (DF)
Sales to non-retailers:x3	1:Yes	27	43.55	1.032=x ² GM	0.309	1
	0:No	35	56.45			
Type of holding:x4	Ownership:1	19	30.65	9.290=x ² **	0.0023	1
	Lease:0	43	69.35			
Dealing with importers:x5	1:Yes	45	72.58	12.64=x ² **	0.0004	1
	0:No	17	27.42			
Experience (years):x6	≤5	14	22.58	13.04=x ² **	0.0015	2
	6-10	34	54.84			
	>10	14	22.58			
	0:Illiterate	4	6.45			
Academic qualifications:x7	1. Primary	6	9.86	9.218=x ² **	0.0074	6
	2. Intermediate	8	12.90			
	3. High school	12	19.35			
	4. Diploma	6	9.68			
	5. Bachelor	16	25.81			
	6. Postgraduate studies	10	16.1th			

** $(P \leq 0.01)$: high moral significant. N.S., Not morally significant

Source: Calculated by the authors using the SPSS program

Statistical analysis of Table (2)

The Chi-square test (X^2) was conducted to analyze the relationship between a set of independent variables and the phenomenon under study, as shown in (Table 2). The analysis yielded the following results:

The test results showed that the probability value ($P = 0.309$) was greater than the significance level (0.05), indicating that there were no statistically significant differences between the variables. Therefore, the type of entity does not have a significant influence on the phenomenon under study. The probability value ($P = 0.0023$), which is less than 0.01, indicates a strong statistically significant relationship between the type of tenure (ownership/rent) and the phenomenon under study. Therefore, the type of tenure represents

a significant factor influencing the phenomenon.

The analysis results showed high statistical significance ($P = 0.0004 > 0.01$), reflecting a strong relationship between dealing with the importer and the extent to which it is affected by the phenomenon under study

The results indicated the presence of statistically significant differences ($P = 0.0015 < 0.01$) between the different categories of years of experience, meaning that the length of experience has a significant influence on the phenomenon.

The analysis showed statistical significance ($P = 0.0074 < 0.01$), indicating that there are significant differences between different levels of educational achievement. Therefore, educational achievement is one of the factors influencing the phenomenon under study.

Table 3 . The relationship between some independent factors and marketing efficiency

Independent factors		Middle SD±	P-value
Sales to non-retailers:x3	1:Yes	0.692±0.18	0.276
	0:No	0.731 ±0.07	
Type of holding:x4	1:Ownership	0.734 ±0.15	0.493
	0: Lease	0.709 ±0.13	
Dealing with importers:x5	1:Yes	0.701 ±0.15	0.313
	0:No	0.750 ±0.07	
Experience (years):x6	5≤	a 0.08± 0.776	*0.050
	10-6	b 0.14± 0.686	
	10>	ab 0.12± 0.721	
Academic qualifications:x7	0:Illiterate	0.747 ±0.04	0.284
	1. Primary	0.705 ±0.09	
	2. Intermediate	0.749 ±0.07	
	3. High school	0.712 ±0.18	
	4. Diploma	0.665 ±0.07	
	5. Bachelor	0.696±0.17	
	6. Postgraduate studies	0.738± 0.06	

*($P \leq 0.05$): moral significance. N.S.. Not morally significant

Source: Calculated by authors using th SPSS program.

(Table 3) shows the results of the statistical analysis to measure the extent of the influence of some independent factors on marketing efficiency. The arithmetic mean and standard deviation (SD) were used for descriptive analysis, in addition to testing statistical significance through the probability value (p-value)The results showed that the arithmetic mean of marketing efficiency among entities dealing with retailers was (0.692 ± 0.18), while it was (0.731 ± 0.07) among entities dealing with non-retailers. The probability value was ($P = 0.276$), which is greater than the significance level (0.05),

indicating that the variable is insignificant and does not significantly affect marketing efficiency.The arithmetic mean of marketing efficiency among those with private ownership was (0.734 ± 0.15), while it was (0.709 ± 0.13) among those living in rental housing. The probability value was ($P = 0.493$), indicating no significant differences between the two categories and indicating that the type of ownership is not a factor influencing efficiency marketing, The average marketing efficiency of those dealing with importers was 0.701 ± 0.15 , compared to (0.750 ± 0.07) for those who did not deal with importers. The

