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Evaluating the Economic Sustainability of Cow Fields in Baghdad Governoratefor 2023

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ABSTRACT

This research aimed to assess the economic sustainability of cow's projects in a comprehensive framework that considered economic and social dimensions. The research problem focuses on cow breeding in marginal areas with harsh climates, including high temperatures and low rainfall, resulting in limited grazing resources and poor conditions. Family-operated farms often neglect scientific management, leading to low economic performance and sustainability. Consequently, the added value from these operations is minimal. Data was collected from 72 cow farms in Baghdad province in 2023. The global evaluation methods were used of four indicators to reflect economic sustainability: profitability, liquidity, stability, solvency and repayment, i.e. 17 financial ratios were calculated within these indicators, showing that the profitability ratios were all positive, but they varied from one indicator to another, in small fields P1 reached 14.813, which indicates the capacity of the project and the possibility of the present value of cash flows from primary coverage, while in the medium fields, the liquidity ratios were high in L1, which amounted to 17.172, which is a good indicator where whenever increased whenever it indicates the ability of the fields to meet current obligations and debts through assets in this category, Stability ratios in large fields amounted to S1 0.877, S2 amounted to 42.791 and S3 amounted to 0.005 that the decrease in this ratio is evidence of the availability of capital to cover the debts of the project, and that the RC, which represents the ability to repay ratio, amounted to 0, i.e. there are no debts within this category, The aggregate performance index was calculated, and the calculation of ZA, which is the American aggregate index, and ZE, the European aggregate index, Divide the fields into four groups according to performance, where the aggregate indicator in the first quarter or the poorly performing field (Quarter Y1) varied 3.459, and in the fourth quarter or the well-performing field (Quarter Y4) amounted to 168.691, The research concluded that sustainability indicators must be included in financial evaluations to assess the validity and feasibility of projects over time. Moreover, certain ratios used in America or Europe may not be applicable in Iraq due to differences in data or their unsuitability for animal production projects. This leads us to distinguish whether feasibility or project sustainability should be viewed as a measure of opportunity cost, as suggested in European literature, or as a measure of family well-being, as indicated in American research.

Keywords: Environmental Pressure,Farm Management. Farm Viability,Financial ratios, RISE Method.

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INTRODUCTION

A family farm is the dominant form of farming globally. FAO estimated in 2014 that there are 500 million farms in the world that can be classified as family farms, which means that family farming is of great importance for a variety of reasons including food security, it provides 80 percent of the world's food, contributes to the sustainability of rural areas, and that cow farming in Baghdad province falls within this range, contributing to farm income (Enas and. Amera, 2024). Supporting

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farm viability by "ensuring a fair standard of living for the farming community" is one of the main objectives of agricultural policy. Measuring the feasibility of a farm, in terms of achieving a specific income goal, is the simple option for determining the effectiveness of that goal. With the change and restructuring of the agricultural sector, the increase in pluralism and the increasing contribution of other sources of income, the issue of economic and environmental sustainability of the farm has become the desired goal, Measuring agricultural economic sustainability has received sporadic academic attention lately, while conceptual discussions are often minimal. Furthermore, this concept receives more attention in periods when the sector is facing difficulty. Measuring farm viability is an important prerequisite to enrich these discussions. Therefore, it is necessary to develop more comprehensive and detailed measurement techniques to provide greater clarity on the levels of feasibility and vulnerability in the sector, and the need to measure the feasibility of the farm to benefit from them. Assessing farm sustainability based on quantitative indicators is a growing concern in agricultural science. Agricultural production provides a wide range of public goods for the community. These commodities cover the environment (biodiversity), social (rural vitality) and economic issues (food security). Due to their great interdependence, all three dimensions are equally important (Merle & Brown , 2006). It is therefore necessary to focus on measuring sustainability to cover the environmental, social and economic dimensions and provide a comprehensive view of farm sustainability assessment. These assessments can be classified according to different criteria such as their primary purpose, level of evaluation, and geographical, sectoral and thematic scope. Likewise, from a sustainability perspective, the Food and Agriculture Organization of the United Nations (FAO) has published the Comprehensive Strategic Framework (CSF), guidelines for providing a comprehensive global frame of reference, intended to offer convergence within existing sustainability tools. This framework includes a wide range of indicators in sustainability, according to the (Olson, 2010) classification. There are different approaches to this scope, most of which deal with European countries and some with a global geographical scope. Within the framework of farm-level evaluation plans, qualitative and quantitative indicators are applied in parallel. Economic sustainability at the farm level is defined as the viability of a farm (in the long term), taking into account opportunity costs. Economic sustainability is generally seen as economic viability, whether agriculture is sustained over the long term in a changing economy. However economic sustainability is rarely used as a benchmark, as it usually extends beyond these indicators. For this, a wide range of indicators are proposed for sustainable farming systems, Because the transition to sustainability or the implementation of sustainability requires consideration of ecological and economic indicators. In other words, we need a deeper look at economic, social and environmental indicators. Sustainability assessment is emerging worldwide as a key decision-making tool, coinciding with the creation of national sustainable development strategies (which have spread since the Earth Summit in Rio de Janeiro in 1999). (Mahmud, and Karadaş. 2023) believes that sustainability assessment is best considered a comprehensive term that encompasses a set of impact assessment practices. Environmental, Social and Health Impact Assessments (ESHIA) can also be considered as forms of sustainability assessment, and impact and benefits agreements in Canada, integrated development plans in South Africa and so-called "sub-evaluations" can be considered components of sustainability assessment (Galbraith, et al., 2005). The research problem becomes clear when we observe that cow farming is usually prevalent in most marginal areas, with harsh climatic conditions (extreme temperatures and low rainfall) with no grazing resources and characterized by high seasonality and generally low quality. Cow are raised within the framework of family projects that do not rely on the concept of scientific management in the use of resources, a decrease in the number of herds due to the significant change

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in the structure of the cow sector as many farmers have abandoned this activity or switched to another activity. Despite structural constraints, fragmentation, small size of production units or abandonment of agriculture in rural areas, several factors, both at the farm level and the social, economic and physical context in which the farmer operates, can be emphasized as contributing to this phenomenon. These include the decline in profitability of the activity, the increased risk of economic marginalization, and the general intensification process to increase livestock productivity, which does not always lead to higher economic performance and efficiency and is therefore unsustainable and unsustainable Its added value is low. Therefore, the research aimed to assess the economic sustainability of cow projects in a comprehensive framework that takes all economic, social and environmental dimensions into account, based on the premise that cow projects in Baghdad province are economically unsustainable and that they are unsustainable, but they have good potential that can be viable and sustainable, and that taking the evaluation criteria for sustainability and the project's ability to live is one of the modern and important topics that It has still not been researched in Iraq or Arab research, but it has been addressed in several foreign studies, including the study (Segerkvist, et al.,2010) in 2014 on comparative analysis of farm economic feasibility assessment, through which it showed the strengths and weaknesses of economic evaluation methodologies. It has been found that agricultural economic feasibility varies in the assessment from country to country and is determined by (differences in the natural environment, different subsidy policies, return on equity, labour productivity and productivity). Land) was applied to Lithuanian farms and compared the results obtained with similar results from farms in EU countries, where the methodologies were based on 23 financial ratios and 10 non-financial indicators, including 5 recurring indicators. In 2015 (Escribano, et al.,2015) comparative sustainability assessment of large-scale cow farms explained the sustainability of cow systems in Spanish pastures known as "Dehisas". The study provided a comparative assessment of the sustainability of the different traditional and organic beef production systems found in the Dehisas pastures. The results showed that Organic Farms 2 recorded the highest results, reaching 66.55% in most sustainability features, as well as in the environmental and economic dimensions of sustainability, thus being one of the most sustainable systems. In 2016 (Soteriades, et al.,2016), introduced an approach to a comprehensive assessment of the environmental efficiency of dairy farms by combining life cycle analysis with data envelope analysis models and methodologies, the study showed that eco-efficiency is a useful guide to analyzing the sustainability of dairy farms to increase material output or value added, and reducing environmental impacts. 2016 used models The qualitative response to measure the efficiency of cow fields for a random sample of 19 fields in Abu Gharq district in Babil governorate and recommended promoting the use of qualitative response models as an effective tool to understand the impact of all independent variables on the economic outcomes of cow fields. (Stephanie, et al.,2020) argued that meat cows have the weakest efficiency in converting feed into meat. However, these metrics fail to take into account that livestock Meat produces high-quality protein from feed that is not suitable for other livestock species, so strategies to improve the efficiency of meat cows have focused on operational management and breeding. Among the other studies that dealt with sustainability is a study (Zorn, et al.,2018) in 2018 entitled Financial Ratios as Indicators of Economic Sustainability, a Quantitative Analysis of Swiss Dairy Farms, the study provided sustainability assessments that include financial ratios, taking into account the differences between European and North American practices and considering the prevailing sustainability assessment, The financial ratios frequently used were determined according to the sustainability rating developed by (Schader, et al.,2014). In 2019, (Daniele, 2019) tried to understand the

