



Economic Study of the Comparative Advantage and Competitiveness of Small Holdings for Fattening Cows Calves in Nineveh Governorate for the Year 2018

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Abstract: The study aims to measure the comparative and competitive advantage of red meat production in the Kokjali region of Nineveh through some measures derived from the policy analysis matrix. The study relied on the primary data collected through the questionnaire form for a random sample of (100) fields included (5610) imported calves in the Kokjali district of Nineveh Governorate for the production year 2018. The sample was distributed into three categories according to the number of calves. The sample was divided into three categories, according to the number of calves, the first category of fields contains 25-49 calves and their number reached 35 fields, and the second category represents fields that contain 50-74 Calf has reached 48 fields, and the third category represents the fields that contain 75 calves or more and reached 17 fields. The results of the study indicated that the measures of protection and indicators of comparative advantage showed that there is no government support to protect red meat production in the domestic market for the year 2018 and this is clear from the nominal protection coefficient of the outputs 0.263. The same is the case with the nominal protection coefficient of inputs 1.212, as the results of the study showed that there is no government support. In addition, the measure of the special costs ratio indicated that the red meat product system has international competitiveness 0.004. Finally, the value of the local resource cost factor 0.131 indicated that the Kokceli area has a comparative and competitive advantage for the production of red meat, as the coefficient appeared to be less than the correct one.

Keywords: Price matrix, Comparative advantage, Red meat, Efficiency criteria.

Introduction

The food problem is one of the most important problems facing the structure of the Iraqi economy, and at a time when food has become an economic and political force and a weapon that countries and economic blocs are defaming against each other, the trend

towards achieving a kind of strategy in achieving food security has become one of the main pillars of the agricultural production sector, both plant and animal, especially Livestock projects that are undergoing a massive transformation fuelled by high demand for meat and likely to double in the

near future, behind which major powers stand, a mixture of population growth, urbanization and income growth (ESCWA, 2019). The success of these projects will be directly reflected in increasing the national product, increasing the income of individuals and production better by providing various animal products (Kulibaba *et al.*, 2021). The most important of them are red meat, especially beef calves, which are the main source of fattening projects and fields for the private sector in all regions of Iraq, and these projects are rewarding compared to other animal and agricultural projects, as calves can convert large quantities of herbs and green and dry plants and cheap grains into expensive products.

The price is of high protein content like meat which contains 17% of it. Hence the need for attention to this issue emerged through studying the effect of agricultural price policy on red meat production through its effect on resource use efficiency by using the policy -analysis matrix for this important strategic commodity. We were able to calculate this matrix by calculating nominal and effective protection factors and then get to know the policy followed by the state, whether it is a protectionist policy or a policy of imposing taxes directly or indirect taxes on the producers of this commodity (Faraj *et al.*, 2020). Also, calculate the cost factor of domestic resources to determine the comparative and competitive advantage.

Objective

The objective of this study is to measure some indicators derived from the policy analysis matrix of red meat in the Kokjali region of Nineveh Governorate for the production year 2018 and to determine the private and social profitability of the product and the comparative advantage parameters of

this commodity to reach a calculation of the efficiency and profitability of local production in relation to the imported product, as well as a conclusion of the extent of the competitiveness of local production At the global level and the possibility of continuing or leaving local production and relying on external import based on the value of the local resource cost factor (the comparative advantage factor).

Importance

Calves production is important in Nineveh Governorate, particularly in the Kokjali region, since it is regarded as a basic source of food for individuals as well as a source of energy and income. Furthermore, after sheep, it is the second most common form of red meat.

The Problem

The Iraqi economy is open to the global economy and means the challenges of global trade, so priority must be given to encouraging competition in the economy. Therefore, the production and fattening of calves in Iraq must depend on the comparative advantage in the use of local resources, including the optimal use of natural resources.

Materials & Methods

Methods of descriptive and quantitative analysis were used for the phenomena under study, estimating nominal and actual protection factors and the cost of local resources for red meat production for the year 2018. In addition, an analysis of the policy matrix and measuring the cost of local resources and financial and economic profitability of farms, the research mainly relied on cross-sectional field data collected through a questionnaire form for the breeding and fattening fields of veal calves in the

region of Kokjali in Nineveh Governorate for the production year 2018. Where the data collection process was done in a personal interview with the farmers raising the calves, and a random sample was taken of 100 fields that included 5610 imported calves. The sample was divided into three categories according to the numbers of calves, the first category of fields contains 25-49 calfs and reached its number is 35 fields, and the second category represents fields that contain 50-74 calfs and has reached 48 fields, while the third category represents fields that contain 75 calfs or more and has reached 17 fields. The data was entered, sorted and tabulated electronically on the computer through the data and information in the questionnaire.

Policy Analysis Matrix (PAM)

The Policy Analysis Matrix is a modern method of policy analysis (Tsakok, 1990). Its importance lies in its ability to examine the effective impact of government intervention policies at all stages of commodity flow from producer to domestic wholesale and export (Saad *et al.*, 2019). It helps to measure the efficiency of these policies in achieving their goals and examining their effects on producers, consumers and the overall economy (Emam & Hassanain, 2018). And an estimate of the distortions that may occur in the (external) market. Using the matrix, the following can be estimated:

A- Product Competitiveness (Competitiveness) (Mohammed & Mudhi, 2016).

B-Effective and efficient use of resources and inputs.

C- Conversions the difference between distorted real prices and social prices, which

are called economic, efficiency, or effectiveness prices.