probability value (P) was 0.313, which is also not statistically significant, indicating that dealing with importers does not significantly affect marketing efficiency, The data indicate that the average marketing efficiency varies according to the number of years of experience, reaching (0.776 ± 0.08) for those with less than 5 years, and (0.686 ± 0.14) for those with 6-10 years of experience. As shown in the table, there is statistical significance at the $P < 0.05$ level, indicating that years of experience are an influential factor in marketing efficiency.

Table 4. Correlation coefficient between marketed quantity, loss ratio, and experience with marketing efficiency

Independent variables	Correlation coefficient r with marketing efficiency: Y	P-Value
Marketed quantity:1x	**0.51-	0.0001
Loss ratio:2x	**0.38-	0.0023
Experience :x6	0.10-	0.421
**(P≤0.01): high moral significant. N.S. Not morally significant		

Source: Calculated by authors using the SPSS program

(Table 4) shows a statistically significant negative relationship between both the marketed quantity and the loss ratio and marketing efficiency at a significance level of (0.01). The correlation coefficient between the

marketed quantity and marketing efficiency reached (0.51) with a probability value of ($P = 0.0001$), while the correlation coefficient between the loss ratio and marketing efficiency reached (0.38) with a probability value of ($P = 0.0023$). These results indicate that the higher the marketed quantity or the cash sales ratio, the lower the marketing efficiency, reflecting potential challenges in managing distribution or services. In contrast, experience (X6) did not show a statistically significant relationship with marketing efficiency, with the correlation coefficient reaching (0.10-) with a probability value of ($P = 0.421$), indicating a weak relationship between the number of years of experience and the level of marketing efficiency. The TOBIT model can be estimated to clarify the impact and value of the variables' influence on marketing efficiency (11). The TOBIT model was estimated to clarify the impact of some qualitative factors that affect the level of marketing efficiency of broiler chickens, as it is one of the qualitative response models and is used due to the nature of the dependent variable, i.e. when it is qualitative. The C.T.R.(Conversion to Response) method was used, as the dependent variable was expressed with continuous values between zero and one .

Table 5. Estimation of Model TOBIT

Dependent Variable: Y				
Method: ML - Censored Logistic (Newton-Raphson / Marquardt steps)				
Date: 05/09/25 Time: 23:33				
Sample: 1 62				
Included observations: 62				
Left censoring (indicator) is always zero				
Convergence achieved after 5 iterations				
Coefficient covariance computed using observed Hessian				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.873514	0.039355	22.19598	0.0000
X1	-0.024579	0.003456	-7.112799	0.0000
X2	-2.738781	1.002955	-2.730711	0.0063
X3	0.012323	0.024613	0.500653	0.6166
X4	-0.059101	0.026581	-2.223396	0.0262
X5	-0.057557	0.025833	-2.228048	0.0259
Error Distribution				
SCALE:C(7)	0.049968	0.005376	9.294682	0.0000
Mean dependent var	0.714254	S.D. dependent var	0.134809	
Akaike info criterion	-1.709169	Schwarz criterion	-1.469009	
Log likelihood	59.98424	Hannan-Quinn criter.	-1.614876	
Avg. log likelihood	0.967488			
Left censored obs	0	Right censored obs	0	
Uncensored obs	62	Total obs	62	

Source: Researcher's work based on questionnaire data and using Eviews13 software

From the (**table5**) showing the estimation results of the TOBIT model, the most important variables affecting the marketing efficiency of broiler chickens can be explained as follows:-

Marketing Quantity (1X): A quantitative explanatory variable with a negative sign, indicating an inverse relationship with an increase in the marketing quantity by one dinar, the probability of marketing efficiency decreases by 0.02, holding the rest of the estimated factors in the model constant. The results of the Z-test showed that the explanatory variable is significant at a 1% significance level, meaning it is statistically significant.

