FINANCIAL EVALUATION OF NAIMI SHEEP FATTENING SYSTEMS IN AL-AHSA GOVERNORATE, KINGDOM OF SAUDI ARABIA

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ABSTRACT

This research was aimed at conducting a financial evaluation of sheep feeding systems in Al-Ahsa in KSA to identify the feasibility of investing in these projects. By field study, identified two systems for fattening the first system of fattening for 4 months, 3 cycles a year, and the second system of fattening for 6 months, two cycles a year. Secondary data collected by the Ministry of Environment, Water and Agriculture, the annual statistical book, a random sample of sheep breeders in Al-Ahsa governorate. The criteria for financial evaluation of projects are used. The results showed that the system of fattening for 4 months better than the other system, where the internal rate of return (IRR) for the first system 84% compared to 62% for the second, respectively. While the ratio of revenues to the cost of the two systems amounted to about 1.27, while the net present value amounted to 2592, 2160.7 thousand riyals respectively. In the absence of support, the preference of the fattening system are also shown for 4 months, with an internal rate of return of about 44% compared to 34% for the fattening system for 6 months. The study recommends directing the largest amount of Saudi investment to agricultural investment, particularly in the field of animal production, and encouraging investment in red meat manufacturing, to reduce reliance on imports from unsafe external sources and to achieve an appropriate level of food security in red meat.

Keywords: red meat, livestock projects, internal rate of return, eastern region, sensitivity analysis.

مجلة العلوم الزراعية العراقية -2019 :50(6):1588-1596 امين وآخرون

التقييم المالي لنظم تسمين الأغنام النعيمي في محافظة الإحساء بالمملكة العربية السعودية

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المستخلص

استهدف البحث الحالي إجراء تقييم مالي لنظم تسمين الأغنام النعيمي في محافظة الإحساء للتعرف على مدى جدوى الاستثمار في تلك المشروعات. تبين من الدراسة الميدانية أن هناك نظامين للتسمين الأول نظام التسمين لمدة 4 شهور بواقع 3 دورات في العام، وثانيهما لمدة 6 شهور بواقع دورتين في العام، واعتمد البحث على البيانات الثانوية من وزارة البيئة والمياه والزراعة، الكتاب الإحصائي السنوي، والبيانات الأولية من خلال عينة عشوائية من مربي الأغنام في محافظة الأحساء. استخدم البحث معايير أسلوب التقييم المالي للمشروعات. وأوضحت نتائج التقييم المالي أن نظام التسمين لمدة 4 شهور أفضل من نظام التسمين لمدة 6 شهور بجميع المقاييس، حيث بلغ معدل العائد الداخلي للنظام الأول 84% مقارنة بنحو 62% للنظام الثاني على التوالي. في حين تساوت نسبة الإيرادات للتكاليف حيث بلغت نحو 1.27، أما القيمة الحالية الصافية فقد بلغت 2592، 2160.7 ألف ريال لكل من النظامين على الترتيب. وفي حالة عدم وجود الدعم تبين أيضاً أفضلية نظام التسمين لمدة 4 شهور حيث بلغت قيمة معدل العائد الداخلي نحو 44% مقارنة بنحو 34% لنظام التسمين لمدة 6 شهور. وتوصي الدراسة بتوجيه أكبر قدر من الاستثمار السعودي إلى الاستثمار الزراعي وخاصة في مجال الإنتاج الحيواني، وتشجيع الاستثمار في مجال تصنيع اللحوم الحمراء، لتقليل الاعتماد على الاستيراد من مصادر خارجية غير آمنه، ولتحقيق مستوى مناسب من الأمن الغذائي في اللحوم الحمراء.

الكلمات المفتاحية: اللحوم الحمراء، مشاريع الثروة الحيوانية، معدل العائد الداخلي، المنطقة الشرقية، تحليل الحساسية.