D-Comparative advantage.

Building an policy analysis matrix

The ARP matrix is based on the farm budget based on revenue and costs (Mehta *et al.*, 2020) and divides the costs into two types:

A-Tradable production inputs: These are inputs that can be traded and for which international prices are available. Also, the CIF price and the FOB price are used to calculate their social prices.

B-Local resources: elementary elements of production are considered to have no international prices and their economic or effectiveness prices are calculated on the basis of the cost of alternative opportunities or shadow prices, i.e. the return in the case of using the alternative, while evaluating this production from alternative use at the border prices (fob or sword price), The return and profit or costs are calculated both times at the market price and again at the economic price, and the difference between them is called transfers, and the volume of transfers reflects the extent of the deviation of different special prices, as a result of social prices.

What is meant by transfers: Taxes or subsidies are included only in special prices and are not included in social prices because they are not part of the production cost, that is, they do not have alternative opportunities.

The concept of economic profits is an integral part of the policy analysis matrix (Gürer, 2020). Profit is defined as the difference between outputs (revenues) and costs of all inputs (costs) (Pearson *et al.*, 2004). Table (1) shows the general matrix model Policy analysis.

Table (1): Policy Analysis Matrix Structure.

	Revenue	Tradable inputs	local resources	Profits
Special prices	A	B	C	D
Social prices	E	F	G	H
Transfers	I	J	K	L

The first row of the matrix represents private special prices, the local prices of the commodity system for both gross return A and traded inputs B, cost of local resources C, and special profits D. As for the second row, the social prices represent the shadow prices for both the total return E and the cost of the inputs traded F and the cost of local resources G and social profits H. While the third row represents transfers the effect of the intervention policy and the market failure and includes the transfers of output I which is the difference between the local price and the social price of output ($I = A - E$).

As for the conversions of the cost of inputs traded with J, which is the difference between the cost of inputs traded with it at the local market price and its cost in the social price ($J = B - F$) and for the transfers of local resources K, which is the difference between the prices of local resources at the market price and its social price ($K = C - G$). Net transfers L represent the effects of government intervention policy and market failure on the commodity system $L = (D - H)$ or $(I - J - k)$.

Private profitability: Special profitability D is the difference between the total sum of revenue A or per unit sold and production costs (Mudhi & Mohammad , 2012) which - includes the sum of the input costs traded B and the local resources C per unit of output

and can be obtained according to the following formula : $D = (A - B + C)$ or $(A - B - C)$.

Social profitability: Social profitability is the difference between revenues and costs traded and local and valued at social prices and can be obtained according to the following formula:

$$H = (E - F + G) \text{ or } (E - F - G)$$

Efficiency and Economic Competitiveness Standards (Elsamie *et al.*, 2020)

1- (NPC0) Nominal Protection Coefficient: This measure defines the actual difference between domestic and international prices and explains the effect of the policy on the price of the product (Subedi *et al.*, 2020) by dividing revenue at special prices by revenue at social prices and is calculated according to the following formula:

$$NPC0 = \frac{A}{E}$$

Whereas: NPC= Nominal Protection Coefficient, A = Revenue at Special Prices, E = Revenue at Social Prices.

A-If the value ($NPC0 > 1$) means that the special prices for the outputs are higher than the border prices and this explains the existence of a financial subsidy for the producers, i.e. farmers get a higher profit if the commodity trade is free .

B-If the value of ($NPC0 < 1$), this means that the special prices for the outputs are lower than the border prices, and this explains the

presence of taxes on commodities, meaning farmers receive less profit if the commodity trade is free.

C-Either if the value ($1 = NPC_0$) indicates that there is no government intervention in commodity prices and that there is no market failure (Ahmed, 2019).

1-(NPC_i) The nominal protection coefficient of tradable inputs: This parameter shows the actual difference between domestic and international prices for tradable materials and explains the policy impact on the price of those resources by dividing the value of tradable materials at special prices by their value in social prices and calculated according to the following formula:

$$NPC_i = B/F$$

Whereas: NPC = nominal protection coefficient of tradable materials, B = tradable input value at special prices F = tradable input value at social price.

A-If the value of ($NPC_i > 1$) this means that there are taxes imposed on the materials and then the producers pay a price for these materials with a greater value if their trade is free.

B-If the value of ($NPC_i < 1$) this means that the producers obtain financial subsidies by purchasing production requirements at a lower price if their trade is free.

C-If the value ($1 = NPC_i$), this indicates that there is no government intervention in the prices of these materials.

1-Effective Protection Factor (EPC): This parameter shows the net effect of the policy on outputs and inputs and is a more clear measure of the impact of the policy and is calculated according to the following formula:

$$EPC = A - B/E - F$$

Whereas: EPC = actual protection coefficient, A = revenue at private prices, B = costs of tradable materials at special prices, E =

revenue at social prices, F = costs of tradable materials at social prices.

A-If ($EPC > 1$), this means that the overall effect of the policy results indicates a positive incentive for this policy.

B-If ($EPC < 1$), this means that the overall effect of the policy results indicates negative incentive effects.

C-If it is ($1 = EPC$), this indicates that there is no government interference or that the net effect of the different policy measures imposed on both tradable materials and outputs is equal to zero.

3-Domestic Resource Cost Factor (DRC): This measure shows the efficiency of using local resources in producing agricultural crops, calculated by dividing the costs of crop production by value added by social prices.