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relationship between sustainability, innovation and efficiency. In this research the main relationship between sustainability, innovation and efficiency was highlighted, as the importance of sustainability as a global goal for countries, companies and individuals emerges, stressing that it is not a short-term problem, it is primarily a long-term issue. In 2020, (Marlena, et al.,2020) presented a study on the path to sustainable agriculture and the ecological efficiency of Polish commercial farms, the research touched on the concept of eco-efficiency and its impact on overcoming the problems of negative agriculture on the natural environment by calculating the ecological efficiency of Polish commercial farms. In 2022, (Attia, et al.,2022) also studied the economic sustainability given diversity with sustainability assessment: Insights from the Walloon Bovine sectors, through which it aimed to assess the sustainability of small dairy farms in northern Tunisia, where sustainability scores were calculated, stressing that there is no disconnect between agro-ecological and socio-regional and economic sustainability, and therefore improvements must be made simultaneously at all three levels. In 2023, (Uğur, & Mehmet. 2023) wanted to see the impact of the project size on the sustainability of cow fields, in Samsun province, Turkey, based on the existence of global agricultural problems, and the use of methodology and indicators that have been developed to ensure the sustainability of various agricultural sectors. While focusing mainly on the study of sustainability at the farm level taking into account one year and environmental impact assessment only while neglecting the time representation of data (Dennis, et al.,2021). In 2023, (Stanley, et al.,2023) presented research on the assessment of the economic, environmental and social sustainability of impacts and competition on food, economic durability of dairy products and beef farming systems in Southwest Europe, the objective of this study is to assess the sustainability of livestock systems by combining life cycle sustainability assessment (LCSA) with assessment of feed competition Net profitability (P1):

and economic durability. In 2024, (Giuseppe, et al.,2024) presented research on sustainable livestock farming in the European Union, a study on beef farms in the NUTS 2 regions. This study focused on the balance between the importance of the beef industry and environmental sustainability, to identify and classify sustainable livestock farming models that reduce environmental pressure on renewable resources within the Union. In 2025, evaluated sustainable efficiency and calculated the sustainable value, opportunity cost and return on the cost of potato cultivation in Baghdad Governorate, along with (Chen, & Holden. 2018),(Grenz, et al.,200) (Hacking, & Guthrie. 2008) ,(Merle and Brown, 2006) (Zahm , et al., 2008).

MATERIALS AND METHODS

To achieve the objectives of the research and test its hypotheses, the data was obtained from its primary sources represented by a questionnaire, as 72 questionnaires were collected by personal interview from cow fields in Baghdad Governorate for the year 2023, including 25 fields from west Baghdad (Abu Ghraib), 20 fields south of Baghdad (Mahmoudiya), 17 fields from northern Baghdad (Tarmiya) and 10 fields from eastern Baghdad (Al-Madaen). Global assessment methods use three indicators to portray economic sustainability: profitability, liquidity, stability and in some studies solvency and repayment, and a set of quantitative ratios can be coordinated and grouped into the economic sustainability index. A set of quantitative ratios was coordinated and grouped into the Economic Sustainability Index. Absolute values were not taken, as was the use of qualitative criteria that are also widely used in assessing farm sustainability in mind. According to the classification of sustainability assessments developed by (Wheeling ,2008). As for the research method, it relied on the quantitative method by estimating a set of indicators, ratios and parameters for sustainability according to the following (Astrida, & Jurate. 2014) , (Wheeling, 2008) , (Zorn, et al., 2018) :

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$$\mathbf{P1} = \frac{\mathbf{farm\ net\ income\ [family\ farm\ income]}}{\mathbf{farm\ net\ income\ [family\ farm\ income]\ imputed\ cost\ of\ equity\ +\ imputed\ cost\ for\ unpaid\ labour}}$$

Return on assets (P2):

$$\mathbf{P2} = \frac{\mathbf{farm\ net\ income\ +\ interest\ paid\ -\ imputed\ cost\ for\ unpaid\ labour}}{\mathbf{farm\ investment}}$$

Return on equity (P3):

$$\mathbf{P3} = \frac{\mathbf{farm\ net\ income\ [family\ farm\ income]\ -\ imputed\ cost\ for\ unpaid\ labour}}{\mathbf{farm\ equity\ [net\ worth]}}$$

Income per family work unit (FWU) (P4):

$$\mathbf{P4} = \frac{\mathbf{farm\ net\ income\ -\ imputed\ costs\ for\ farm\ equipt}}{\mathbf{number\ of\ FWUs}} = \frac{\mathbf{earned\ income\ of\ all\ FWUs}}{\mathbf{number\ of\ FWUs}}$$

Operating profit margin ratio (P5):

$$\mathbf{P5} = \frac{\mathbf{farm\ net\ income\ +\ interest\ paid\ -\ imputed\ cost\ for\ unpaid\ labour}}{\mathbf{arm\ gross\ revenues\ +\ direct\ payments}}$$

Current ratio (L1):

$$\mathbf{L1} = \frac{\mathbf{current\ assets}}{\mathbf{current\ liabilities}}$$

Working capital-gross revenues ratio (L2):

$$\mathbf{L2} = \frac{\mathbf{working\ capital}}{\mathbf{gross\ revenues}}$$

Cash flow ratio (L3):

$$\mathbf{L3} = \frac{\mathbf{cash\ flow}}{\mathbf{turnover}}$$

Dynamic gearing ratio (L4):

$$\mathbf{L4} = \frac{\mathbf{farm\ liabilities}}{\mathbf{cash\ flow}}$$

Asset turnover ratio (FE1):

$$\mathbf{FE1} = \frac{\mathbf{farm\ turnover + direct\ payments}}{\mathbf{farm\ assets}}$$

Operating expense ratio (FE2):

$$\mathbf{FE2} = \frac{\mathbf{(total\ farm\ operation\ expense\ -\ depreciation\ expenses)}}{\mathbf{gross\ revenues}}$$

