An econometric analysis of the factors affecting the production of buffalo milk in Western stream district - Karbala province for 2021

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Abstract

The study aimed to estimate the production costs of buffalo milk, and to estimate the economic efficiency of buffalo breeders in the study area through the application of economic efficiency standards and their most important components, in the district of the Western Table in the Holy Karbala Governorate, an applied field of study for its relative importance at the governorate level . The data were collected through a random sample that included (100) respondents, It represented 10% of the study population based on a questionnaire prepared for this purpose, and by using the transcendent logarithmic production function TL by the Maximum Likelihood method in estimating the values of parameters.All the parameters of the logarithm square of the variables have a positive sign, except for the square of the logarithm of working hours and green feed, and the logarithmic function of the maximum probability reached a positive value (27.5), indicating that there are technical changes that positively affect the random variable and thus the technical efficiency. The logarithmic transcendental production function was estimated according to the random border analysis and using the Frontier program and by the method of greatest possibility ML, including it was found that an increase in the number of herds by 1% leads to an increase of 1.17, but under the unstable it was (833.0) and the results reached the capacity (0.47) It included the results of estimating the economic efficiency and its components by the method of analyzing the data envelope according to the variables of the cost function, where the average technical efficiency was (0.834), the average allocative efficiency was (0.76) and the average economic efficiency was (0.627),The most important results that I reached from applying these criteria are that all of them were positive and that the net cash income constituted 99% of the net farm income at the sample level, and that the fields achieved a return to the invested dinar of (1.22) at the sample level.The research recommends directing and encouraging buffalo breeders with the need to expand buffalo breeding projects and take advantage of the advantages of large production. The study aimed to estimate the production costs of buffalo milk, and to estimate the economic efficiency of buffalo breeders in the study area through the application of economic efficiency standards and their most important components, in the district of the Western Table in the Holy Karbala Governorate, an applied field of study for its relative importance at the governorate level.The data were collected through a random sample that included (100) respondents representing 10% of the study population, based on a questionnaire prepared for this purpose, and by using the transcendent logarithmic production function TL by the Maximum Likelihood method in estimating the values of parameters,All the parameters of the logarithm square of the variables have a positive sign, except for the square of the logarithm of working hours and green fodder, and the logarithmic function of the maximum probability reached a positive value (27.5), indicating that there are technical changes that positively affect the random variable and thus the technical efficiency. The logarithmic transcendental production function was estimated according to the random border analysis and using the Frontier program and by the method of greatest possibility ML, including it was found that an increase in the number of herds by 1% leads to an increase of 1.17, but under the unstable it was (833.0) and the results reached the capacity (0.47)It included the results of estimating the economic efficiency and its components by the method of analyzing the data envelope according to the variables of the cost function, where the average technical efficiency was (0.834), the average allocative efficiency was (0.76) and the average economic efficiency was (0.627),The most important results that I reached from applying these criteria are that all of them were positive and

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that the net cash income constituted 99% of the net farm income at the sample level, and that the fields achieved a return to the invested dinar of (1.22) at the sample level. The research recommends directing and encouraging buffalo breeders with the need to expand buffalo breeding projects and take advantage of the advantages of large production

Introduction

The agricultural sector represents the mainstay of the national economy in many countries of the world, due to its economic importance. Buffalo breeding is a major agricultural activity for rural families in many developing countries, including Iraq. Where this animal is witnessing a trend towards its development in quantity and quality in many countries of the world as part of the process of developing the agricultural sector and achieving self-sufficiency in agricultural production, and this wealth is characterized by its weak milk production in quantity and quality. Buffalo breeding farms are important through their contribution to milk production, as buffalo milk production contributes 11.06% of the total milk in Iraq (Ministry of Planning, 2020). Buffalo milk is characterized by a high percentage of fat (7-10%), which is twice the percentage of fat in cows (Ali, et al., 2010, 1), and the percentage of lactose sugar was 4.58%, and the non-fat solids amounted to 11.47% (Abdullah, 2018). The importance of milk and milk products in strengthening food security, as well as in meeting the consumer's need in order to reach self-sufficiency and economic efficiency can be used in how to direct and coordinate various activities, whether at the level of the production unit or at the sectoral level or at the national level because of its importance in directing the economic resources of the production units and in order to achieve the optimal use of economic resources .Efficiency, in its general sense, expresses the achievement of the greatest level of production at a certain level of available technology, while (Al-Daoudi, 2010, p220) defined it as the value of the enterprise's profitability, meaning that efficiency is the measure of profitability (returns) in the enterprise, that is, it is related to the outputs, (Kalu and Mbanasor, 2008 , 313)and that the development of alternatives that lead to achieving economic efficiency is the main goal that production units seek, and that Economic Efficiency.It includes both Technical Efficiency and Al locative Efficiency. Milk is one of the most consumed drinks in the world, due to its multiple health benefits thanks to its nutritional value. Due to the increasing demand for milk, the dairy production industry has become one of the most competitive industries in the world, and these products occupy a great importance in food consumption, as they are a good source of protein and are considered a good source of protein for this.