It can be considered as a measure of determining economic effectiveness or comparative advantage as it is known as an international term and is calculated according to the following formula:

$$DRC = G/E - F$$

Whereas: DRC = the cost of local resources, G = the cost of non-tradable materials (local factors) at social prices, E = revenue at social prices, F = inputs tradable at social prices.

A-If ($DRC > 1$), this means that the alternative cost of the local factors involved in the production of the commodity is greater than the added value and this leads to the fact that the country is not in an international competition in the production of this commodity and therefore does not enjoy the comparative advantage in the production of the commodity and must be produced other goods.

B-If ($DRC < 1$) this means that the cost of the domestic worker is less than the social profit and this leads to the country having a

comparative advantage and the production of the commodity must be expanded.

C-As for if (DRC = 1) this means that there is no profit or loss, that is, the use of local resources has reached its optimum limits.

3-The private cost ratio coefficient (PCR): it is the cost of local resources at private prices divided by revenues minus the inputs that are tradable at special prices. It also means the net return required so that the farmer can continue to produce:

$$PCR = C / (A - B)$$

Whereas: PCR = private cost ratio factor, C = special prices for non-tradable inputs, A = revenue at special prices, B = special prices for tradeable inputs.

If the value of this parameter is less than the correct one, the costs or the money invested are less than the added value achieved, and then the farmer makes a profit, but if the value is greater than the correct one, that means the farmer's loss

6-Agricultural Producer Support Factor (PSR): It is a profit at private prices minus profit at social prices divided by revenue at social prices. This factor is inferred from the real percentage of government support to the agricultural product:

$$PSR = (D - H) / E * 100$$

Whereas: PSR = Support Factor for Agricultural Producers, D = Profit at Special Prices, H = Profit at Social Prices, E = Revenue at Social Prices.

If this percentage is greater than zero, then this means that there is support provided to the farmer, but if the ratio is less than zero, this means that there are taxes imposed on the farmer.

Policy analysis matrix building procedures

1- Field Account of the Policy Analysis Matrix Tables (2), clarifies the technical transactions for the production of red meat, as

they represent the production elements and requirements for a single field, as well as the productivity of one field according to the three categories and the total sample to which the sample was divided. The inputs included in the stores included the number of calves, which was averages 38 calfs.Field⁻¹ for the first category, 58 calfs.Field⁻¹ for the second category and 84 calfs.Field⁻¹ for the third category and the average total of the sample was 56 calfs.Field⁻¹. Likewise, the average weight of the primary calves was by 5281 kg / Field⁻¹ for the first category, 8469) kg / Field⁻¹ for the second category and (13696) kg / Field⁻¹ for the third category with an average of 8242 kg / Field⁻¹ for the total sample.

As for the amount of vaccines and treatments, its rates were 8 kg. Field⁻¹ for the first category, 12.6 kg.Field⁻¹ for the second category and 19 kg.Field⁻¹ for the third category and an average of 12 kg. Field for the total sample.

As for the non-tradable inputs, they included the number of workers and their averages according to the categories were 504 workers. Field⁻¹ for the first category, 506 workers. Field⁻¹ for the second category, 605 workers. Field⁻¹ for the third category and an average of 522 workers.Field⁻¹ for the total sample.

As for the average concentrated feed, it was 37116 kg.Field⁻¹ for the first category, 58100 kg / Field⁻¹ for the second category, and 99848 kg. Field⁻¹ for the third category, with an average of 57853 kg / Field⁻¹ for the total sample, as was the case for dry feed was a value of 12740 Kg. Field⁻¹ for the first category and 19033 kg. Field⁻¹ for the second category and 28678 kg. Field⁻¹ for the third category and for the total sample at a rate of 18470 kg.Field⁻¹,As well as green fodder with averages 4375 kg.Field⁻¹ for the first category, 6960 kg.Field⁻¹ for the second

category and 8376 kg.Field⁻¹ for the third category and with an average of 6269 kg.Field⁻¹ for the total sample.

2- Prepare the field budget (farm)

The budget is the main and main part of the (Bayzidnejad *et al.*, 2021). Table (3) shows the budget at the production level of the commodity system which included both costs and revenues on a one-ton basis for the production of red meat in the Kokjali region in Nineveh Governorate for the production year 201 was estimated in Iraqi dinars. The costs were divided

fixed costs and variable costs and by combining the types of costs we get the total costs according to the categories and the total sample, where the highest total costs in relation to the total variable costs is the costs of calves for the total sample 53564.160, lowest percentage is the costs of green fodder for total sample 813,140, which is also among the costs.

Calculation of the first row of the policy analysis matrix (special prices)

The process of calculating the elements and items of the policy analysis matrix for the first row of the matrix at special prices (special prices) that included both costs for tradable inputs, non-tradable inputs, returns, profits for the three categories and the total sample. As shown in table (4). For the first category, about 33534.62 thousand dinars per field and the equivalent of 4505.95 dinars.ton⁻¹, and this was done depending on the productivity of one field. As for the second category, the total costs for the traded inputs were about 61313.91 thousand dinars per field and the equivalent of 5533.60 dinars / ton depending on the productivity of the field. As for the third category, the total costs for the traded inputs were about 88460.71 thousand dinars per field and the equivalent of 5610.20 dinars / ton depending on the productivity of one field. While the average total costs for the inputs traded to the total sample amounted to about 56206.12 thousand dinars per field and the

equivalent of 5300.52 dinars.ton⁻¹, depending on the productivity of one field. And the equivalent of 2364.94 dinars.ton⁻¹. For the second category, it amounted to 26011 thousand dinars.field⁻¹ and the equivalent of 2347.50 dinars.ton⁻¹, 41303.29 thousand dinars.field⁻¹ for the third category and the equivalent of 2619.46 dinars.ton⁻¹. As for the total sample, the total costs of the non-traded inputs About 25667.06 thousand dinars for the field and the equivalent of 2420.53 dinars.ton⁻¹.