Depreciation expense ratio (FE3):

$$\mathbf{FE3} = \frac{\mathbf{depreciation\ expenses}}{\mathbf{gross\ revenues}}$$

Net farm income from operations ratio (FE4):

$$\mathbf{FE4} = \frac{\mathbf{net\ farm\ income\ from\ operations}}{\mathbf{gross\ revenues}}$$

Fixed assets-total assets ratio (S1):

$$\mathbf{S1} = \frac{\mathbf{fixed\ assets}}{\mathbf{total\ assets}}$$

Equity-fixed assets ratio (S2):

$$\mathbf{S2} = \frac{\mathbf{farm\ equity}}{\mathbf{fixed\ assets}}$$

Debt-equity ratio (S3):

$$\mathbf{S3} = \frac{\mathbf{farm\ liabilities}}{\mathbf{farm\ equity}}$$

Term debt and lease coverage ratio (RC):

$$\mathbf{RC} = \frac{\mathbf{capital\ debt\ repayment\ capacity}}{\mathbf{capital\ debt\ repayment\ capacity}}$$

Accordingly, the aggregate performance indicator will be γ where y represents economic sustainability, which is a sum of ratios based on four indicators, each indicator consists of at least four financial ratios, global assessment methods use three indicators to portray economic sustainability: profitability, liquidity and stability, and a set of quantitative ratios can be coordinated and grouped into an indicator of economic sustainability. Absolute values, as well as qualitative criteria that are also widely used in assessing farm sustainability, were not taken into account. According to the classification of sustainability assessments developed by him (Zorn, et al., 2018 , .Olson, 2010 ,.Schader, et al., 2014) :

$$Y = \left[\frac{(P1 + P2 + P3 + P4 + P5)}{5} + \frac{(L1 + L2 + L3 + L4)}{4} + \frac{(FE1 + FE2 + FE3 + FE4)}{4} + \frac{(S1 + S2 + S3 + RC1)}{4}\right] / 4$$

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RESULTS AND DISCUSSION

First: Indicators of the reality of raising cow: Before conducting a sustainability assessment, it is necessary to briefly review the most important indicators of cow breeding in Iraq or Baghdad and the sample in general, if it is noted that the number of cows according to the livestock survey in Iraq for the year 2008 and the adoption of 3% as a growth rate for the years after 2008. Note that this percentage is approved by the Ministry of Planning for the number of animals. Note that no accurate data for numbers are available due to the lack of up-to-date statistics as the last census was conducted in 2008. It is noted that in 2008 Iraq owned 2552113 cows distributed over the provinces of Iraq and reached the province of Baghdad 237977 cows one of the problems that occurred when collecting the numbers of cows is that there is no accurate agricultural census of the number of cows other than the 2008 census, and this is unacceptable, so how can planning and develop solutions without an accurate statistic, as well as the presence of other technical problems in raising cow, including the lack of natural pastures, so all animal food is fodder, whether concentrated or green, and due to the high prices of these feeds, the breeder does not use the optimal quantities of them, and this affects the productivity of the cow and the profits of the project, and the dependence on local breeds is weak productivity, as well as what Iraq was exposed to in 2014, represented by the lack of security stability, which led to a decrease in livestock, especially cow. Accordingly, the number of cows in 2023 in Baghdad province was 370,760 cows which constituted 9.85% of the total number of cows in Iraq. It is also noted that meat prices vary and vary from year to year, but from season to season, affected by some factors, including those related to religious occasions or the availability of rain and fodder, and this depends on the forces of supply and demand, and also there is demand that exceeds the level of supply. The market size for red meat in general is large and is growing at an expected rate of more than 106%. Among the other indicators through which the reality of cow breeding can be identified is the number of cow stations affiliated with the Ministry of Agriculture, which have been sold or leased to the private sector under investment contracts, which are projects dedicated to raising cows, which are considered as a design capacity of the largest projects in Iraq and the Middle East, but they are stopped working at present. The total number of stations reached 16 stations, of which 8 stations were sold to the private sector, 6 were leased stations belonging to the Ministry of Agriculture, and the remaining 2 stations belonged to Iraqi Arab companies (mixed sector). Explaining that the total design capacity of the above stations is 14,400 cows and the total operating capacity is 1,190 dairy cows. The total annual production of raw milk is 50,398 tons. It is also important to review the quantities of milk produced in Iraq, and it is noted that the quantities produced are in continuous growth, as the amount of milk in 2023 amounted to 3629.6 thousand tons. Milk collection centres are an essential pillar and vital artery for feeding the dairy industry, as they play an important role in ensuring the quality of milk and the continuity of supplies that contribute to providing safe and nutritious dairy products to the consumer, these centres receive milk from cow breeders to send it to the general company for dairy products of the ministry of industry and minerals, noting that most of these centres are suspended due to many problems, including breeders do not sell milk to these centres due to low prices and also for reasons of poor quality of milk produced and production capacity. There are a total of 37 milk collection centres in Iraq, of which 25 belong to the Ministry of Industry and Minerals and 4 to the Ministry of Agriculture are extension centres designed to raise awareness and train breeders on milk collection methods. Finally, the private sector has 8 centres, these centres sell milk to various dairy production plants spread in Iraq and belonging to the private sector. At the level of Baghdad province, there are 9 collection centres, which are the highest in Iraq, but a large part of them is not operating. The number of veterinary clinics in Iraq amounted to 253 dispensaries distributed over the various governorates in proportion to the presence of

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livestock, and the study population contains 21 dispensaries, from which it is clear that Iraq is a country trying to promote livestock by providing large numbers of dispensaries. But despite the importance of the availability and spread of dispensaries, the most important thing is the existence of veterinary programs and care carried out by these clinics and the existence of direct communication with breeders, whether confrontation or indirect communication. The sample contained 865 cows distributed over 72 fields in Baghdad province and the number of workers in these fields amounted to 662 individuals, including women and children, and this represents a family work that burdens the administration. As for the total costs, they amounted to 2058309.2 thousand dinars, of which variable costs represented 54%.

Table 1. Some indicators of cow breeding in Iraq and Baghdad Governorate and the research sample

Number of cows in Iraq	**3976109**
Number of cows in Baghdad province	370760
Number of cows in the sample	865
Cow stations of the Ministry of Agriculture	16
Prices of beef meat (dinars/ ton)	9381000
The amount of milk produced in Iraq (1000 tons).	3629.6
Milk collection Centers in Iraq	37
Actual feed requirements (corn, barley, bran) tons	3052391, 2335308, 2121147
Number of employees in the sample	662
Preparing veterinary clinics in Iraq	253
Preparation of veterinary clinics in Baghdad	21
Investment costs (thousand dinars)	2830901,8
Fixed costs (thousand dinars)	740609
Variable costs (thousand dinars)	1111249,2
Total revenues (thousand dinars)	6820981

Source: Ministry of Agriculture / Department of Animal Resources.
Department of Veterinary Medicine, Ministry of Planning, questionnaire