Research problem :-

The agricultural sector in Iraq faces many obstacles, with regard to plants and animals, where livestock in general and milk production in particular suffer in light of the current conditions that the country is going through, local challenges and global changes. Where buffalo breeders, like other breeders of livestock, often lack the optimal use of economic resources, To improve the reality of milk production in addition to the rise in production costs, and this was negatively reflected in achieving self-sufficiency despite the presence of a large number of livestock projects for the production of milk and its derivatives in Iraq. Likewise, Iraqi products in general and milk products in particular suffer from their inability to compete due to the presence of many markets, due to what the agricultural sector suffers from wasting natural resources and not investing them in an optimal way to achieve economic efficiency.

The aim of this study is to:-

1- Identifying the productive relations of buffalo breeders in the holy Karbala Governorate / Western Table District.

2- Estimation of the efficiency of milk production of buffalo breeding in the holy governorate of Karbala, the district of the Western Table

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3- Studying the relationship between efficiency and sizes of buffalo breeding projects

Research hypothesis:

Although the buffalo breeding projects are economically viable, there is a disparity in the failure to optimally utilize the economic resources available for the production of buffalo milk in the study area, making the level of economic technical efficiency in it a negative impact on the production of milk and its components. Direct effect production .

Materials and methods:-

The quantitative research method is based on conducting an economic analysis that is based on statistical and standard methods to evaluate the obtained results and through the production and cost functions of the transcendental production function (TL). We will adopt the ML method in estimating the transcendental production function, using the Frontier TL program.The data was obtained through the questionnaire form prepared for this purpose and for a random sample that included (100) breeders from the research community, which numbered (1000) breeders in the district of the Western Table through personal interviews in the district (study area) for the agricultural season 2021,and within the SFA method, according to the excelled logarithmic production function TL, to estimate the technical efficiency of the sample farms to know and measure the technical efficiency for each farm.

LnY=B0LnX+(vi-ui)

Since:-

Yi = total quantities produced on the farm 0

Xi = Quantities used from the inputs in the output

Vi = Normally distributed random error with an arithmetic mean equal to zero and a constant variance. It represents the standard error and the conditions out of control for the farmer.

In calculating the technical efficiency, the Frontier program was used, which allows estimating random production limits and obtaining estimates for the maximum parameters of the function. The estimation process goes through three steps (Herrero, and Pascoe, 2002.4).

Results and discussion

Model Description

When studying any relationship between a number of variables, the most important step for econometrics is to formulate this relationship in a mathematical way to obtain a model that studies economic phenomena in an applied manner. This step is called the formulation of confirmed hypotheses. This step requires determining the dependent and independent variable. It is affected by a number of determinants, as:

yi: the total quantities of milk produced annually, estimated in kg

X1: Annual quantities of green fodder, estimated in kg

X2: Amounts of dry fodder annually, estimated in kg

X3: Amounts of concentrated feed annually, estimated in kg

X4: herd numbers (unit/year)

X5 : Working hours (unit/year)

vi : random variable (uncontrolled errors)

ui : a random variable representing technical incompetence.