Loss Ratio (2X): A quantitative explanatory variable with a negative sign, consistent with economic logic. With an increase in the loss ratio by one unit, the probability of marketing efficiency decreases by 2.73, holding the rest of the estimated factors in the model constant. The results of the Z-test showed that the explanatory variable is significant at a 1% significance level, meaning it is statistically significant.

Sales to non-retailers (3X): A qualitative explanatory variable with a positive sign, consistent with economic and technical logic, explaining the relationship. The direct relationship between the variable and marketing efficiency, i.e. by increasing dealings with non-retailers by one unit. The probability of marketing efficiency increases by 0.012, holding all other factors constant. The Z-test results showed that the explanatory variable is insignificant at a 5% significance level, meaning it has no statistical significance

Type of holding (4X): A qualitative explanatory variable with a negative sign, meaning that if the store is rented, this leads to a decrease in the value of marketing efficiency due to the increase in marketing costs, and the opposite is true when the store is owned.

Dealing with importers (5X): A quantitative explanatory variable with a negative sign, meaning that with an increase in the value of the imported quantities by one unit, the probability of marketing efficiency decreases by 0.057, holding all other estimated factors in the model constant. The Z-test results showed that the explanatory variable is significant at a 5% significance level, meaning it is statistically significant.

Wald statistics test The Wald test was used to test the significance of the parameters of the independent variables for the Tobit model as a whole by testing the null hypothesis, which states that the parameters of the independent variables, s , for the Tobit regression model are equal to zero, as follows: :

$$H_0 = H_1 = H_2 = H_3 = H_4 = H_5$$

(Table 6) shows the results of the Wald statistic test, which follows the χ^2 distribution at 5 degrees of freedom (df). The coefficients of the independent variables for the Tobit model as a whole showed their significance (%5). This is explained by the fact that the explanatory variables included in the model have a significant influence on the probability of the binary dependent variable (marketing efficiency). Therefore, we reject the null hypothesis (H_0), which indicates that the parameters of the explanatory variables for the Tobit model are equal to zero (Zahra and et al, 2024)

Table 6. Statistical test for Tobit model parameters

Wald Test: Equation: Untitled			
Test Statistic	Value	df	Probability
F-statistic	261.4367	(5, 55)	0.0000
Chi-square	1307.184	5	0.0000
Null Hypothesis: C(1)=C(2)=C(3)=C(4)=C(5)=0 Null Hypothesis Summary:			
Normalized Restriction (= 0)	Value	Std. Err.	
C(1)	0.873514	0.039355	
C(2)	-0.024579	0.003456	
C(3)	-2.738781	1.002955	
C(4)	0.012323	0.024613	
C(5)	-0.059101	0.026581	
Restrictions are linear in coefficients.			

Source: Researcher's work based on questionnaire data and using Eviews13 software

Efficiency of Marketing Institutions (Slaughterhouses)

Agricultural marketing seeks to ensure that farmers obtain appropriate and profitable prices for their products, helping them improve their standard of living and sustain their agricultural activities. Marketing focuses on providing various, high-quality agricultural products to consumers at appropriate prices and in sufficient quantities by organizing distribution and production. Agricultural marketing also contributes to reducing, Relying on imports and ensuring food availability, marketing plays an important role in reducing production loss by developing all means (packaging, packaging, storage and transportation) to reduce spoilage and waste of agricultural products. Institutional marketing in the agricultural livestock sector also aims to achieve a balance between the interests of the producer (slaughterhouse) and the consumer, with a focus on sustainability and achieving food security for society, as it plays a vital role in developing this vital sector (Oscar and et al, 2022). Slaughterhouses gather slaughtering operations in one equipped location, facilitating oversight and supervision by the competent authorities (Ministry of Agriculture, Ministry of Health, Municipalities), Licensed and regulated slaughterhouses are essential to facilitate the movement of meat trade and its safe and organized distribution in the markets. It is essential to provide data and statistics by slaughterhouses recording the numbers and types of animals slaughtered, which provides