Assessing economic sustainability: Economic sustainability is the long-term validity of the fields, taking into account all opportunity costs, where there is an increasing number of sustainability measurements that cover the environmental, social and economic dimension and provide a comprehensive assessment of sustainability, where these assessments can be classified according to different criteria according to their main purpose, level of evaluation, geographical, sectoral and thematic scope, as well as sustainability perspective (Frater and Franks, 2013),(Kloepfer, 2008), This section dealt with the economic sustainability of different fields in the province of Baghdad by reviewing the feasibility of the fields and by focusing on the income of the agricultural family, where this analysis revealed that the sustainability analysis requires a detailed analysis to identify the weaknesses in the fields and financial ratios were also used as a starting point that provides a tangible basis for information to assess and improve the economic sustainability of the fields, the three indicators were used to portray economic sustainability (profitability, liquidity, stability and solvency) and other indicators deal with productivity and independence. Flexibility, (ability to pay and financial efficiency) and the local economy, the available data provide analysis of a subset of cow fields that allow the calculation of multiple means to facilitate the extreme annual value. As a first step, we divided the sample into three categories according to the number of cow, the small fields were 1-15 cow, the medium fields were 16-29 cow, and finally the large fields 30 cow and above, and 17 indicators were calculated for each category, which includes the first five indicators P1, P2, P3, P4, P5 to evaluate the profitability ratios, i.e. the ability of the field to achieve profit and are related to the ratios available by production factors such as total assets and employment through family consumption and total revenues from the field, where the higher these ratios, the better the level of performance in the field and this applies to all five profitability ratios the liquidity ratios L1, L2, L3, L4, which describe the ability of the field to meet its financial obligations, the higher the capacity of the field the better the financial efficiency ratios FE1, FE2, FE3, FE4, which aims to measure the extent to which financial resources are used to generate revenues, the higher the ratio of FE1, FE4 or the lower the ratio of FE2, FE3, the extent to which

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resources are used better in these fields, as for the stability and solvency ratios represented by S1, S2, S3, which refers to the ability of the field to stabilize after exposure to financial hardship, that is, the ability to continue production processes, and stability is considered as a feasibility for the field or is the ability to retain profitability and liquidity and that the terms stability and solvency are used in a similar context, and the higher S1, S2 or the lower S3, the better the field's ability to continue production operations, and finally the RC index, which represents the ability to repay ratio, which shows the field's ability to meet cash flow obligations.

First: Financial ratios according to the size of the project: For the nature of cow breeding in the province of Baghdad, as it falls within domestic or family breeding and not within commercial production, the sizes of projects and the number of cows in each project are important because they show the nature of breeding, and based on the foregoing, these percentages will be discussed according to these categories and as follows:

1. Small fields: (Table 2). shows the 17 indicators of the small fields showed that the indicators of profitability ratios were all positive, as they varied from one indicator to another, P1 amounted to 14.813, which indicates the capacity of the project and the possibility of the present value of cash flows from primary coverage, and this means that the net farm income was able to cover the costs of the family work ratio, and this means that these fields can compensate the paid-up field capital used in the production process, while the P2 index, which amounted to 2.154, indicates the ability of the project to achieve profits from assets and that the operational efficiency of the project and profitability is good, which means that investment in cow fields was able to generate net income that exceeded the working capital invested in it and the P3 index, which indicates the net wealth of the fields amounted to 0.563. Meaning, that the cow fields within this category can after deducting unpaid labour from covering the net value either P4 amount to 1.770, which is the income of each family business unit and is considered one of the important criteria for agricultural policy. It is a positive number that indicates good performance through economic governance, but it is weak due to the presence of a large number within this category, as it works in the fields of cow, children and women, and they are calculated to work that costs management large costs, and finally in the profitability ratios is P5, which amounted to 0.244 indicated the achievement of operational efficiency well, which is one of the ratios that are used in sustainability approaches, and the results also showed that the liquidity ratios that appeared positive in these fields, where the first the ratio of L1 is 23.838, which indicated the ability of the fields to meet current obligations and debts, the second ratio L2, which amounted to 0.531, and its results showed that the percentage of revenues is higher than the working capital of the projects, and the third ratio L3 was 3.285, which indicated the increase in the financial capacity of the fields, while the fourth ratio L4, which amounted to 0.920, describes the number of years required to pay project obligations, and the financial efficiency ratios FE1 It reached 0.845 and this showed that the turnover ratio of assets is high, i.e. the assets were used more efficiently, and the FE2 ratio reached 0.262, and this means that the project's production ratio to cover operating expenses is low, and this positively affects the efficiency of the field, and FE3 reached 0.269, which is the percentage of extinction expenses that appeared at a low rate, and this is better for the field, while FE4, which amounted to 0.528, indicated the high financial efficiency of projects by an average percentage, which is a high indicator due to the low stability in the cow fields and therefore The low cost of extinctions The stability ratios for this category were uneven, as S1 reached 0.798 and S2 about 230.791, which is the golden rule of balance sheets, which covered long-term assets through the rise in private capital, as S3 about 0.004 that the decrease in this ratio is evidence of the availability of capital to cover the debts of the project, and the ratio of repayment capacity was RC, which amounted to 6.059, this indicates the ability of the fields to generate enough cash to cover debt payments.

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2. Intermediate fields: The profitability ratios (P1, P2, P3, P4, P5) in the medium fields that had a holding of 16-29 cows amounted to 0.248, 1.394, 0.322, 0.475, and 5.180 respectively. All positive and greater than one and indicate the sustainability of the fields and the compensation of capital and that these fields have the ability to achieve profits in varying proportions, as they increased in P1, meaning that the net income ratio of the field was able to cover the costs of the family work ratio and the lowest percentage was in P5, which indicated the use of operational efficiency in an acceptable manner, and the liquidity ratios were high in L1, amounted to 17.172, that is a good indicator, as the higher the more it indicates the ability of the fields to meet current obligations and debts through assets in this category, and this means that the assets used in the fields of cow were able to cover current liabilities or working capital, and that L2, which amounted to 0.395, which is a low ratio, meaning that revenues were able to cover variable costs by 3%, L3 amounted to about 5.082 and L4 about 1.172, indicating the capacity of the financial fields, which is one of the good indicators of sustainability of cow fields, while the financial efficiency ratios FE1 amounted to 0.219 and this showed that the use of assets less efficiently due to the low asset turnover ratio and that FE2 amounted to 0.046 that the decrease in this ratio improves the efficiency of the field and this means an increase in the percentage of production in this category and was able to cover operating expenses, as it reached FE3 About 0.349, which is also a low ratio, i.e. the expenses of extinction are few, and this is better for the field, and FE4 was 0.671 and indicates the high net income to the total revenues, represent the financial efficiency of the project, and the three stability ratios varied in the results, reaching 0.875 S1 and S2 amounted to 60.778, which covered long-term assets through the rise in private capital, where the higher the capital, the better the performance of the field, either S3 It reached 0.003, which indicates the availability of capital to cover the debts of the project, where its decrease is positive for the field, and in this category, the ability to repay is low due to the lack of debt, where RC amounted to 0.008, when observing this criterion, RC note that this category of cow breeding fields could not generate enough cash to cover the debts, and this means a decrease in the debt coverage margin of 0.008 because this value is low for fields that do not have debts or have debts.