First: The results of the TE efficiency estimates using the Stochastic Frontier Approch method for the sample fields 0

And by relying on the parametric stochastic analysis method SFA according to the logarithmic superior transcendental production function TL, and by using the technical efficiency model TE that was described previously and which includes the explanatory variables of the production

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function, By focusing on the basic inputs used in all the sample fields, which included as well as the dependent variable the independent variables (the amount of concentrated feed, the amount of dry forage, the amount of green feed, working hours and the number of herd) Estimates of the parameters of the explanatory variables mentioned for the transcendental logarithmic production function were obtained by three methods, namely, ordinary least squares (OLS), corrected least squares (COLS), the method of greatest possibility, and the results of the estimation are shown in the following table:

Table (1) Estimating the parameters of the TL transcendental logarithmic production function using the Maximum Likelihood method

Parameters	Parameters value by OLS	The value of the parameters in the COLS method	Parameter value in ML . method	t.r
Beta0	23.95	24.14	25.06	3.11
Beta1	(5.79)*	(5.79)*	(6.10)*	(2.73)*
Beta2	0.02	0.02	0.02	0.03
Beta3	0.12	0.12	0.12	0.33
Beta4	1.19	1.19	1.17	2.69
Beta5	(2.51)*	(2.51)*	(2.62)*	(1.25)*
Beta6	0.93	0.93	0.98	2.70
Beta7	(0.01)*	(0.01)*	(0.01)*	(0.08)*
Beta8	0.01	0.01	0.01	0.08
Beta9	(0.0004)*	(0.004)*	(0.0004)*	(0.04)*
Beta10	0.18	0.18	0.19	1.22
Beta11	0.00 006	0.00 006	0.00008	0.46
sigma-squared	0.11	0.0.13	0.0.14	log likelihood function =27.5

Source: Prepared by the researcher based on the data of the questionnaire form and the statistical program Frontier

*Between the negative brackets

From the above table, it is clear that the Ordinary Least Squares (OLS) method gave a modest estimate that was expected for the discontinuous part (B0), as the parameter value amounted to 23.95, but it is less than the corrected least squares values, while this corrected value was on the corrected squares. COLS) is (24.14), and the method of greatest probability (ML) is (25.06),The values of the parameters of the explanatory variables of the transcendental logarithmic function represent the production elasticities of these variables, where the table shows the value of the parameters of the Translog production function by OLS method and after correction down to the value of the ML method, which will depend on the variable values of the parameter and the variable in the interpretation of the relationship. The estimations obtained by the ML and OLS method They were identical, as with the increase in the number of observations and the larger the sample size, the estimations of ML and OLS were unbiased, including the variance of the random variable (Gujrati. Compared to other methods:

The results showed that the indication of the parameters of some variables (land feed, concentrated feed, herd numbers) was identical with the logic of the economic theory, confirming the positive impact of these variables on the quantities produced from buffalo milk, meaning an increase in the explanatory variable by 1% leads to an increase in the quantity of milk produced.

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0.02 and 0.12), respectively, and by (OLS, COLS. ML) methods for dry fodder X2 and concentrated feed X3, while the percentage of no numbers of herd X4 was (1.19) by two methods (OLS,COLS) and (1.17) by the method (ML) and significantly (0,03). 33 and 2.69), respectively, while the parameters of the variables (working hours X5, green fodder X1) were negative and by (-2.51) by two methods (OLS, COLS)) and by (2.62) by (ML) and this contradicts the logic of economic theory and confirms the negative impact For these variables in the dependent variable i.e. an increase in the quantities of the green fodder variable X1 by 1% leads to a decrease in the milk produced by (-5.79) by two methods (OLS, COLS) and by (-6.10) by (ML) method, which is not significant if the value reaches (-2.73) and this It is contrary to economic logic, and the reason for this is due to an inverse relationship Because the data of the research sample interaction and for a number of reasons, including the main reason for the lack of areas planted with green fodder within the sample area and the concentration of the majority of breeders in these areas, which leads to competition to buy green feed close to them and buy it at high prices, as well as for reasons due to saving transportation expenses and risking the way. This led to an increase in the prices of green feed, as well as its use in large quantities for animals instead of other feeds.