***Received:23/2/2019, Accepted:15/7/2019**

INTRODUCTION

The objective of the project evaluation is to decide whether to accept or reject the project based on certain criteria. That by recognizing the economic feasibility of the project or rejecting it and considering it economically inefficient. There are two types of evaluation of the new projects, namely the economic feasibility of the project, in which the project evaluated from the point of view of the national economy, and the financial feasibility or commercial profitability of the project. Alternatively, an investor, whether an individual or a corporate entity, any institution or company. The economic and financial assessment is necessary when deciding whether to accept or reject a project. The project's financial analysis is based on measuring the cash flows to and from the project and then identifying the project's ability to meet its financial needs and thus drawing up a sound plan for financing the project. The financial situation of the entities involved in its implementation and the appropriateness of the incentives for their participation. Some projects may be successful or acceptable from the point of view of financial assessment and are not successful or not acceptable from the point of view of the economic assessment or vice versa. Indicating that the financial evaluation and economic evaluation of the project to identify the nature and quality of the procedures and policies required taking and implementing the project on a sound basis. In the last three decades, Saudi Arabian government has supported the animal production throughout many agricultural policies. The sheep production is among the supported sectors in which received more attention to improve production environment, upgrading of traditional procedures and subsidize the higher feed prices. (5) Sheep and goat production systems in the United Arab Emirates (UAE) operate under scarce natural resource constraints as arid systems. The importing sheep meat markets expanded into developing countries by increasing demand with growth in income such as China, Saudi Arabia, Jordan, United Arab Emirates, India, Turkey and Qatar (Food and Agriculture Organization of the United Nations (6). The creation of seasonal markets, like Ramadan or Al Haj, the traditional food markets, the setting up of food fairs, as well as, the use of agricultural shows are possible outlets for surplus produce (9). Sheep and goat meat are a major component of the daily diet of Saudi citizens. However, sheep in Saudi Arabia is characterize as arid zone by poor productivity and small area of animal forage, exacerbated by drought and environmental degradation. Crop farming is often difficult, rarely intensive, and is constrained by many environmental factors such as rainfall, very high temperatures and low soil fertility. Sheep farming was an integral part of Bedouin culture in Saudi Arabia. Nomads and villagers graze Awassi sheep (locally called Naimi) (1). The lamb production cycle must modified with the market demand and supply, which move 11 days in the year depending upon the celebration days like the start date of Ramadan and Eid-Adha, also during winter season, to be sold for better profits. Peak Season: Before Eid-Adha, the Supply and demand for sheep increase. A large Number of buyers come to markets from urban centers of to buy animals, transport and distribute them to main areas. In winter season with higher supply. In these months' lambs become adult, and prepared for sale. Additionally, sheep breeders want to sell their surplus of lambs because it is difficulty to feed them in winter (10). There are increasing concerns of society towards the consumption of animal products. This trend influences consumer-purchasing decision making, particularly in developed countries, on another side, there are increasing of animal products demand from developing countries such as Saudi Arabia (8), also studied the analysis and discussion of the extrinsic and intrinsic factors linked with the sheep industry. The sheep fattening project is one of the income-generating projects, especially in the rural world, where the suitable environment and the low cost of the project. The project is also one of the projects that the State relies on to achieve self-sufficiency of meat, especially with the traditional methods adopted by most of the livestock breeders, which are due to poor productivity that is often not enough to meet the needs. In southern Australia, as results of a sensitivity analysis involving

changes to grain, sheep and wool prices, respectively had presented, using the various commodity price scenarios described (4). The study focused on the impacts on farm profitability and the profit rankings of the various flock options. The objective of the study is to analyze the profitability of sheep farming systems under governmental subsidies on feed and energy, and after reducing subsidies in the form of reducing the area planted for feed during the next three years.