According to this principle, the estimate of private profits was obtained by subtracting the traded inputs from the return calculated at the market price. The second category amounted to about 66394.08 thousand dinars for the field and the equivalent of 59921.87 dinars.ton⁻¹. The third category has its own profit amounted to 94477.17 thousand dinars for the field and 59917.33 thousand dinars.ton⁻¹. As for the total sample, the profitability Its own 63541.82 thousand dinars for the field and the equivalent of 59922.93 thousand dinars.ton⁻¹.

Calculation of the second row of the policy analysis matrix (social prices):

The social or global assessment of traded inputs, non-traded inputs and outputs is an important part of building a policy analysis matrix. Global prices reflect prices that if the economy is in perfect balance and all markets are fully competitive markets. The inputs must be divided when conducting the social assessment process into the inputs of the stores in it from the import side and the inputs of the stores in it from the exporting side, and this was done based on their prices. It is also not possible to evaluate some of the non-traded inputs, such as land, capital, work, quality, and others. Each of them has a special calculation and evaluation method (Albert, & Chuma, 2011). For the lack of accurate information and data, the border prices

and estimated data were relied upon. the import equality prices were calculated according to the following equation (Priyanka *et al.*, 2015):

$$IPP = BPcif * ER + HCP + TCMP + IC + TCFM$$

IPP = Import Parity Price. BPcif = import border price. ER = equilibrium exchange rate. HCP = Loading and handling costs. TCMP = border transportation costs to market.

IC = insurance costs. TCFM = Transfer costs from farm to market.

And calculate the equality prices for export according to the following mathematical equation :

$$EPP = BPfob * ER - HCP - TCBM - TCFM$$

EPP = Import equivalent price. BPfob = export border price. ER =equilibrium exchange rate. HCP =Loading and handling costs. TCBM = Transfer costs from border to market.

= Equal IC = insurance costs. TCFM = Transfer costs from farm to market.

Through table (5), which shows how we were able to convert international prices into the equal value of import at the farm gate for red meat (The World Bank, 2018). The price of one ton of red meat for the year 2018 has been approved and recorded in the publications of FAO, the World Food and Agriculture Organization, which is 1500 dollars.ton⁻¹.

This price has been adjusted to the import price of the country after multiplying by the equilibrium exchange rate of the Iraqi dinar against the US dollar, and this was done on the basis of the exchange rate issued by the Central Bank of Iraq, which was then (1.209) dinars.dollars⁻¹. The international price of meat was 1813.5 thousand dinars / ton⁻¹, as it was calculated according to the equal value of importing a ton of red meat.

After adding the costs of transportation, loading and unloading from the port or borders to the main warehouses, an equal value of import was

obtained, which amounted to 22852.283 for the three categories and the total The sample, after subtracting the costs of transportation from the farm gate to the main stores, the social price of a ton of meat was obtained at the farm gate, which amounted to 22832.09, 22828.11, 22516.72, and 22827.98 thousand dinars / ton⁻¹ for the categories and the total sample in order, which represents the social return per ton of red meat.

After relying on the productivity of a single field, which is locally 10603.81, 15767.82,11080.29 and 7442.28) kg / field⁻¹ for the three categories and the total sample in order, where the social yield of calves fields per field for red meat production was obtained 24206.93, 35503.66, 25294.11, and 16992.98 (One thousand dinars / field⁻¹, where the inputs traded and non-traded at these prices were calculated in addition to the social profitability and the social return, as is the case in table (6), which clarifies the cost of the production elements and the returns at the social prices, as this is the farm budget at international prices.

Table (2): Technical Transactions for Red Meat Production in Kokjali District in Nineveh Governorate for the year 2018.

Inputs	Production elements	Average quantity (field)							
		1 st category	± SD	2 nd category	± SD	3 rd category	± SD	Total sample	± SD
Inputs traded by	Average number of calves(calf.field ⁻¹)	38	0.01	58	3.98	84	1.09	56	2.32
	Average weight of primary calves(kg.field ⁻¹)	5281.485	10.21	8469.458	12.54	13696.294	51.02	8242.230	13.98
	Average amount of vaccines & treatment(kg.field ⁻¹)	8.281	5.12	12.640	7.32	19.125	4.05	12.217	2.11
Non- traded Inputs	Average number of workers(worker.field ⁻¹)	504	11.20	506	11.52	605	7.21	522	12.57
	Average feed concentration(kg.field ⁻¹)	37116.742	22.01	58100.000	65	99848.823	20.64	57853.160	51.24
	Average dry feed(kg.field ⁻¹)	12740.285	104.01	19033.958	84.87	28678.823	109.21	18470.800	6.01
	Average green feed(kg.field ⁻¹)	4376.000	97.89	6960.000	3.21	8376.470	35.32	6269.400	1.20
Production rate(kg.field ⁻¹)		7442.285	48.26	11080.291	86.25	15767.823	87.20	10603.810	3.33

Source: The table was prepared by the researcher, based on the questionnaire

Table (3): Costs and revenues in the farm budget and its relative importance for the production of red meat in the Kokjali district of Nineveh Governorate for the year 2018.