As for the working hours X5, when an increase of 1% leads to a decrease in production by (-2.51) by two methods (OLS and COLS) and by (-2.62) by (ML), as well as insignificantly if it came by (-1.25), which is contrary to the logic of economic theory and the effect is confirmed The negative of these variables in the dependent variable This variable is a reference to the negative relationship between work and production due to various reasons, including the lack of sufficient skill at work and the presence of an excess number of different categories of individuals and represents just follow-up and fear of some of them and taking caution and attention from the damage caused by the herd, which in turn led to Increasing the hours of some herd service operations

The results are significant, and all parameters of the logarithm square of the variables have a positive sign, except for the square value of the logarithm of working hours and green fodder, but it is not necessary for the parameters of the estimated function ML to be statistically significant. Taken from it (Kouttsoyiannic,1981,442)0. The logarithmic function for the maximum probability reached a positive value (27.5) indicating that there are technical changes that positively affect the random variable and therefore the technical efficiency, and the logarithmic transcendental production function was used whose parameters were evaluated Estimation methods OLS, .COLS, and ML in estimating the technical efficiency TE of the sample fields separately as an average of the sample according to the method of SFA random bounds analysis using the Frontier program. The results are fixed in Table (2).The failure of economic resources to achieve an efficient economic level may be due to the high prices of resources, especially concentrated and green feed, which is the mainstay in buffalo breeding, and the lack of government support for livestock in general and for buffalo in particular, and the absence of milk collection centers in the study area.In addition to the ignorance of some breeders about the optimal and rational exploitation of the production inputs used in raising buffaloes, the weakness of veterinary services and the lack of awareness-raising regarding buffalo management and breeding, and thus the lack of economic efficiency

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Table (2) The results of the estimates of the technical efficiency of the buffalo breeder in the research sample for the year 2021 using random limits according to the variables of the production function

Technical Proficiency %TE	field	Technical Proficiency %TE	field	Technical Proficiency %TE	field	Technical Proficiency %TE	field
0.87	76	0.84	51	0.84	26	0.81	1
0.51	77	0.84	52	0.75	27	0.79	2
0.82	78	0.86	53	0.87	28	0.67	3
0.8	79	0.81	54	0.86	29	0.81	4
0.9	80	0.79	55	0.83	30	0.79	5
0.82	81	0.81	56	0.76	31	0.94	6
0.79	82	0.87	57	0.85	32	0.87	7
0.78	83	0.86	58	0.86	33	0.86	8
0.84	84	0.85	59	0.82	34	0.82	9
0.85	85	0.79	60	0.87	35	0.81	10
0.9	86	0.84	61	0.85	36	0.83	11
0.86	87	0.91	62	0.77	37	0.83	12
0.81	88	0.87	63	0.79	38	0.84	13
0.86	89	0.87	64	0.8	39	0.81	14
0.91	90	0.87	65	0.82	40	0.86	15
0.88	91	0.9	66	0.74	41	0.8	16
0.78	92	0.85	67	0.79	42	0.83	17
0.86	93	0.83	68	0.79	43	0.81	18
0.83	94	0.82	69	0.88	44	0.82	19
0.84	95	0.75	70	0.87	45	0.82	20
0.92	96	0.89	71	0.77	46	0.8	21
0.88	97	0.88	72	0.88	47	0.85	22
0.79	98	0.86	73	0.88	48	0.86	23
0.79	99	0.69	74	0.86	49	0.79	24
0.88	100	0.8	75	0.77	50	0.87	25

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0.82	average
0.94	highest value
0.51	lowest value