3. Large fields: The profitability ratios of the large fields were positive, except for the P3 index, where it reached -5.942, it is attributed to the presence of a large family work in this category, and this represents disguised unemployment that generates unpaid labour costs borne by the entrepreneur, negatively affecting the return index, and the liquidity ratios represented in L1, which amounted to 9.033, i.e. the field was able to meet current obligations and debts, and L2 amounted to 0.664 It showed that revenues are higher than variable costs, as L3 reached 6.023, which indicated the increase in the financial capacity of the fields and L4 about 9.171, and the financial efficiency ratios FE1 and FE4 (0.417 and 0.163) respectively, which are low but positive, affected the performance of the field well, while FE2 and FE3 amounted to (0.479 and 0.185) respectively. It is one of the ratios that whenever it decreases, the level of performance of the field improves, and the stability ratios in this category S1 reached 0.877, S2 amounted to 42.791 and S3 amounted to 0.005 that the decrease in this ratio is evidence of the availability of capital to cover the debts of the project and that the RC, which represents the ability to repay ratio reached 0, meaning there are no debts within this category, and the amount of RC low or zero because the fields have no debts, the denominator is zero and other ratios can be relied upon in this case. From the foregoing and when observing the financial ratios as economic indicators of sustainability in different fields of cow and according to sizes as shown in Table 2. We note that the indicators of financial ratios were the best in small fields, and this means that small fields are achieving higher net profitability and can cover their debts and compensate the capital used in the operation, while liquidity ratios in small fields achieved ratios in terms of L3 L2 L1 except L4 The second category 16-29 cows

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were the highest in terms of this indicator, which means that their obligations exceed their cash flow, while the indicators of financial efficiency agreed with the indicators of profitability, so they were the highest in small fields as well as stability indicators RC index as well. Therefore, it can be said that the fields of small cows (from 1 to 15 cows) are the most sustainable or more viable, taking into account the costs of alternative opportunities, although there are weaknesses within this category, this is due to the method of raising cow, as it is not commercial breeding, but limited to home breeding, and its costs depend on the availability of family work on the one hand or the availability of fodder from family farm projects on the other hand, as well as its infection with some diseases .

Table 2. Relative indicators of small, medium and large cow fields

Indicator	Value	cov	t	sig.
p1	11.254	10575.320	10.883	**
P2	1.541	1473.640	19.743	**
P3	-0.146	358.544	11.646	**
P4	2.292	1105.068	17.016	**
P5	0.227	161.784	17.763	**
L1	20.623	15460.440	13.546	**
L2	0.501	326.553	15.235	**
L3	3.960	2105.138	18.084	**
L4	1.764	566.976	10.719	**
FE1	0.620	544.815	20.062	**
FE2	0.197	161.171	13.627	**
FE3	0.304	165.382	14.244	**
FE4	0.545	336.724	20.103	**
S1	0.813	500.779	18.438	**
S2	168.691	144003.700	13.517	**
S3	0.004	2.286	15.851	**
RC	3.957	4221.050	12.868	**

Source: Prepared by authors using a questionnaire

Second: Indicators of the sample : Sustainability assessment is one of the many basic purposes for which financial ratios are used, and these ratios are also used to assess the risk of failure in field management, so the financial ratios were calculated at the level of a sample of cow fields in Baghdad Governorate and to review the feasibility of the fields, and we do not miss noting that these ratios in many of them focused on household income and the contribution of off-farm income to identify weaknesses in cow breeding, and when noting (Table 3).. (Figure 1) shows that the ratio of net profit and return on assets and operating profit margin was positive and greater than one, and it indicates that the cow fields in Baghdad province make a profit that they use production elements efficiently and that they cover the opportunity cost, and when linking the return to the total assets and the operating profit margin, we find that these fields achieved efficiency in operation, but the return on equity P3 was negative, as it achieved a value of -0.146, As well as income per unit of family work was positive, but smaller than the correct one and amounted to 0.227 and this may be attributed to the high family work in these fields, as there were about 662 individuals at the sample level and this work may be ineffective and calculated on work, especially children and women, as it contains a larger number of family work relative to the number of cows, as it reached 3 cows per 2 individuals (Awf, et al., 2024). To illustrate the extent of the difference between the averages, the heterogeneity values indicated that there were significant differences between the averages due to the large difference in the ratios of the account and indicators as well as the variation at the field level, and all these indicators were significant at the level of 1%. Liquidity ratios showed a clear increase in the L1 liquidity index, reaching 20.623, a clear indication that cow breeding fields can meet their financial obligations during the short term. Since the fixed assets and assets in the cow fields are weak and depend on traditional breeding, whether in terms of farming, milking or milk collection tools. Other liquidity ratios indicated that capital is better-used relative to the revenues generated from these fields and that they have the financial capacity and can meet obligations during the coming period through cash flow. There were also statistically significant differences and differences between different groups through heterogeneity values. When using ratios the four financial efficiency F1-F4 we see that it was low, but judging by these ratios, we see that the cow fields were efficient in terms of the field's production of milk and calves were able to cover operating expenses through FE2, which amounted to 0.197, and also were efficient through the FE3 ratio, which

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amounted to 0.304. As mentioned above, the assets in these fields are not large and therefore the costs of their extinction were not great either, so the cow fields were able to perform better here. Unlike European sources that distinguish between the areas of liquidity and stability, US sources differentiate between liquidity as short-term precautionary measures, while solvency refers to longer-term obligations, and when reviewing the stability and solvency ratios in the sample of cow fields in Baghdad Governorate 3S1-S, we see that the ratio of fixed assets to total assets amounted to 0.813, meaning that there is a kind of flexibility in these fields. The other ratios of 168.691 and 0.004 In order, they indicate that these fields have a degree of solvency and stability. Finally, the debt coverage ratio was greater than one at the level of cow fields, reaching 3.957,

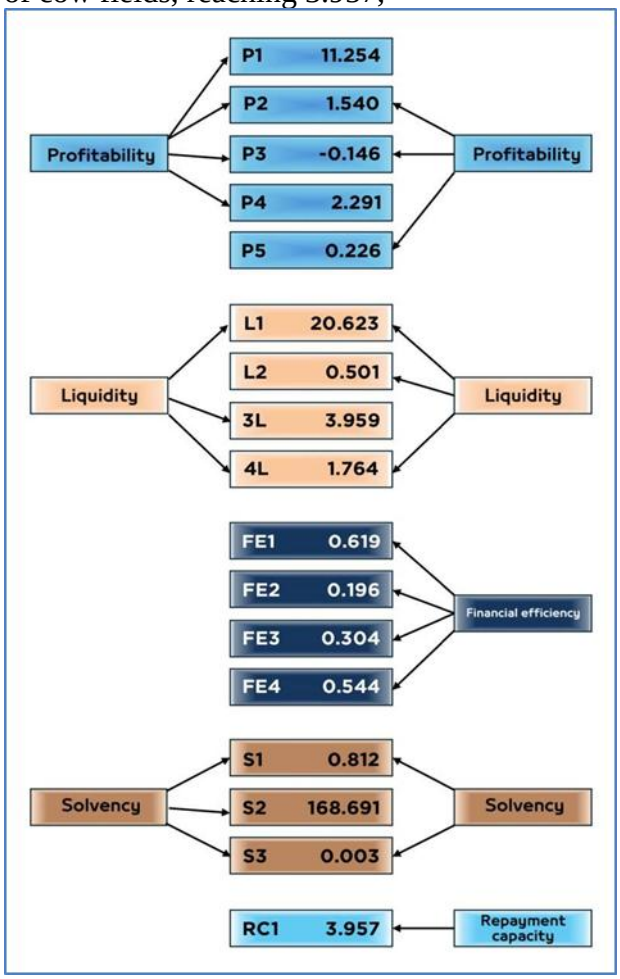

Figure 1. Standard financial ratios and their area of evaluation in the literature on farm management in Europe (left) and North America (right).
Resource: Zorn et al, 2018

showing the ability of projects to cover the debt. It should be noted here that the amounts of debt in the cow fields were low, and in some fields non-existent due to their dependence on self-financing. In general, there were statistically significant differences due to the existence of clear differences and changes between groups. Thus, it can be said that the cow fields in Baghdad province achieve sustainability through these ratios that they have long-term viability and that these ratios provided a sustainable economic evaluation of these fields. Although, we must be somewhat careful when reviewing these ratios for several reasons, including, that the financial success in the cow fields does not indicate the size of large commercial activity and scientific management. Instead, these projects are at the family level and depend on a large part of their costs on the family farm, the presence of a small number of cows with family agricultural projects and family work occurs a kind of integrated projects that appeared positively and sustainably ratios and indicators used these on the one hand, and the other hand some paragraphs of financial ratios may not be available or compatible with the nature of production in Iraq, such as property rights and agricultural shares.