important data to assist in planning and developing the livestock sector (Mbanasor and Kalu,2018). Slaughterhouses play a vital and essential role in the agricultural sector, as their importance goes beyond merely slaughtering animals; they create job opportunities, as each sector needs slaughterhouses to veterinarians, technicians, workers and administrators, (Heidari and et al,2021). and this in providing job opportunities in the areas where the slaughterhouse is located and its importance is also that by providing organized channels for slaughtering and marketing their animals it will help in ensuring that the producer gets an appropriate return for his products and this shows that slaughterhouses are not just places for slaughtering, but rather a vital infrastructure for developing the agricultural sector, as it contributes to environmental and economic sustainability as it ensures food safety, and protects public health, and that investment in developing and establishing this field (slaughterhouses) modern and equipped is considered one of the necessary steps for the advancement of the agricultural sector in Iraq (Kadhim and et al, 2024). The Connection between Slaughterhouses and Marketing Slaughterhouses are strongly linked to marketing. At first glance, it may seem that slaughterhouses focus primarily on health and operational aspects only. However, upon closer examination, we find that marketing is closely and influentially linked to them, especially in the development of the agricultural sector as a whole. At the heart of

the vibrant agricultural sector (Maskar and et al,2023), slaughterhouses can be vital centers where the threads of public health, industrial regulation, environmental sustainability, and the local economy intertwine, Slaughterhouses are the infrastructure that contributes to food safety and sector development. Integrating marketing into their operations enhances the value and competitiveness of agricultural products. The utmost importance of slaughterhouses lies in their role as faithful guardians of human health. Herds are screened to ensure they are free of diseases that could be transmitted to us through careful examinations conducted by veterinarians before and after slaughter, They are the first line of defense that protects us from common diseases and the clutches of epidemics due to the centrality of slaughtering operations and the application of technical and health standards, slaughterhouses guarantee the quality of the final product and facilitate the safe and organized movement of trade and distribution of meat. They are the compass that guides this industry towards excellence and efficiency. Slaughterhouses can be likened to the beating heart of the agricultural sector. They are essential centers that ensure our health, regulate our industry, protect our environment, and pave the way for successful and reliable marketing of our agricultural products. Investing in developing this vital infrastructure is an investment in the future and our economy. Calculating the technical efficiency of slaughterhouses requires a clear understanding of the processes, accurate data collection, and the use of appropriate analytical tools and techniques. This analysis can provide valuable insights for improving operational performance, reducing costs, and increasing the slaughterhouse's competitiveness. (Metwly and EL-saghir, 2025); (Zaho, 2022).

Assessing the technical efficiency of institutions (slaughterhouses) using the Data Envelopment Analysis (DEA) method.

The DEA model is a non-parametric mathematical method used to evaluate the efficiency of several establishments, especially when the objectives of the institutions are non-profit. The optimal selection of a set of inputs

and outputs is an important pillar in applying the Data Envelopment Analysis method because it affects the interpretation, use, and acceptance of the results. It also contributes to our constant quest to maximize the use of our resources and reduce waste in the vital agricultural sector, This method of Data Envelopment Analysis provides us with a panoramic picture of the performance of slaughterhouses, revealing their underlying strengths and weaknesses. It is not just a number that expresses efficiency; rather, it is a powerful analytical tool that enables us to understand the complex dynamics of the relationship between inputs and outputs, and direct our efforts towards achieving optimal utilization of our resources in this vital sector. It serves as a mirror that reflects the reality of performance as a compass guiding us toward a more efficient and sustainable future for our agricultural slaughterhouses, there are several approaches to selecting inputs, including that all inputs are analyzed in two stages: the first concerns controlled inputs, and the second concerns non-controlled inputs. This view is supported by others. The second approach proposes to divide the controlled inputs, which is also supported by others. The latter view indicates that the researcher has the right to select the inputs that he believes affect efficiency, especially those directly related to output. It also indicates that inputs have the ability to clarify the activities of the facility, and those who support it. The strength of DEA lies in its ability to address multiple inputs and outputs simultaneously, without the need to assign them pre-determined weights. It allows the data itself to reveal the most important relationships, and it provides us not only with an assessment of efficiency, but also with realistic goals for improvement (Maskar and et al, 2023). To estimate technical efficiency, the assessment was conducted using inputs, as slaughterhouse management has greater control over its inputs than over increasing its outputs (output). That is, it can increase or decrease the use of inputs or reduce the use of inputs more than it can ensure an increase in outputs. With the statistical data collected through a slaughterhouse questionnaire, the inputs used to estimate efficiency were the