Source: Prepared by the researcher based on the data of the questionnaire

It is clear from the table that the highest value of technical efficiency reached 94% at a field in sequence (6) in the table above, meaning that this field is close to the level of complete efficiency.It was able to achieve the highest output among the breeders in the sample with a limited number of inputs, meaning that this field produces this amount of production using only 94% of the inputs or less. While the lowest efficiency level reached (51%) at a field in sequence (77), as the field that achieved this value, in order to reach the efficiency stage, must produce the current amount of output or more using only 51% or less of the current inputs. The average technical efficiency at the sample level was 82.88%, and this result indicates that breeders can increase their production by 17.12% without increasing any amount of economic resources used in the production process. This means that the sample loses a certain amount of economic resources equivalent to economic costs and thus 17.12% of resource costs.It also means that the breeder can produce the same previous product with less resources by approximately 17.12% of the resources used, and that the average efficiency indicates that there is a deviation in the actual production at the optimal production by 17.12%.and educators can achieve this if the available economic resources are used extensively, for example. It should be noted here that the sample breeder did not achieve 100% full economic efficiency, and therefore all the breeders did not produce in terms of productive capabilities and strayed away from them in different proportions. This means that the breeder has the opportunity to reduce the quantities of economic resources used to obtain the same level of output or use the quantities of resources used to obtain the highest level of production. When dividing the levels of technical efficiency into different levels, it was found that 28% of the breeders whose technical competence was limited to between 51-80 and this is due to the great waste of some resources, especially family work and green, concentrated and dry fodder, compared with other breeders.While 65% of the fields whose technical efficiency was limited to between 81-89, and 7% of the total sample achieved levels of technical efficiency above 90%, and these results were reached in an approach with the results reached.

Table (3) The levels of technical competence of the buffalo breeder in the research sample for the production year 2021 and the number of fields and the proportions of each of them from the total number of fields in the research sample

Relative importance	number of fields	Technical Proficiency %TE
28	28	51-80
65	65	81-89
7	7	90 or more
100	100	total

Source: compiled by the researcher based on the results of table (21).

Second: Technical efficiency, distributive efficiency, and economic efficiency of the resources used in the study sample:

In this part, we have three standards of efficiency: technical efficiency, distributive efficiency, and economic efficiency, which are directly exposed to production costs in

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light of resource prices or their production cost and by reviewing Table No. (4), which shows the results of these standards, which indicate that technical efficiency has reached an average of 83.),It is the same result that was discussed in light of the variable return on capacity to calculate the efficiency of capacity, which indicates that these fields allow the loss of some of their resources as a result of inefficiency, which led to an increase in cost by 17%, and was used again in calculating the cost efficiency. The economic efficiency and its components, both the technical and allocative efficiency of the buffalo breeder in the study sample, were estimated using the data envelope analysis method and according to the cost function variables. In light of the quantities and prices of the resources used and assuming a change in volume returns, the results of the estimates of economic efficiency (EE), technical (TE) and allocative (AE) were fixed.By reviewing these results, it was found that the levels of technical efficiency of the research sample ranged between a minimum of about (5%) and a maximum of about 100%, with an average of about (83%).As for the distributive efficiency, it ranged from 33% as a minimum and the correct one as a maximum, with an average of 0.76 at the sample level. This result indicates that the breeder allows to lose a certain amount of resources as a result of inefficiency, which led to an increase in cost by 24%. It was used again in calculating the cost, which was achieved by saying that the statement 100% distribution, amounting to 2 fields, which constituted 2% of the total sample Also, the average distributional efficiency indicates that the production costs used in production exceed the lowest point of the average costs on the average cost curve by 10%. This means that the breeders do not have the ability to choose the optimal resource combination, especially that most of the resources are bought from the black market and at a high price The absence of government support, which is reflected in the distributive efficiency, which predicts the existence of a large waste of resources, a surplus in the preparation of some variables, especially family work and feed.As for the economic efficiency, it came at an average level of 0.62, swinging between 0.30 - 1 0. This level is considered low and it is a reflection of the levels of technical efficiency and allocative efficiency, which is the sum of their products. This means that these fields increase their costs at an average cost that is at an average point high. Fields can reduce costs by 38%.The same level of production is achieved, meaning that the sample is capable of producing the current amount of products using only 62% or less, and then becomes economically efficient.This result, i.e. a decrease in economic efficiency, may be due to the reality experienced by the agricultural sector in light of the high prices of production requirements, especially fodder, as well as a section of breeders who depend in buffalo breeding on buying green feed mainly because of the high prices of the rest of the feed and the inability to purchase them In the process of mowing and transporting the grass, most of it is located in places far from the site of the breeder field. This requires other expenses for the process of packing and unloading in addition to the means of transportation.This led to an increase in production costs accompanied by a decrease in output prices due to imports and weak government support, especially concentrated feed, and the absence of product protection on the other hand, and the poor productivity of buffaloes. As it was compared to the amount of waste of resources, especially the family work component, these combined reasons and others helped in declining economic efficiency and then allocative efficiency Table (4) and Figure (1)