Table 3. Financial ratios and indicators at the level of cow sample in Baghdad Governorate

Indicator	Value	Cov.	*t*	sig.
P1	11.254	10575.320	10.883	**
P2	1.541	1473.640	19.743	**
P3	-0.146	358.544	11.646	**
P4	2.292	1105.068	17.016	**
P5	0.227	161.784	17.763	**
L1	20.623	15460.440	13.546	**
L2	0.501	326.553	15.235	**
L3	3.960	2105.138	18.084	**
L4	1.764	566.976	10.719	**
FE1	0.620	544.815	20.062	**
FE2	0.197	161.171	13.627	**
FE3	0.304	165.382	14.244	**
FE4	0.545	336.724	20.103	**
S1	0.813	500.779	18.438	**
S2	168.691	144003.700	13.517	**
S3	0.004	2.286	15.851	**
RC	3.957	4221.050	12.868	**

**** significant at 1%.**
Source: Calculated by Authors using the questionnaire.

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Third: Correlations between financial ratios

To find out whether there is a synergistic relationship between the financial ratios and whether these ratios are affected among them. Spearman's correlation analysis (rank correlation) was performed to determine the nature of the correlation between these indicators, as shown in (Table 4). We notice that the profitability ratios varied in correlation between them and other financial ratios, so the best positive relationship between P1 and FE4, which amounted to 0.73, indicates a synergistic relationship between the two ratios, it may be attributed to the nature of the two indicators, and this is fully consistent with the economic or financial logic because the ratio of net profitability and net income from the operating ratio depends in their simplification on net income as an important indicator to measure profitability and employment ratio, and at the same time the better the economic performance, the greater the proportion of these indicators. The weakest correlation for P1 was with S3, which amounted to 0.029 which may be because each ratio adopts different indicators from the other, for example, the net profitability ratio gives a great deal of importance to the family farm income, while S3 gives a greater amount to the debt ratio, while the strongest correlation between the profitability index ratios was between net profitability P1 and P4, where it reached 0.11, and this gives us an important indication of the improvement of profitability in the fields of cow. The correlations between the liquidity ratios related to the ability of the fields to meet their financial obligations were mostly weak and did not indicate a strong relationship except for the relationship between L1 and L2, which amounted to 0.61, 0.51, while with the other financial ratios, there was a strong negative relationship between the liquidity ratio and the financial efficiency ratio L1 and FE1, which amounted to -0.72. The commonality between them is the assets used in breeding cow fields in the province of Baghdad, and the most important asset is the value of the cow and the cost of building the barns, while the rest of the assets are of a weak contribution because the breeding of cow in the province does not adopt technical and modern methods in breeding, but rather depends on home breeding. When observing the correlations between the ratios of the financial efficiency index, we noticed the strongest positive correlation between the percentage of asset turnover and the percentage of extinction, as Spearman's correlation coefficient with them was 0.66 with a reference the highest correlation between the stability ratios and other financial indicators was between the liquidity ratio and the asset turnover ratio, as the correlation coefficient between them was very strong and significant and amounted to 0.96, stressing the importance of this relationship and the synergistic nature between the two indicators. While weak and insignificant relationships appeared between the debt coverage ratio and other financial ratios, this confirms the weak importance of this indicator because the debt was low in the cow fields in Baghdad province and most breeders rely on self-financing.

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Table 4. Spearman's correlation of ranks between financial ratios

		p1	P2	P3	P4	P5	L1	L2	L3	L4	FE1	FE2	FE3	FE4	S1	S2	S3	RC
p1	Correlation Coefficient	1	.713**	.567**	-.111-	.843**	-.146-	-.783-**	.684**	-.395-**	.483**	-.187-	-.648-**	.733**	-.175-	0.154	0.029	0.098
	Sig. (2-tailed)	.	0	0	0.349	0	0.218	0	0	0.001	0	0.113	0	0	0.138	0.192	0.81	0.409
P2	Correlation Coefficient	.713**	1	.266*	-.013-	.683**	-.445-**	-.673-**	.614**	-.310-**	.783**	0.001	-.867-**	.635**	-.469-**	.542**	0.003	0.09
	Sig. (2-tailed)	0	.	0.023	0.91	0	0	0	0	0.008	0	0.995	0	0	0	0	0.977	0.451
P3	Correlation Coefficient	.567**	.266*	1	-.084-	.467**	-.166-	-.346-**	.288*	-.734-**	.294*	-.026-	-.377-**	.298*	-.143-	-.010-	0.117	0.031
	Sig. (2-tailed)	0	0.023	.	0.479	0	0.162	0.003	0.014	0	0.012	0.825	0.001	0.011	0.228	0.931	0.324	0.797
P4	Correlation Coefficient	-.111-	-.013-	-.084-	1	-.157-	-.436-**	.334**	.343**	.272*	0.127	.470**	-.153-	-.375-**	-.451-**	0.058	.508**	0.029
	Sig. (2-tailed)	0.349	0.91	0.479	.	0.184	0	0.004	0.003	0.02	0.283	0	0.196	0.001	0	0.629	0	0.808
P5	Correlation Coefficient	.843**	.683**	.467**	-.157-	1	-.017-	-.869-**	.506**	-.527-**	.400**	-.313-**	-.580-**	.807**	-.010-	0.026	-.146-	.234*
	Sig. (2-tailed)	0	0	0	0.184	.	0.889	0	0	0	0	0.007	0	0	0.933	0.83	0.217	0.046
L1	Correlation Coefficient	-.146-	-.445-**	-.166-	-.436-**	-.017-	1	-.180-	-.514-**	-.197-	-.724-**	-.768-**	.704**	.234*	.982**	-.605-**	-.581-**	.373**
	Sig. (2-tailed)	0.218	0	0.162	0	0.889	.	0.128	0	0.095	0	0	0	0.046	0	0	0	0.001
L2	Correlation Coefficient	-.783-**	-.673-**	-.346-**	.334**	-.869-**	-.180-	1	-.420-**	.616**	-.265-*	.553**	.463**	-.986-**	-.187-	-.012-	.331**	-.251-*
	Sig. (2-tailed)	0	0	0.003	0.004	0	0.128	.	0	0	0.023	0	0	0	0.113	0.923	0.004	0.032
L3	Correlation Coefficient	.684**	.614**	.288*	.343**	.506**	-.514-**	-.420-**	1	-.037-	.450**	0.201	-.659-**	.361**	-.526-**	.295*	.355**	-.108-
	Sig. (2-tailed)	0	0	0.014	0.003	0	0	0	.	0.755	0	0.088	0	0.002	0	0.011	0.002	0.362
L4	Correlation Coefficient	-.395-**	-.310-**	-.734-**	.272*	-.527-**	-.197-	.616**	-.037-	1	-.116-	.440**	0.216	-.602-**	-.218-	0.117	.246*	-.255-*
	Sig. (2-tailed)	0.001	0.008	0	0.02	0	0.095	0	0.755	.	0.33	0	0.066	0	0.064	0.324	0.036	0.03
FE1	Correlation Coefficient	.483**	.783**	.294*	0.127	.400**	-.724-**	-.265-*	.450**	-.116-	1	.435**	-.864-**	0.202	-.750-**	.558**	.308**	-.043-
	Sig. (2-tailed)	0	0	0.012	0.283	0	0	0.023	0	0.33	.	0	0	0.086	0	0	0.008	0.716
FE2	Correlation Coefficient	-.187-	0.001	-.026-	.470**	-.313-**	-.768-**	.553**	0.201	.440**	.435**	1	-.329-**	-.594-**	-.773-**	.271*	.667**	-.312-**
	Sig. (2-tailed)	0.113	0.995	0.825	0	0.007	0	0	0.088	0	0	.	0.005	0	0	0.02	0	0.007
FE3	Correlation Coefficient	-.648-**	-.867-**	-.377-**	-.153-	-.580-**	.704**	.463**	-.659-**	0.216	-.864-**	-.329-**	1	-.399-**	.692**	-.488-**	-.299-*	0.12
	Sig. (2-tailed)	0	0	0.001	0.196	0	0	0	0	0.066	0	0.005	.	0	0	0	0.01	0.312
FE4	Correlation Coefficient	.733**	.635**	.298*	-.375-**	.807**	.234*	-.986-**	.361**	-.602-**	0.202	-.594-**	-.399-**	1	.241*	0.018	-.395-**	0.219
	Sig. (2-tailed)	0	0	0.011	0.001	0	0.046	0	0.002	0	0.086	0	0	.	0.04	0.882	0.001	0.063
S1	Correlation Coefficient	-.175-	-.469-**	-.143-	-.451-**	-.010-	.982**	-.187-	-.526-**	-.218-	-.750-**	-.773-**	.692**	.241*	1	-.630-**	-.599-**	.333**
	Sig. (2-tailed)	0.138	0	0.228	0	0.933	0	0.113	0	0.064	0	0	0	0.04	.	0	0	0.004
S2	Correlation Coefficient	0.154	.542**	-.010-	0.058	0.026	-.605-**	-.012-	.295*	0.117	.558**	.271*	-.488-**	0.018	-.630-**	1	-.147-	-.201-
	Sig. (2-tailed)	0.192	0	0.931	0.629	0.83	0	0.923	0.011	0.324	0	0.02	0	0.882	0	.	0.215	0.089
S3	Correlation Coefficient	0.029	0.003	0.117	.508**	-.146-	-.581-**	.331**	.355**	.246*	.308**	.667**	-.299-*	-.395-**	-.599-**	-.147-	1	-.233-*
	Sig. (2-tailed)	0.81	0.977	0.324	0	0.217	0	0.004	0.002	0.036	0.008	0	0.01	0.001	0	0.215	.	0.048
RC	Correlation Coefficient	0.098	0.09	0.031	0.029	.234*	.373**	-.251-*	-.108-	-.255-*	-.043-	-.312-**	0.12	0.219	.333**	-.201-	-.233-*	1
	Sig. (2-tailed)	0.409	0.451	0.797	0.808	0.046	0.001	0.032	0.362	0.03	0.716	0.007	0.312	0.063	0.004	0.089	0.048	.