Statement	first category			second category			third category			The total sample		
	Average value(thousand dinars.Field ⁻¹)	Relative importance%	± SD	Average value (thousand dinars. Field ⁻¹)	Relative importance%	± SD	Average value(thousand dinars. Field ⁻¹)	Relative importance%	± SD	Average value (thousand dinarsfield ⁻¹)		± SD
The cost of buying calves	31948.800	64.870	25.01	58940.062	67.495	57.98	82887.359	63.875	69.45	53564.160	65.423	65.58
The cost of concentrated feed	12516.571	25.414	18.57	20065.06	22.977	87.97	33456.176	25.782	54.87	19699.580	24.061	198.69
The cost of dry feed	1584.971	3.218	21.35	2337.083	2.676	24.35	3524.411	2.716	11.98	2275.690	2.779	76.92
The cost of green fodder	682.000	1.384	11.02	842.791	0.965	12.03	999.411	0.770	32.14	813.140	0.993	97.21
costs of treatments & vaccinations	1585.828	3.219	98.32	2373.854	2.718	57.78	5573.352	4.294	33.54	2641.960	3.226	58.34
Total variable costs	46433.171	94.280	56.54	84558.854	96.832	12.36	12644.712	97.438	2.03	78994.53	96.484	2011.1
Fixed costs												
Family work costs	2817.085	5.719	58.98	2766.062	3.167	29.64	3323.294	2.561	102.21	2878.650	2878.650	155.12
Total fixed costs	2817.085	5.7191	20.35	2766.0625	3.167	87.10	3323.2941	2.561	52.65	2878.6500	2878.6500	142.01
Total costs	49250.257	100	97.12	87324.916	100	89.32	12976.007	100	105.36	81873.18	81873.18	176.32
Total revenue	44653.29	-	102.25	66481.00	-	21.32	94606.18	-	49.69	63623.00	63623.00	188.77
Total net profit	4596.967	-	58.98	20843.916	-	87.65	81630.173	-	18.39	63541.82	18250.18	186.38

Note:"The cost of the land rent, workers' wages, policy price, and depreciation are implicit in both types of costs".

Source: Prepared by the researcher using the questionnaire and table (2).

Table (4): Costs of production, revenue and special profitability (farm budget) costs at special prices (special prices) (1,000 Iraqi dinars) by category for red meat producers in the Kokjali region of Nineveh Governorate for the year 2018.

Statement	Production elements	First category				Second category				Third category				Total sample			
		Cost of productive component(dinar.field ⁻¹)	± SD	Cost of productive element(dinar/ton ⁻¹)	± SD	Cost of productive component(dinar.field ⁻¹)	± SD	Cost of productive element(dinar.ton ⁻¹)	± SD	Cost of productive component(dinar.field ⁻¹)	± SD	Cost of productive element(dinar.ton ⁻¹)	± SD	Cost of productive component(dinar.field ⁻¹)	± SD	Cost of productive element(dinar.ton ⁻¹)	± SD
Inputs traded by	cost of buying calves	3198.80	35.02	4292.87	11.02	58940.06	102.54	5319.36	0.21	82887.35	109.22	5256.74	15.35	53564.16	129.35	5051.37	79.23
	costs of treatments & vaccinations	1585.82	11.21	213.08	5.02	2373.85	64.58	214.24	1.03	5573.35	25.31	353.46	0.69	2641.96	25.21	249.15	65.57
Total inputs to stores		4784.62	7.05	4505.95	21.02	61313.91	25.51	55.12	7.21	88460.71	12.30	5610.20	91.11	56206.12	68.21	68.21	34.11
Entries are not traded	The cost of concentrated feed	12516.57	23.54	1681.81	33.32	20065.06	41.25	1810.87	24.32	33456.17	87.02	2121.80	13.54	19699.58	129.32	1857.77	41.01
	The cost of dry feed	1584.97	5.04	212.96	0.22	2337.08	86.32	210.92	4.01	3524.41	6.06	223.51	0.87	2275.69	168.32	214.60	17.12
	The cost of green fodder	682.00	6.35	91.63	3.12	842.79	4.65	76.062	0.98	999.411	12.01	63.782	0.05	813.140	32.65	76.683	12.35
	Family work costs	2817.08	4.05	378.52	52.21	2766.06	11.39	249.63	2.32	3323.29	85.21	210.76	1.08	2878.65	120.32	271.47	15.01
Total non-traded entries		17600.62	11.25	2364.94	31.0	26011	55.24	2347.50	11.87	41303.29	60.35	2619.46	81.28	25667.06	187.21	187.21	99.32
Total costs of input traded & non-traded		51135.25	91.32	6870.90	0.54	87324.91	85.32	7881.10	41.31	12976.00	54.21	8229.67	11.02	81873.18	197.32	197.32	75.23
Return		44653.29	78.12	60000.01	43.20	66481.00	55.31	59999.98	87.32	94606.18	23.10	60000.01	101.02	63623.00	152.22	152.22	141.32
Private profitability		44602.02	70.25	5993.12	22.32	66394.08	54.21	59921.87	87.04	94477.17	22.15	59917.33	79.25	63541.82	148.11	59922.93	214.20

Source: Prepared by the researcher using the questionnaire and table (2).

Table (5): International prices for red meat and converting it into an equal social value.