MATERIALS AND METHODS

The study area Al-Ahsa Province, in Eastern Region, located near the Arabian Gulf east Saudi Arabia. In Table 1 and Figure 2. As shown the Eastern Region acquired the highest number of Naimi sheep in the Kingdom with more than 1.44 million heads of female represented 25.28% of total female and 329 thousands heads of Male represented 26.88% of total male according to (11). Data collected from both types of farms actively involved in sheep management. Data were subjected to analyze Internal Return Rate (IRR), The Total Cost / Total Revenue Ratio, and the benefit cost ratio (B/C Ratio) calculated. The Hypotheses of the study are evaluate the farm profitability under the governmental subsides and without receiving subsides using the Sensitivity analysis of IRR in two types of farming The Study includes two types of projects. The First is fattening animals for 4 months at purchased age on of two months where feeding during 4 months with forage. The Second is fattening animals for 6 months at purchased age where is feeding during 6 months with filling fodder. The apparent difference will be in nutrition after the age of 6 months, where feeders were used in feeding for animals older than two months. In Saudi Arabia, It is important to choose the right age for fattening in sheep. In fact, is 4 to 6 months that should be ready at 7 months to 1 years after fattening? Because the lamb before the age of 4 months or 6 months depending on the breeds is in the growth stage, so the majority of the feed they provide is used for growth only. After 6 months, the lamb is fully-grown and ready for fattening. So that, the system in the types of projects must move 15 days every cycle equally the deference in the Arabic calendar try to meet the sheep meat demand during the season of Al Haj. Figure (1).

Fattening systems	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Fattening 4 months	400				400				400			
Fattening 6 months			400						400			

Fig. 1. Cycles design in months in two types of sheep fattening

Measurement of profitability of sheep fattening indicators

In order to determine the profitability of fattening in the production of sheep red meat, a set of indicators and criteria used for such analysis used, and these indicators estimated for each cycle. The discount rate to be 5% assumed. In order to conduct data analysis of the cycles in Al-Ahsa Governorate based on the values of the calculation averages for the revenues and costs of these cycles. The project life expectancy estimated at about 20 years for the research sample farms. The indicators of feasibility study measured: (2, 3, 7).

1- Net Present Value (NPV): obtained by subtracting the present value of the total costs from the present value of the total revenue at the discount rate used.

Net present value of income = Current value of total revenue - Present value of total costs

2- Benefit / Cost Ratio: Is the ratio of the total present value of the project's (project inflows) to the total present value of costs (outflows) of the project at the discount rate used.

Benefit / Cost Ratio = **Total present value of benefits / Total present value of costs *100**

3- Internal Rate of Return: Is the rate of return of the project as a percentage, or the discount rate at which the present value of the net benefit is zero, or the capital return invested in the project throughout its life, called the project profitability.

Internal Rate of Return = smaller discount rate + (The difference between the price of the discount * The present value of the cash flow

at the lower discount rate / The absolute sum of the two values present for cash flow at the discount rate.

4- Capital recovery period (years): Is the period for net cash flows to correspond to the investment costs of the project, or the number of years during which the project can generate sufficient net cash flows to cover net investment costs in the case of equal annual cash flows.

Capital recovery period (years) = Investment costs / Net annual cash flows *100

Table 1. Distribution of Awassi (Naimi) Sheep by Sex and Age Class in Kingdom of Saudi Arabia in 2017

Regions	Less than One year		One year and over		Total		Dairy
	Male	Female	Male	Female	Male	Female	Sheep
Al Riyad	184223	226296	42771	928781	226994	1155077	340012
Makkah	1144	2232	2866	7563	4010	9795	3094
Al Madinah	5809	6378	1940	19929	7749	26307	13884
Al Qaseem	157101	236229	45170	830382	202271	1066611	565861
Eastern Region	242718	344614	86 531	1096907	329 249	1441521	502 912
Aseer	3 535	4 837	3 870	7 131	7 405	11 968	3 193
Tabuk	11 979	19 002	16 982	68 859	28 961	87 861	34 928
Hail	96 355	136 154	31 033	489 637	127388	625 791	152 594
Northen Borders	88 213	43 827	87 209	561 335	175422	605 162	6 285
Jazan	297	399	197	864	494	1 263	324
Najran	3 589	5 098	2 798	12 847	6387	17 945	4 646
AlBaha	26	35	25	214	51	249	106
AlJawf	88 502	116 653	20 103	405 124	108 605	521 777	348 874
Total	883491	1141754	341495	4429573	1224986	5571327	1976713