Source: Calculated by authors using the SPSS program

Fourth: Correlations between indicators : (Table 5). shows Spearman's correlation of ranks between the four indicators (combined financial ratios) which is calculated by taking a weighted average for each indicator. It was also found that its correlations are partially weak, as the compiler index of financial efficiency shows the strongest correlation with stability with a correlation coefficient of 0.580, and this may be due to the fact that the two indicators depend heavily on revenues and assets, which made them a relatively strong correlation, and also notes correlation between the liquidity index and the stability index amounted to -0.531 significant at the level of 5%, because the two indicators depend on some of their financial ratios on revenues as well as assets, and the weakest correlation reached -0.033 between the liquidity index and the net profitability index, but in terms of significance, we note that the profitability index P was not significant with other indicators, except for the financial efficiency index, it was significant at the level of 1%, while the liquidity index L was significant at the level of 1% with the financial efficiency index and the stability index, while the financial efficiency index FE was significant with all indicators at the level of 1% except for the ability to pay index.

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Table 5. Spearman's correlation between the indicators (combined financial ratios) of the sample

Correlations							
			P	L	FE	S	RC
Spearman's rho	P	Correlation Coefficient	1.000	-.033-	354**	.175	.067
		Sig. (2-tailed)	.	.784	.002	.141	.578
	L	Correlation Coefficient	-.033-	1.000	-.449-**	-.531-**	.172
		Sig. (2-tailed)	.784	.	.000	.000	.149
	FE	Correlation Coefficient	354**	-.449-**	1.000	580**	-.219-
		Sig. (2-tailed)	.002	.000	.	.000	.064
	S	Correlation Coefficient	.175	-.531-**	580**	1.000	-.239-*
		Sig. (2-tailed)	.141	.000	.000	.	.043
	RC	Correlation Coefficient	.067	.172	-.219-	-.239-*	1.000
		Sig. (2-tailed)	.578	.149	.064	.043	.

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Source: Calculated by authors using the SPSS program

Fifth: Aggregate Performance Indicators : (Table 6). contains the aggregate performance indicators y, which was grouped by 17 financial ratios calculated according to equation 18, in addition to that, the table contains ZA, which is the American aggregate indicator, ZE, the European aggregate index, and the average values of the ratio indicators for the quarters (P, L, FE, S/R) and all the 17 ratios indicators, where the table was divided into four groups according to performance, and the groups were divided based on the aggregate performance indicator and its correlation with other indicators and not (the index with the same), where the variation of the aggregate index in the first quarter or the poorly performing field (Quarter Y1) amounted to 3.459 and in the fourth quarter or the well-performing field (Quarter Y4) amounted to 168.691, and the next column shows the range between the first and fourth quartiles of the variable y, which is 165.23, where a varying pace of values appears, there are increasing values and low values in the performance of the groups, and this means that the fourth group in the fields with high or good performance does not contain the highest value of all indicators, where 11 indicators of 17 were increasing from the first quarter to the fourth quarter and the highest range in the S2 indicators amounted to 643.27 and the lowest differences in S3 amounted to 0.002, it also contains 6 indicators that were incompatible with performance are (P4, L1, L2, L4, FE3, S1), the European aggregate index ZE, which represents the left side of the Figure 1. was calculated according to the law (P×3L×3S4) and the results showed that the percentage of ZE in the poor performance according to the divisions of the index Y amounted to 14139.178 and for the category with good performance amounted to 233227.765, while the American total index ZA, which represents the right side of the figure and through the law (3P×3L×4FE×2S/RC), the index was calculated, with the highest value of ZA in the Good Performance category of 0.382 and the poor performance of 152.612. An agricultural system is sustainable at the farm level if it meets the needs of the farm manager while conserving natural resources. Resource conservation is treated separately from farmer satisfaction, and there are two possible ways to identify and measure sustainable agriculture, one is based on the principle that important indicators of sustainability are site-specific and change with the prevailing situation on the farm, and the other approach is based on the principle that the definition and procedure for measuring sustainable agriculture is the same regardless of the diversity of attitudes prevailing in different farms. It can measure sustainability at the farm level by: defining sustainability requirements, selecting a common set of indicators, and setting threshold levels. Sustainability is also measured by converting indicators to a sustainability index (Maddock ,et al .,2010). It must be understood that the efficiency of raising cows is a topic of great importance to many researchers and producers of purebred breeds. There are many ways to measure efficiency, including different selection indicators, but each producer needs to be

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aware of what needs to be measured to provide a clear picture of the efficiency of its specific processes. Producers who understand the nutritional needs of the cow herd relative to reproductive status will be the production stage will be able to make sound decisions that will increase efficiency and thus profit (Maddock,et al.,2010).