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Table (4) The results of estimating the economic efficiency and its components for the buffalo breeder in the research sample for the production year 2013 by the method of analyzing the data envelope according to the cost function variables

Economic Efficiency EE%	Allocative efficiency AE%	Technical Proficiency %TE	field	Economic Efficiency EE%	Allocative efficiency AE%	Technical Proficiency %TE	field
0.84	0.84	1	51	0.486	0.751	0.646	1
0.802	0.854	0.939	52	0.863	0.863	1	2
0.625	0.625	1	53	0.782	0.782	1	3
0.806	0.901	0.894	54	0.542	0.542	1	4
0.757	0.82	0.923	55	0.788	0.882	0.893	5
0.627	0.903	0.694	56	0.46	0.46	1	6
0.458	0.458	1	57	0.548	0.846	0.647	7
0.35	0.35	1	58	0.576	0.696	0.827	8
0.506	0.506	1	59	0.605	0.895	0.676	9
0.465	0.842	0.552	60	0.343	0.502	0.683	10
0.652	0.973	0.671	61	0.615	0.615	1	11
0.663	0.813	0.815	62	0.755	0.755	1	12
0.769	0.769	1	63	0.623	0.623	1	13
0.602	0.63	0.956	64	0.386	0.586	0.659	14
0.699	0.699	1	65	0.562	0.562	1	15
0.632	0.797	0.792	66	0.62	0.844	0.735	16
0.556	0.556	1	67	0.759	0.836	0.908	17
0.896	0.908	0.986	68	0.432	0.831	0.52	18
0.88	0.909	0.968	69	0.715	0.968	0.738	19
0.451	0.861	0.524	70	0.493	0.847	0.582	20
0.914	0.914	1	71	0.33	0.33	1	21
0.716	0.933	0.767	72	0.617	0.819	0.753	22
0.566	0.604	0.937	73	0.468	0.654	0.715	23
0.524	0.917	0.572	74	0.366	0.634	0.577	24
0.569	0.782	0.727	75	0.576	0.756	0.762	25
0.923	0.923	1	76	0.505	0.505	1	26
0.984	0.984	1	77	0.395	0.395	1	27
0.778	0.941	0.827	78	0.816	0.889	0.918	28
0.409	0.517	0.792	79	0.308	0.449	0.686	29
0.589	0.75	0.785	80	0.663	0.941	0.705	30
0.836	0.837	0.999	81	0.549	0.969	0.567	31
0.931	0.931	1	82	0.464	0.734	0.632	32
0.448	0.748	0.6	83	0.585	0.751	0.779	33
0.689	0.944	0.73	84	0.856	0.874	0.979	34
0.559	0.838	0.667	85	0.367	0.501	0.733	35
0.697	0.91	0.766	86	0.557	0.751	0.742	36
0.466	0.676	0.689	87	0.469	0.815	0.575	37
0.633	0.972	0.651	88	0.838	0.924	0.907	38
0.738	0.738	1	89	0.793	0.793	1	39
1	1	1	90	0.594	0.842	0.706	40
0.823	0.823	1	91	0.607	0.911	0.666	41
0.376	0.376	1	92	0.476	0.713	0.667	42
0.593	0.944	0.628	93	0.61	0.61	1	43

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0.728	0.728	1	94	0.635	0.851	0.747	44
0.599	0.599	1	95	0.52	0.725	0.717	45
0.378	0.378	1	96	0.459	0.75	0.613	46
1	1	1	97	0.72	0.79	0.912	47
0.647	0.818	0.791	98	0.589	0.841	0.701	48
0.551	0.692	0.796	99	0.863	0.945	0.913	49
0.87	0.87	1	100	0.553	0.76	0.727	50
0.627	0.76	0.834	average				
1	1	1	Limit				
0.308	0.33	0.52	Minimum				