Source: Statistical yearbook. 2017

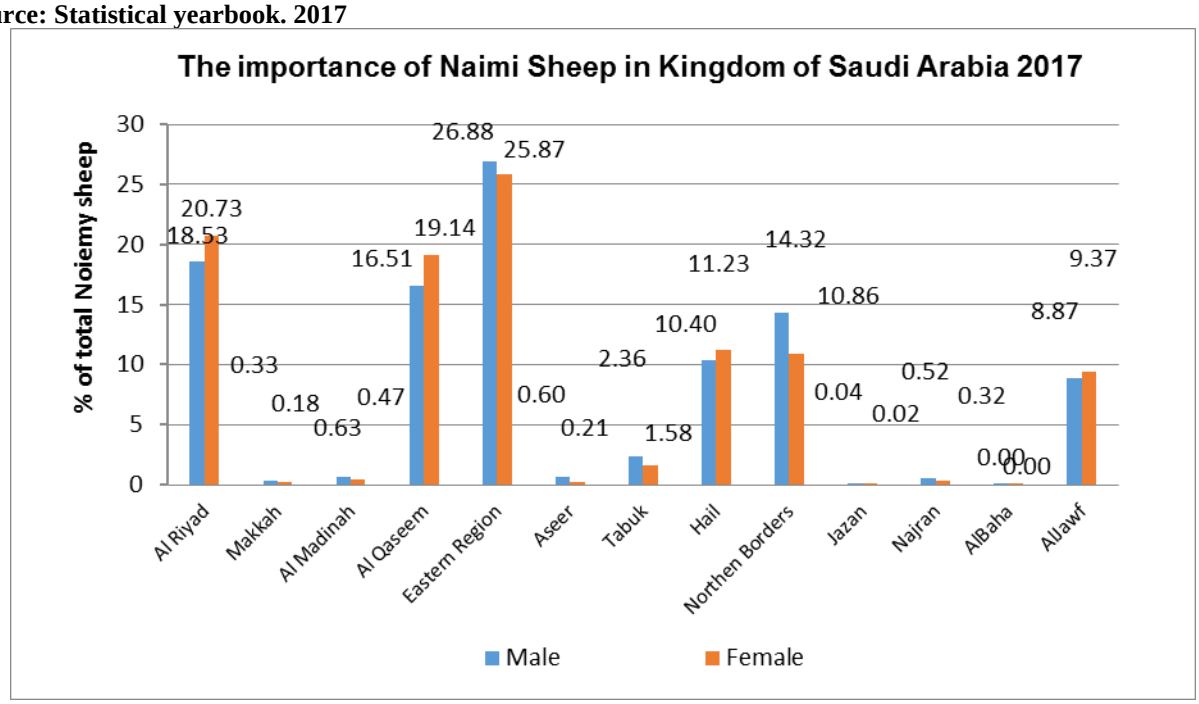

Fig. 2. The importance of Naimi Sheep in Kingdom of Saudi Arabia 2017

RESULTS AND DISCUSSION

In general, the feasibility study shows that the investment costs included fixed and working capital was initially high, represents together about 75.28%, 74.14% in both cases of receiving and non-receiving governmental subsides respectively. Wherever, the operational costs of the project where the cost of feeding has a larger share become less as noted in Table 2. In the First type of projects,

which 400 heads of lambs fattening for 4 months, operational costs represent 24.72%, 25.86% of total costs in both cases respectively. The cost of live capital (Fattening animals) represents 49.7%, 45.5% of operational costs in both cases respectively.