Statement	First category	Second category	Third category	Total sample
Export price per ton of fresh global calves in dollars (dollars.ton ⁻¹)	18841.32	18841.32	18841.32	18841.32
The cost of transportation and insurance up to the borders of the country (port) in dollars (dollars.ton ⁻¹)	35	35	35	35
The import price of the country in dollars (dollars.ton ⁻¹)	18876.32	18876.32	18876.32	18876.32
Balance exchange rate (dinar.dollar ⁻¹)	1.209	1.209	1.209	1.209
The import price for the country in Iraqi dinars (thousand.tons ⁻¹)	22821.47	22821.47	22821.47	22821.47
The cost of transport, loading and unloading from the port to the main warehouses in Iraqi dinars (thousand dinars.ton ⁻¹)	30.813	30.813	30.813	30.813
Equal value of import (thousand dinars.ton ⁻¹)	22852.283	22852.283	22852.283	22852.283
Transport costs from the farm gate to the main stores (thousand dinars.ton ⁻¹)	20.193	24.166	35.554	24.298
The social price per ton of meat at the door of the farm (thousand dinars.ton ⁻¹)	22832.09	22828.11	22516.72	22827.98

Source: prepared by the researcher, based on the following:

1-The World Bank annual prices for international commodities, 2018.

2-Study sample data.

Table (6): Costs of production, revenue, and social profitability (farm budget) costs at global prices (social prices) (1,000 Iraqi dinars) by category for red meat producers in the Kokjali region of Nineveh Governorate for the year 2018.

Statement	Production elements	First category				Second category				Third category				Total sample			
		Cost of productive component(dinar.field ⁻¹)	± SD	Cost of productive element(dinar.ton ⁻¹)	± SD	Cost of productive component(dinar.field ⁻¹)	± SD	Cost of productive element(dinar.ton ⁻¹)	± SD	Cost of productive component(dinar.field ⁻¹)	± SD	Cost of productive element(dinar.ton ⁻¹)	± SD	Cost of productive component(dinar.field ⁻¹)	± SD	Cost of productive element(dinar.ton ⁻¹)	± SD
Inputs traded by	cost of buying calves	22617.3	25.21	3039.02	47.01	49211.56	51.48	4441.35	79.24	72619.85	56.21	4567.52	18.21	43822.66	157.21	4132.70	135.21
	costs of treatments & vaccination	1492.51	21.36	200.54	11.02	294.57	0.32	207.08	1.58	5464.75	11.32	346.57	2.03	2544.55	22.32	239.46	25.12
Total inputs to stores		24109.81	25.56	3239.57	29.32	51506.13	58.30	4648.44	29.32	77484.61	88.34	4914.09	18.90	46367.21	140.01	140.01	112.02
Entries are not traded	The cost of concentrated feed	12516.57	23.97	1681.81	11.78	20065.06	51.22	1810.87	18.27	33456.17	21.03	2121.80	25.02	19699.58	111.20	1857.77	97.20
	The cost of dry feed	1584.97	14.02	212.96	0.54	2337.08	7.05	210.92	1.03	3524.41	0.02	233.51	4.02	2275.69	32.01	214.60	15.10
	The cost of green fodder	682.00	0.03	91.63	0.08	842.79	11.02	76.06	0.07	999.41	1.24	63.38	0.09	813.14	21.33	76.68	11.2
	Family work costs	2817.08	14.24	378.52	12.03	2766.05	11.57	249.63	0.13	3323.28	18.98	210.76	0.08	2878.64	63.28	271.47	24.10
Total non-traded entries		17600.61	59.32	2364.94	18.98	26010.99	21.32	2347.50	60.12	41303.28	66.87	2619.46	2.08	25667.05	88.35	2420.53	81.25
Total costs of input traded & non-traded		41710.43	97.12	5604.52	98.35	77517.12	87.44	2300.94	22.13	11878.89	17.21	7533.56	47.10	72034.26	116.87	6793.20	34.57
Return		16992.98	102.32	22832.08	24.54	25294.11	3.08	22828.10	15.34	35503.66	22.85	22516.71	28.32	24206.93	196.69	22827.97	128.02
Social Profitability		24717.45	1.0025	17227.56	15.57	52223.01	10.24	20527.16	15.01	23624.77	79.32	14983.15	87.22	47827.33	100.87	16034.77	134.21

Source: Prepared by the researcher using the questionnaire and table (2).

Results

After costs and returns have been calculated at the special (local) and social (global) prices, it has become possible to make estimates for the elements of the Policy Analysis Matrix (PAM) by filling the rows and columns using tables (4) and (6) for the

three categories and the total sample. Where the policy analysis matrix was built for the production of one field as well as for the production of one ton for the three categories respectively and the total sample is calculated in thousands of dinars.ton⁻¹ for the production of red meat.

Table (7): Results of the policy analysis matrix for one ton of red meat for the first category of the sample of red meat producers studied in the Kokjali region of Nineveh Governorate for the year 2018 (1000 dinars/ton⁻¹).

Profits	Costs		Revenues	Statement
	Non-tradable input	Tradable inputs		
44602.03	17600.62	33534.62	44653.29	Special prices (private)
12821.49	17600.61	24109.81	16992.93	Social (economic) price
44474.53	0.009	29424.81	44483.35	Transfers (policy effect)

Source: Preparing the researcher based on the data of tables (4) & (6).

Table (8): Results of the Policy Analysis Matrix for One Ton of Red Meat for the Second Category of Sample of Red Meat Producers in Kokjali District in Nineveh Governorate for the year 2018 (1000 dinars.ton⁻¹).