Source: Prepared by the researcher based on the data of the questionnaire and the statistical program Deap

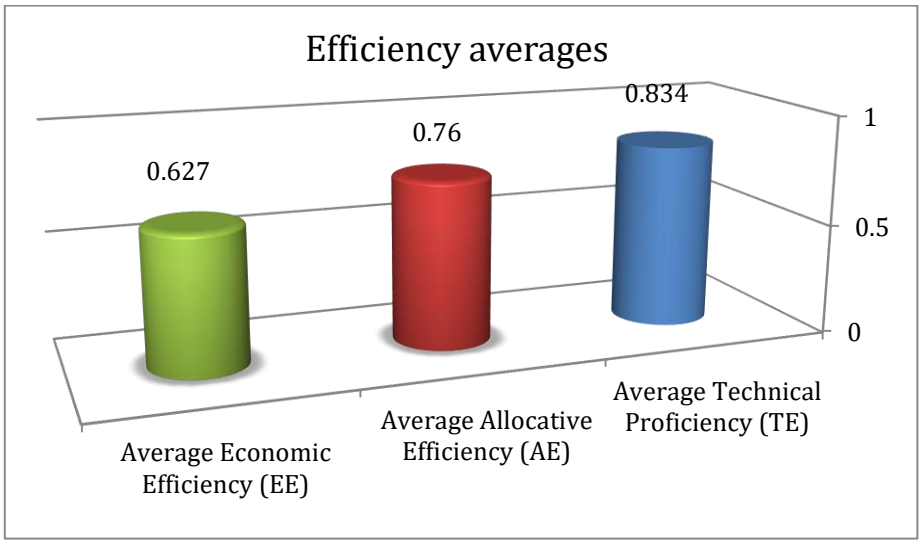

Figure (1) Levels of cost efficiency and allocative and technical efficiency of the sample

When dividing efficiency and its components into levels, we notice that most educators are far from achieving optimum economic levels. When looking at Table No. (5), we notice that 34% of the sample educators have achieved a technical efficiency level of 100%, meaning that they do not waste their resources in the use of levels as they formed the fields that were Its efficiency is greater than 80-100%, amounting to (18) constituted 18%, while the fields were limited to 60-100% efficiency, amounting to 58 fields, and they constituted 58% of the total sample, which is a relatively high percentage, which is evidence that 58% of educators tried Approaching the level of technical efficiency and moving away from the level of allocative efficiency due to the increase in prices or input costs with a surplus in some elements. As for the number of fields that achieved economic efficiency, the same ones that achieved allocative efficiency, as it reached 2% of the total sample, which is a decrease in the sample. The levels of allocative efficiency and then the economic efficiency, meaning that there is a percentage of wasting in the use of resources. She also indicated that the number of breeders who achieved a specialized efficiency at a level greater than 60% is 82% in fields, or 82%, and 13% work between the level of 40-60 and 5% operate below standard Efficiency is 40%, which is not actually reflected in the low levels of economic efficiency, as 10% of breeders produce less than 40%, and this means that the percentage of waste in resources or production costs is very high. The supply mix to achieve economic levels of complete or close efficiency.

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Table (5): Levels of economic efficiency and its components in the study sample

the percentage %	Efficiency Cost Number field	the percentage %	Distributive efficiency number field	the percentage %	Technical Proficiency Number of field	levels
%2	2	%2	2	%34	34	100
%17	17	%48	48	%18	18	100≤80≥
%33	33	%32	32	%40	40	80≤60≥
%38	38	%13	13	%8	8	60≤40≥
%10	10	%5	5	0	0	40>

Source: From the researcher's work based on "technical, distributional and cost efficiency levels."