Table 2. Agricultural costs value of production Al-Naimi Sheep Meat according to 4 Months of Fattening (400 sheep) in Al-Ahsa governorate. (Value: SR)

Cycle Costs items	Case of governmental subsidies			without governmental subsidies		
	(Value: SR)	% of variable costs	% of Total costs	(Value: SR)	% of variable costs	% of Total costs
Fixed capital	**500000**	**-**	**51.24**	**500000**	**-**	**49.03**
current capital	**234600**	**-**	**24.04**	**255960**	**-**	**25.10**
Investment costs	**734600**	**-**	**75.28**	**755960**	**-**	**74.14**
Fattening animals	**120000**	**49.7**	**12.30**	**120000**	**45.5**	**11.77**
Green feed	**68400**	**28.4**	**7.01**	**82080**	**31.1**	**8.05**
Barley	**28400**	**11.8**	**2.91**	**36080**	**13.7**	**3.54**
Employments	**15600**	**6.5**	**1.60**	**15600**	**5.9**	**1.53**
veterinary care	**2200**	**0.9**	**0.23**	**2200**	**0.8**	**0.22**
transport and marketing	**1500**	**0.6**	**0.15**	**1500**	**0.6**	**0.15**
Electricity and water	**1000**	**0.4**	**0.10**	**1600**	**0.6**	**0.16**
Depreciations	**1666**	**0.7**	**0.17**	**1666**	**0.6**	**0.16**
Maintenance	**2500**	**1.0**	**0.26**	**3000**	**1.1**	**0.29**
Operational costs	**241266**	**100.0**	**24.72**	**263726**	**100.0**	**25.86**
Total costs	**975866**		**100.00**	**1019686**		**100.00**

*** The average number of heads in the cycle 400 head**

Feeding with green fodder and barley represents 28.4%, 11.8% of operational costs in the case of receiving subsides respectively. While, in case of non-receiving subsidies, Feeding with green fodder and barley represents 31.1%, 13.7% of operational costs respectively. The agricultural work costed about 6.5%, 5.9% of operational costs in both cases respectively, which includes the worker's salary, and all residents' arrangements treatments. The farm income of production calculated upon the animals sold in the age plus 4 months of fattening, with mortality rate of 1%, represents 98.75% of total revenue, and 1.25% other sales of skin and brush as shown in Table 3.

Table 3. Farm Income of Production of Al-Naimi Sheep Meat according to 4 Months of Fattening (400 sheep) in Al - Ahasa Governorate. (Value: SR)

Revenues	Cycle (Value: SR)	%
Animals sold	**316800**	**98.75**
Other sales	**4000**	**1.25**
Total revenue	**320800**	**100**

Mortality rate 1%

Source: collected and calculated from data of survey.

As in Table 4. Showed that, in the Second type of projects, which 400 heads of lambs fattening for 6 months, the investment costs included fixed and working capital was initially high, represents together about 72.48%, 71.27% in both cases of receiving and non-receiving governmental subsides respectively. Wherever, the operational costs represent 27.52%, 28.73% of total costs respectively. The cost of live capital (Fattening animals) represents 39.9%, 36.2% of operational costs in both cases respectively. Feeding with green fodder and barley represents 34.1%, 14.4% of operational costs in case of receiving subsides respectively. While, in case of non-receiving subsidies, because non-receiving subsidies will start feeding with Millet substituting of part of green fodder, So feeding with green mixed with milt fodder and barley represents 37.2%, 15.7% of operational costs respectively. The agricultural work costed about 7.8%, 7.1% of operational costs in both cases respectively,

Table 4. Agricultural costs value of production Al-Naimi Sheep Meat according to 6 Months of Fattening (400 sheep) in Al-Ahsa governorate. (Value: SR)