Profits	Costs		Revenues	Statement
	Non-tradable input	Tradable inputs		
66394.08	26011	61313.91	66481.00	Special prices (private)
17542.99	26010.99	51506.13	25294.11	Social (economic) price
66219.09	0.009	9807.78	6228.88	Transfers (policy effect)

Source: Preparing the researcher based on the data of tables (4) & (6).

Table (9): Results of the policy analysis matrix for one ton of red meat for the third category of red meat producers sample in Kocaeli region, Nineveh Governorate for the year 2018 (1000 dinars.ton⁻¹).

Profits	Costs		Revenues	Statement
	Non-tradable input	Tradable inputs		
94477.17	41303.29	88460.71	94600.18	Special prices (private)
23625.76	41303.28	77484.61	35503.66	Social (economic) price
94240.40	0.009	10976.1	94251.51	Transfers (policy effect)

Source: Preparing the researcher based on the data of tables (4) & (6).

Table (10): Results of the Policy Analysis Matrix per Ton of Red Meat for the Total Sample of Red Meat Producers in Kokjali Region in Nineveh Governorate for the year 2018 (1000 dinars. ton⁻¹).

Profits	Costs		Revenues	Statement
	Non-tradable input	Tradable inputs		
63541.82	25667.06	56206.12	63623.00	Special prices (private)
17003.672	25667.05	46367.21	24206.932	Social (economic) price
63371.147	0.010	9838.91	63381.067I	Transfers (policy effect)

Source: Preparing the researcher based on the data of tables (4) & (6).

Finally, upon observing table (10), which clarifies the results of the policy analysis matrix per ton of red meat, which represented the total study for red meat producers in the Kokjali region in Nineveh Governorate for the year 2018. 56206.12 thousand dinars.ton⁻¹. Its total cost in social prices (F) was about 46367.21 thousand dinars / ton⁻¹. As for the cost of non-traded inputs for local resources at special prices (C), they amounted to about 25667.06 thousand dinars.ton⁻¹. The non-traded inputs (G) reached 25667.05 thousand dinars.ton⁻¹. As for the return on social prices (E), it reached 24, 206,932 thousand dinars.

ton⁻¹. The private return (A) was 63623.00 thousand dinars.ton⁻¹.

Also from table (10) the results indicated that the production of red meat in the study area in light of the special prices achieves special profits amounting to 63541.82 thousand dinars.ton⁻¹.

After the process of estimating the results of the policy analysis matrix for all groups and the total sample for the study on red meat production, which was previously explained in the previous tables that pertain to the policy analysis matrix, whose results indicated that the return transfers (I) were

positive for all categories of the matrix and the total that represents the study sample Per ton. Where it represented the difference between the return on special prices (A) and the return on social prices (E). This indicates that the private return is greater than the social return for all matrices for the categories and the total sample, which means that there is support by the state for meat production for the year 2018.

Also, the results of the price policy matrix analysis indicated that red meat production made special profits (D), as they were all positive for the categories and the total sample. While the product itself achieved positive (H) profits, but it was less than private profits, which led to losses in the private markets. This indicates the need to use local resources efficiently and calls for a reduction in the cost of production per field. This indicates that the price policy that is used Encourages the use of non-traded inputs, but not in an optimal way for use.

As for the non-traded inputs (K), they were positive for all the results that appeared in the matrix and for the categories and the total sample. This indicates that there is no real state support for the non-traded inputs.

While transfers of inputs traded by (J) indicated that the results of the policy analysis matrix for the categories and the total sample sequentially per ton are positive in the first, second and third, which indicates that the special prices for tradeable inputs are greater than the social prices for them, which indicates that there is no real subsidy From the state.

Finally, net transfers L whose results indicated the matrix of policy analysis of the categories and the total sample are positive, as they reached the total sample 63371.147

thousand dinars.ton⁻¹, which means that government intervention policies in the commodity system of red meat reflect its shadows on the prices of inputs traded and non-traded and on the prices of output They all serve the interests of local producers in the short term.

Results of measures of protection and comparative and competitive advantage

After the elements of the Policy Analysis Matrix (PAM) were estimated and calculated, it became possible to measure the effect of government intervention policy on prices by estimating some economic indicators that include protection coefficients or comparative advantage coefficients (Ahmed, 2020). Table (11) shows the most important of these transactions:

Nominal coefficient of protection for outputs

Table (11) data indicates that the nominal protection coefficient of the outputs for the three categories and the total sample 0.263, 0.266, 0.263, and 0.262 were all less than the correct one and this means that the state did not interfere to protect red meat production in the domestic market for the year 2018.

Nominal coefficient of production inputs (inputs) traded

The values of the nominal protection coefficient of production requirements for categories and total 1.212, 1.141, 1.190, and 1.390 are all positive and greater than one, which indicates that the prices of traded inputs are greater than the prices of their global counterparts, and this confirms that there is no real support provided for these inputs from before the state.

Table (11): Protection coefficients and the comparative and competitive advantage of red meat production in Nineveh Governorate for the year 2018.