Table 6. Overall indicators, average scores of performance groups, core indicators and financial ratios

Indic.	Quarte Y1	Quarter Y2	Quarter Y3	Quarter Y4	Range QY1–QY4
Y	3.459	10.567	26.689	168.691	165.232
ZA	152.612	0.350	5.955	0.382	152.230
ZE	14139.178	3624.250	14980.745	233227.765	219088.586
P	19.195	6.748	11.961	45.315	26.120
L	102.470	19.216	12.161	10.175	92.295
FE	1.341	0.911	1.104	2.661	1.320
S/RC	23.896	46.423	31.867	35.279	11.384
p1	21.006	3.109	8.140	35.379	14.373
P2	0.278	0.251	1.220	7.572	7.294
P3	-4.006	-0.097	0.809	0.794	4.800
P4	1.861	3.481	1.724	1.473	0.389
P5	0.275	0.018	0.335	0.485	0.209
L1	99.915	14.854	6.472	3.600	96.315
L2	0.612	0.565	0.453	0.343	0.270
L3	0.460	3.355	5.060	6.000	5.539
L4	5.929	1.767	0.701	0.933	4.997
FE1	0.617	0.223	0.504	2.147	1.530
FE2	-0.016	0.225	0.220	0.307	0.322
FE3	0.628	0.340	0.233	0.036	0.592
FE4	0.450	0.487	0.587	0.687	0.236
S1	0.952	0.867	0.794	0.568	0.384
S2	12.324	40.505	102.713	655.596	643.272
S3	0.004	0.005	0.003	0.003	0.002
RC	0.556	0.891	3.248	18.599	18.044

Source: Calculated by authors based on the results of the indicators and the questionnaire

CONCLUSION

Economic sustainability is long-term competitiveness and profitability, and from a financial point of view, an economic unit must be sufficiently capable of meeting long-term needs. This means that economic sustainability is one of the three dimensions of the results, and perhaps the most attractive and popular dimension of sustainability is the long-term view of the organization in terms of financial and marketing measures. For the project to continue, it must have the ability to provide income for the family over a long period. There is therefore a continuous and growing need to assess the objectives of the Common Agricultural Policy and the European Rural Development Programmed such as improving agricultural feasibility. Therefore, this research has adopted a measure of the income of agricultural households that provides details on the income levels of agricultural households, which can be analyzed and evaluate their economic sustainability using a wide range of ratios and financial indicators and shed light on the differences in their application. The research concluded that the use of the quantitative method of economic sustainability is important and provides an incentive for educators and decision-makers to know the weaknesses and work to strengthen them, and the research concluded that sustainability indicators must be included when conducting the financial evaluation so that the validity of the field and its feasibility can be judged after a while. Likewise, each country has special circumstances that may differ from the countries in which these indicators have been approved. Therefore, some of the percentages applied, whether in America or Europe, may not be applied in Iraq because of the data or they are not suitable for animal production projects such as agricultural stocks and property rights, and this leads us to distinguish between whether the feasibility or sustainability of the project is a measure of opportunity cost, as in European literature, or

is it a measure of family well-being, as in American research, and one of the other important conclusions of the research is that small fields have achieved positive indicators that make them more sustainable, due to the small size of the projects and their reliance on family work as an alternative opportunity and the provision of fodder from the family farm. The lack of accurate statistics on livestock, especially cows, makes it difficult to formulate successful agricultural policies and determine the optimal quantities of production elements necessary to develop this important part of animal production. Accordingly, the research recommends the need to evaluate economic sustainability through a set of indicators and come up with a cumulative indicator of performance and not be satisfied with certain percentages. It is important to provide financial support to field owners so that they can buy cows of known breeds with high productivity and provide feed of all kinds and in recommended quantities. Agriculture departments should implement an annual veterinary program and give all immunizations and preventive vaccines to enhance productivity.

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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.

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تقييم الاستدامة الاقتصادية لحقول الابقار في محافظة بغداد للعام2023

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المستخلص

هدف البحث الى تقييم الاستدامة الاقتصادية لمشاريع الابقار في إطار شامل يأخذ الابعاد الاقتصادية والاجتماعية في الاعتبار، تركز مشكلة البحث على تربية الماشية في المناطق الهامشية ذات المناخ القاسي، بما في ذلك درجات الحرارة المرتفعة وانخفاض هطول الأمطار، مما يؤدي إلى قلة موارد الرعي المحدودة والظروف السيئة. غالبا ما تهمل المزارع التي تديرها الأسرة الإدارة العلمية، مما يؤدي إلى انخفاض الأداء الاقتصادي والاستدامة. وبالتالي، فإن القيمة المضافة من هذه العمليات ضئيلة. تم جمع البيانات من 72 مزرعة ماشية في محافظة بغداد في عام 2023. تم استخدام مناهج التقييم العالمية اربعة مؤشرات لتصوير الاستدامة الاقتصادية هي الربحية والسيولة والاستقرار والملاءة والسداد، اي حسبت 17 نسبة مالية ضمن هذه المؤشرات، تبين منها ان نسب الربحية جاءت جميعها موجبة، لكنها تباينت من مؤشر الى اخر، في الحقول الصغيرة بلغ P1 14.813 والذي يشير الى قدرة المشروع وإمكانية القيمة الحالية للتدفقات النقدية من التغطية الأولية، اما في الحقول المتوسطة فكانت نسب السيولة مرتفعة في L1 التي بلغت 17.172 وهي مؤشر جيد حيث كلما ارتفعت كلما دلت على قدرة الحقول على الوفاء بالالتزامات والديون الحالية من خلال الاصول هذه الفئة، نسب الاستقرار في الحقول الكبيرة بلغت فيها S1 0.877 وS2 بلغت 42.791 وS3 بلغت 0.005 أن انخفاض هذه النسبة دليل على توفر رأس مال لتغطية ديون المشروع، أي لا يوجد أي ديون ضمن هذه الفئة، تم حساب مؤشر الاداء التجميعي، وحساب ZA وهو المؤشر الكلي الامريكي وZE المؤشر الكلي الأوربي، قسم الحقول الى اربع مجاميع حسب الأداء، حيث تباين المؤشر التجميعي في الربع الاول او الحقل ضعيف الاداء (Quarter Y1) بلغ 3.459، وفي الربع الرابع أو الحقل جيد الاداء (Quarter Y4) بلغ 168.691، استنتج البحث انه يجب تضمين مؤشرات الاستدامة عند اجراء التقييم المالي حتى يمكن الحكم على صلاحية الحقل وجدواه بعد مدة زمنية، كذلك بعض النسب المطبقة في امريكا او اوروبا قد لا يمكن تطبيقها في العراق، بسبب البيانات او انها غير ملائمة لمشاريع الانتاج الحيواني، مثل الاسهم الزراعية وحقوق الملكية، وهذا يقودنا للتمييز بين هل الجدوى او استدامة المشروع مقياس لتكلفة الفرصة البديلة، كما في الادبيات الاوربية، او هي مقياس لرفاهية الاسرة كما في البحوث الامريكية.

الكلمات المفتاحية: الضغوط البيئية، إدارة المزارع، صلاحية المزرعة، النسب المالية، طريقة RISE.