Items	case of governmental subsidies			without governmental subsidies		
	(Value: SR)	% of variable costs	% of Total costs	(Value: SR)	% of variable costs	% of Total costs
Fixed capital	500000	-	45.73	500000	-	43.37
current capital	292500	-	26.75	321660	-	27.90
Investment costs	792500	-	72.48	821660	-	71.27
Fattening animals	120000	39.9	10.97	120000	36.2	10.41
Green feed	102600	34.1	9.38	123120	37.2	10.68
Barley	43200	14.4	3.95	51840	15.7	4.50
Employments	23400	7.8	2.14	23400	7.1	2.03
veterinary care	3300	1.1	0.30	3300	1.0	0.29
transport and marketing	1200	0.4	0.11	1500	0.5	0.13
Electricity and water	1750	0.6	0.16	2500	0.8	0.22
Depreciations	2500	0.8	0.23	2500	0.8	0.22
Maintenance	3000	1.0	0.27	3000	0.9	0.26
Operational costs	300950	100.0	27.52	331160	100.0	28.73
Total costs	1093450	-	100.00	1152820		100.00

*** The average number of heads in the cycle 400 head**
Source: collected and calculated from data of survey

The farm income of production calculated upon the animals sold in the age plus 6 months of fattening, with mortality rate of 1%, represents 98.5% of total revenue and 1.5% other sales of skin and brush as shown in Table 5.

Table 5. Farm Income Value of Production of Al-Naimi Sheep Meat according to 6 Months of Fattening (400 sheep) in Al - Ahsa Governorate. (Value: SR)

Revenues	Cycle (Value: SR)	%
Animals sold	396000	98.5
Other sales	6000	1.5
Total revenue	402000	100

Mortality rate 1%
Source: collected and calculated from data of survey

Financial indicators

By calculated the financial indicators for the First type of projects of fattening for 4 months, the NPV in case of receiving subsidies is more than the NPV in the case without subsidies represent 2592 and 1748.9 thousand riyals respectively. The B/C ratio in the two cases calculated as 1.27 and 1.17 respectively. The IRR in the case with subsides is more than in the case of non-receiving subsidies which represent 84%, 44% respectively. The Capital recovery period equal 2.1and 3 years respectively, which the project can generate sufficient net cash flows to cover, net investment costs as shown in Table 6. The average return on investment costs is about 30.7%, 20.6% respectively.

Table 6. Results of the financial analysis of the sheep farms of Al-Naimi for 4 months of fattening in Al-Ahsa governorate

Indicators of financial analysis	Case with governmental subsidies	Case without governmental subsidies
1. Net present value (in thousand riyals)	2592.0	1748.9
2 - Benefits / Costs ratio	1.27	1.17
3. Internal rate of return IRR (%)	84	44
4. Capital recovery period (year)	2.1	3.0
5. Average return on investment (%)	30.7	20.6

Source: collected and calculated from results of analysis of Tables (2), (3).

In Table 7. Calculated the financial indicators for the Second type of projects of fattening for 6 months, the NPV in case of receiving subsidies is more than the NPV in the case without subsidies represent 2160.7 and 1419.7 thousand riyals respectively. The B/C ratio in the two cases calculated as 1.27 and 1.16 respectively. The IRR in the case with subsides is more than in the case of non-receiving subsidies which represent 62%, 34% respectively. The Capital recovery period equal 2.4 and 3.5 years respectively, which the project can generate sufficient net cash flows to cover, net investment costs as shown in Table 7. The average return on investment costs is about 24.2%, 16.2% respectively.