Economic returns from buffalo breeding projects:

The basic functions that a farmer can undertake in his capacity as a farm manager is to work to raise the economic efficiency within the farm (the productive unit), by selecting the basic production elements and deciding how to mix them in the production process, or in other words, the management of those appropriate productive elements and the implementation of the appropriate productive elements. Choosing the best mixture and placing it in an investment program commensurate with the material and human capabilities available to it, as well as trying to introduce new methods in production processes by quoting everything that is new and useful in management. However, there are many economic, social and natural factors that prevent the achievement of this goal (raising economic efficiency), and among those factors are (1) the size of the farm, (2) the quantity and quality of the available financial and human investments, and the effectiveness in exploiting them, (3) the prices of production inputs and outputs. agricultural, (4) social norms and traditions, and other factors. In view of the convergence of agricultural production units in developing countries (including Iraq), which is characterized by the fact that the prevailing pattern of production is a convergent pattern to the family farm, which is characterized by weak management in achieving the jobs entrusted to it, so carrying out the process of evaluating the economic efficiency of such fields is beneficial In pointing out this defect and finding ways to overcome it, this evaluation process is carried out through several indicators or criteria that were discussed in the previous pages, and the following is a review of the results that could be reached through the application of those criteria in the study sample:

Net cash income:

The fields were divided into three categories according to the number of the productive herd of (1-10) buffaloes for small fields and medium fields from (11-19), as for large fields of (20) buffaloes or more, and the number of fields reached (5,14,81) for small and medium fields and big straight ,The results obtained from the use of net cash income showed that all fields achieved net cash income at different rates, where it reached its highest limit in the large fields, which constituted (40%) of the total net cash income, and the minimum amounted to (22%) thousand dinars in the medium fields. However, the net cash income at the sample level amounted to (1202422.564) thousand dinars

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Table (6) The net cash income for milk production in the study sample for the production season 2021 (in thousand dinars)

% of net cash income	net cash income	field
0,38	463404.874	small fields
0,22	260589.858	medium fields
0,40	478428.082	big fields
100	1202422.564	at the sample level

Source: Compiled and calculated by the researcher based on the questionnaire.

2- Dinar return invested:-

It is known that projects with economic feasibility are those in which the ratio of return to costs is more than (1) an integer number, and from the observation of Table (7) it was found that all fields achieved a return for the invested dinar more than the correct one, as it was the best return for the dinar invested in large fields It reached (2.65), and it was the lowest return for the dinar invested in small fields and amounted to (1.07), and (1.23) in medium fields, while at the sample level it achieved a return of (1.22).

Table (7) The investment dinar return for the study sample is estimated at one thousand dinars

Invested Dinar Return	annual costs of the project	annual proceeds of the project	field
1.07	2376572.366	2540438.67	small fields
1.23	587035.582	724065	medium fields
2.65	246920.938	655337.5	big fields
1.22	3210529.136	3919841.17	at the sample level

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

Conclusions and Recommendations

Conclusions:-

1. - The rise in the prices of raw materials, which is represented by the price of the herd and fodder, led to a weak yield of the milk of the herd, especially in the small fields in this field -

2. A decrease in average costs with the expansion of production and benefiting from the advantages of large production, and this was reflected in the return on the invested dinar, as it was the highest percentage in the large fields in these fields was low compared to the small and medium fields

3. Small holdings of green fodder and lack of water resources have had a negative impact on milk production

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4. There is a large surplus in the human labor component in the small fields, with a shortage of production inputs, especially concentrated fodder, due to economic conditions.

5. As a result of the lack of capital in small fields and the difficulty of covering feed expenses, it was noted that large fields consume concentrated feed in a greater proportion than small and medium fields, and this was positively reflected on the amount of milk production for that category.

Recommendations:-

1- Providing fodder, which is the main focus in raising buffaloes, so we recommend the necessity of providing breeders with sufficient concentrated feed at subsidized prices.

2- Paying attention to pastures to provide the necessary fodder for feeding buffaloes and other milk-producing animals by studying the areas where fodder can be grown, especially the resistance to environmental conditions and supporting them with production requirements

3- Improving and developing veterinary services in the study area by providing veterinary medicines at a subsidized price, providing all immunizations from epidemic diseases and following up on veterinary clinics to perform the veterinary service in an appropriate, correct and timely manner.

4- Conducting future research studies that work on developing genetic resources for buffaloes with all that is related to the selection of new breeds, milk and meat production, nutrition, animal health, and artificial insemination.

5- The necessity of establishing milk collection centers and receiving milk from breeders at a subsidized price in the study area, due to the large percentage of buffalo numbers in this area and to reduce losses.

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