Transactions	Absolute value of the first class	Absolute value of the second category	Absolute value of the third class	Absolute value of the fourth class
Nominal protection coefficient of output	0.262	0.263	0.266	0.263
Input nominal protection coefficient	1.390	1.190	1.141	1.212
Effective protection coefficient	0.306	0.326	0.033	0.324
Coefficient of social profitability	0.347	0.378	0.399	0.373
Product subsidy rate	26.17%	26.18%	26.54%	26.18%
Special cost ratio	0.0039	0.0039	0.0044	0.0040
Domestic resource cost factor	0.120	0.129	0.148	0.131

Source: The numbers were calculated by the researcher based on tables (7), (8), (9) and (10)

Effective protection factor

This parameter indicates distortions in the production markets and their requirements alike (Mohammed *et al.*, 2020), and it is a more efficient standard for showing the impact of local economic policy on the production markets and its requirements, and from the table above it appears that the value of the effective protection factor for the three categories and the total respectively It amounted to 0.324, 0.033, 0.326, and 0.306, which indicates that the added value of red meat production at special prices is less than the value added in social prices and for the three categories and the total sample. The effect between the cost of tradable inputs and revenues makes private price profits outweigh those of social prices and this means that

returns to producers are less than if prices were border or global prices. This indicates

that there is no government interference in the commodity system.

Social profitability factor

The values of the profitability coefficient for the categories and total sample respectively, amounted to 0.373, 0.399, 0.378 and 0.347 which are positive and less than the correct one. This indicates that the red meat system in the study area does not benefit from the government support policy used to achieve greater social profits at the expense of private profits. And all of them were higher than private profits. For categories and total sample respectively. This means that the

commodity system is losing its profits in a favour of other sectors of the economy.

Product subsidy rate

The value of the product subsidy coefficient, which had appeared positive for the categories and the total sample in order 26.18%, 26.54%, 26.18%, and 26.17%, indicates that there is support and may be limited to a specific and minimal aspect provided to red meat producers in the study area.

Special cost ratio

The values of the special cost ratio came less than the correct one and they are all positive for the categories and the total sample reached 0.0040, 0.0044, 0.0039, and 0.0039, which indicates that the red meat product system has the ability to compete, and that the social price system has a competitor and achieve positive profits compared to the world. However, the net added value of the special prices invested in meat production in Kokgali is higher than the cost of producing it for one field or per ton, which leads to obtaining profitable prices in the end in the study area only and achieving positive profits.

Domestic resource cost factor (comparative advantage)

This parameter reflects the concept of production efficiency in relation to the global market. It shows the extent of the state's ability to substitute its domestic resources for the production of one unit of the commodity to provide a unit of foreign exchange that can be directed to import that commodity, meaning that this parameter is used as a measure of the comparative advantage of production activity (Bahagat *et al.*, 2017). Table (11) data indicate that the values of the local resource cost factor are in sequence for the three categories and the total it reached

0.131, 0.148, 0.129, and 0.120. This confirms that the Kokkeli region has a comparative and competitive advantage for the production of red meat. That is, the factor is less than the right one. This indicates that the alternative cost of using local resources at international prices is lower than the value added of meat production at international prices this means lower

Conclusions

It is possible to reach a final conclusion, and depending on the matrix and indicators, we found that the net value added of the private prices invested in the production of meat in Gökçeli is higher than the cost of its production per field or per ton, which leads to obtaining remunerative prices in the end in the study area and achieves positive profits. It has a comparative and competitive advantage in fattening local calves compared with imported fattened calves and imported chilled meat.

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Conflicts of interest

The authors declare that they have no conflict of interests.

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دراسة اقتصادية للميزة النسبية والقدرة التنافسية للحقول الصغيرة لتسمين عجول الابقار في محافظة نينوى لعام 2018

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المستخلص: تهدف الدراسة الى قياس الميزة النسبية والتنافسية لإنتاج اللحوم الحمراء في منطقة كوكجلي بمحافظة نينوى للعام 2018 من خلال بعض المقاييس المستنبطة من مصفوفة تحليل السياسة. اعتمدت الدراسة على البيانات الاولية التي تم جمعها من خلال استمارة الاستبيان لعينة عشوائية بلغت 100 حقل ضمت 5610 عجلا مستوردا في منطقة كوكجلي بمحافظة نينوى للعام الانتاجي 2018. تم توزيع العينة الى ثلاث فئات حسب عدد العجول. قسمت العينة الى ثلاث فئات وذلك حسب اعداد العجول، تحتوي الفئة الأولى من الحقول على 25-49 عجل وبلغ عددها 35 حقل، والفئة الثانية تمثل الحقول التي تحتوي على 50-74 عجل وبلغت (48) حقلا، أما الفئة الثالثة فتمثل الحقول التي تحتوي 75 عجل فما فوق وبلغت 17 حقلا. اشارت نتائج الدراسة الى ان مقاييس الحماية ومؤشرات الميزة النسبية. اظهرت عدم وجود دعم حكومي لحماية انتاج اللحوم الحمراء في السوق المحلي للعام 2018 وذلك واضح من معامل الحماية الاسمي للمخرجات (0.263). كذلك الحال مع معامل الحماية الاسمي للمدخلات 1.212 اذ اظهرت نتائج الدراسة على عدم وجود دعم حكومي. ايضا أشار مقياس نسبة التكاليف الخاصة إلى أن نظام منتج اللحوم الحمراء له قدرة على المنافسة الدولية 0.004. وأخيرا أشارت قيمة معامل كلفة المورد المحلي 0.131 إلى أن منطقة كوكجلي تتمتع بميزة نسبية وتنافسية لإنتاج اللحوم الحمراء حيث ظهر المعامل فيها اقل من الواحد الصحيح.

كلمات مفتاحية: المصفوفة السعرية، الميزة النسبية للحوم الحمراء، معايير الكفاءة.