number of workers and the quantity of chicken entering the slaughterhouse during the study period, These inputs affect the slaughterhouses outputs. A balance was taken into account between the number of inputs and outputs and the number of establishments included in the assessment (as the total number of inputs and outputs should not exceed twice the number of establishments included in the assessment). Specialists believe that the number of units included in the assessment should be greater than or equal to twice the total number of inputs and outputs). Technical efficiency was measured using the DEA program, and its results were as follows (Gocsik and Broshoof, 2016); (Zaha, 2024).

Capacity Efficiency (CE): Measuring capacity efficiency in the study sample requires us to measure technical efficiency (TE). In light of both the constant return to capacity and the change in return to capacity, to calculate the capacity efficiency by dividing the technical efficiency TE in light of the constant return to capacity by its counterpart in light of the change in return to capacity, the table shows (the results of the capacity efficiency, which were between (0.994-1) with an average of (0.998), meaning that the studied slaughterhouses can increase their production by 1%, meaning that they lose some of their economic resources (the inputs used to obtain the outputs). The data envelope method indicates that the slaughterhouses whose efficiency index is less than 100% are inefficient, as shown in this table. The number of slaughterhouses that achieved full efficiency in the study sample reached five slaughterhouses, which were in the slaughterhouses (Nineveh, Al-Mazra'a,

Khairat, Dohuk and Taji), and they operate at their optimal sizes according to what the volume yield index showed, meaning that the outputs of these slaughterhouses increase at the same rate of use in increasing the resources available for marketing operations for poultry. For the farm slaughterhouse, the capacity efficiency index was efficient because the capacity efficiency is 100%, and the slaughterhouse of Al-Khairat showed an efficiency index for its capacity, which means that the slaughterhouse is efficient and operating at the optimal size (39). A number of slaughterhouses were efficient, but not 100%, as they operate with increasing volume returns according to the volume return index, meaning that it is possible to increase its use to raise efficiency and reduce costs according to the ratio of each efficiency for each slaughterhouse. As for the technical efficiency ratio in light of the constant capacity return, which is one of the basics in calculating capacity efficiency, its value ranged between (0.897-1) with an average of (0.946), meaning that the studied slaughterhouses can increase their production by (6), meaning that they can achieve the same amount of outputs while reducing the percentage of inputs by (0.6), The Al-Tarmia slaughterhouses (Al-Malka) can increase their production because they achieved increasing volume returns (ris). As for the technical efficiency in light of the variable capacity return, it was between (0.899-1) with an average of 0.498. This indicates the possibility of increasing the outputs of the studied slaughterhouses by 6% without increasing any amount of input resources, i.e. used only by increasing their technical efficiency.

Table7. Capacity efficiency and technical efficiency under the stability of the variable of capacity return and volume yield for the sample of slaughterhouses

Slaughterhouses	Technical efficiency under constant capacity return	Technical efficiency under capacity return change	Capacity efficiency	Volume yield
Al-Tarmiya	0.897	0.899	0.999	Irs
Al-Malika	0.922	0.923	0.999	Irs
Al-Rayan	0.932	0.934	0.998	Drs
Al-Bawadi	0.899	0.905	0.994	Drs
Ninawa	0.961	0.961	1	-
Al-Rawdhatain	0.915	0.922	0.997	Drs
Al-Mazraa	1	1	1	-
Biyadir	0.921	0.924	0.997	Drs
Al-Khair				
Al-Hadbaa	0.906	0.911	0.994	Drs
Al-Khairat	1	1	1	-
Duhok	1	1	1	-
Al-Taji	1	1	1	-
Mean	0.946	0.948	0.998	

Source: The researcher's work is based on DEA.21 program

The (table 7) showed that the slaughterhouses (Al-Mazra'a, Khairat, Dohuk and Taji (which achieved technical and volumetric efficiency for all study indicators, as its efficiency was equal to the correct one, which means that it is operating at the maximum weighted volume.

CONCLUSIONS

It was concluded that there was fluctuation in poultry meat production during the period under study, based on a study of broiler production. The research hypotheses related to the efficiency of slaughterhouse marketing institutions were confirmed, and there are factors influencing marketing efficiency. Furthermore, weak marketing services were demonstrated along the marketing paths for broiler marketing. It was concluded that marketing costs and margins are high despite the weak marketing services provided by intermediaries along the marketing path. A study of the reality of consumption also revealed weak consumption of poultry meat products. The research recommends the need to work on improving the performance of marketing services along the marketing path, as well as presenting conclusions to broiler farmers to ensure stable production. It is also necessary to ensure that regulatory bodies fulfill their role and monitor the product's movement along the broiler marketing path. Marketing institutions operating in the field of broiler marketing should be supported to ensure they provide better services and more efficient.

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CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

AUTHOR/S DECLARATION

We confirm that all Figures and Tables in the manuscript are original to us. Additionally, any Figures and images that do not belong to us have been incorporated with the required permissions for re-publication, which are included with the manuscript.

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All authors made equal contributions to the study design, methodology, experimental work, data analysis, and manuscript writing. All authors reviewed and approved the final version of the manuscript.

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تحليل اقتصادي للعوامل المؤثرة في كفاءة تسويق لحوم الدواجن في محافظة بغداد للعام 2024

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المستخلص

هدف البحث الى دراسة واقع تسويق منتجات لحوم الدجاج والمؤسسات التسويقية المتخصصة في هذا المجال وايضا دراسة الكفاءة التسويقية لتسويق المنتجات ضمن القنوات التسويقية وتركزت مشكلة البحث بأن تسويق فروج اللحم يعاني من مشاكل كثيرة منها ما يتعلق بضعف كفاءة أغلب الخدمات والوظائف التسويقية ومنها النقل والتدريج والتعبئة والتغليف والتوزيع والخزن بالإضافة الى ارتفاع الهوامش والتكاليف التسويقية مقارنة مع كفاءة الخدمات التسويقية مما يتطلب دراستها وبحثها , اذ يفضل العديد من المزارعين الاستثمار في هذا العمل لما تتمتع به اعمال تربية الدواجن بالكثير من الفوائد ولسرعة دورة راس المال فيه. أظهرت النتائج وجود ضعف العلاقة بين عدد سنوات الخبرة ومستوى الكفاءة التسويقية. ومن خلال نموذج Tobit وباستخدام طريقة M.L و الاستعانة ببرنامج Eviews 13 تم تقدير انموذج Tobit لمعرفة تأثير أهم العوامل المستقلة (الكمية التسويقية، نسبة الفقد البيع لجهات غير تجار التجزئة نوع الحيازة التعامل مع الكميات المستوردة) على كفاءة تسويق فروج اللحم اذ يستخدم الأنموذج لمعرفة تأثير العوامل التوضيحية على مستويات الكفاءة التسويقية. فقد تبين ان العمليات التسويقية لمنتجات فروج اللحم دوراً مهماً في وصوله الى المستهلكين بصورة جيدة وبأسعار مناسبة مما يتطلب دراسة الكفاءة التسويقية ومكوناتها للحوم المنتجة في القطاع الخاص. وللعمليات التسويقية لمنتجات فروج اللحم دوراً مهماً في وصوله الى المستهلكين بصورة جيدة وبأسعار مناسبة مما يتطلب دراسة الكفاءة التسويقية ومكوناتها للحوم المنتجة في القطاع الخاص . توصي الدراسة بتحسين الخدمات التسويقية لمزارعي دجاج اللحم لضمان استقرار الإنتاج وتحقيق الكفاءة التسويقية.

الكلمات المفتاحية: كفاءة السعة ، الوظائف التسويقية, مسلك تسويقي, صناعة الدواجن, المجازر.