Table 7. Results of the financial analysis of the sheep farms of Al-Naimi for 6 months of fattening in Al-Ahsa governorate

Indicators of financial analysis	Case with governmental subsidies	Case of without governmental subsidies
1. Net present value (in thousand riyals)	2160.7	1419.7
2 - Benefits / Costs ratio	1.27	1.16
3. Internal rate of return IRR (%)	62	34
4. Capital recovery period (year)	2.4	3.5
5. Average return on investment (%)	24.2	16.2

Source: collected and calculated from results of analysis of Tables (4), (5).

Sensitivity analysis

1. Sensitivity analysis of the First type (fattening period 4 months)

The results thereof shown in Table 8:

1. A. In case of costs increases with 10% and fixed revenues

In case of receiving subsides, observed that IRR decrease from 37% to 14% in case of non-receive subsides, that mean IRR more sensitive to increase costs without subsides than with subsides. As the B/C ratio declined from 1.16 to 1.06 respectively, which explains the effect of subsidies on the project's profit ratio. Which is reflected by the value of NPV, which fell from 1643.1 to 714.4 thousand riyals.

1. B. In case of revenues decrease with 10% and fixed costs

In case of receiving subsides, observed that IRR decrease from 34% to 11% in case of non-receive subsides, that mean IRR more sensitive to decrease revenues without subsides than with subsides. As the B/C ratio declined from 1.15 to 1.05 respectively, which explains the effect of subsidies on the project's profit ratio. Which is reflected by the value of NPV, which fell from 1383.9 to 539.5 thousand riyals.

1.C. In case of increase the Discount rate to 10%

In case of receiving subsides, IRR for that category is more sensitive to increase the discount rate than in the case of non-receiving subsides. Where the IRR fell from about 76% to about 37%, respectively, while the B/C ratio declined from 1.24 to 1.14 respectively, with little reduction of PNV from 1617.7 to 1034.3 thousand riyals.

Table 8. Sensitivity analysis according to the calculation for the 4-month period of fattening sheep in the case of governmental subsidies, and without governmental subsidies.

Items	Case with governmental subsidies			Case of without governmental subsidies		
	IRR	B/C ratio	NPV	IRR	B/C ratio	NPV
Cost increase rate 10%	37.0	1.16	1643.1	14.0	1.06	714.4
Revenues decrease rate 10%	34.0	1.15	1383.9	11.0	1.05	539.5
Discount rate increase to 10%	76.0	1.24	1617.7	37.0	1.14	1034.3
Revenues decrease rate 10%, Cost increase rate 10% in the same time	9.0	1.04	434.9	-10.0	0.96	-494.9

Source: collected and calculated from results of analysis of Tables (2), (3).

1.D. In case of decreasing revenues with 10% and in the same time, increase the costs with 10% (critical point). In case of receiving subsides, observed that IRR decrease from 9% to (-10%) in case of non-receive subsides, that mean IRR more sensitive to decrease revenues

and increase costs without subsides than with subsides. As the cost benefit ratio declined from 1.04 to 0.96 respectively, which explains the effect of subsidies on the project's profit ratio. Which is reflected by the value of NPV, which fell from 434.9 to (-494.9) thousand riyals. To determine the sensitivity limits for this category to determine the maximum possible adverse changes in costs and revenues before the NPV becomes negative, by reference to the benefit-cost ratio previously estimated, the maximum value of IRR was in the case of increase the discount rate to 10% and receiving subsides in form of subside animal feeds, Barley and electricity. On the other hand, we note that the IRR is lower in the case of a 10% decrease in revenues and an increase in costs by the same percentage (Critical point). Where it was estimated at 9% with subsides in the rations and electricity, taking a negative trend without government subsides (-10%), with a negative value of NPV, Suggesting that the project takes a trend to loss.

2. Sensitivity analysis of the Second type (fattening period 6 months)

The results thereof shows in Table 9:

1. A. In case of costs increases with 10% and fixed revenues

In case of receiving subsides, observed that IRR decrease from 29% to 10% in case of non-receive subsides, that mean IRR more sensitive to increase costs without subsides than with subsides. As the B/C ratio declined from 1.16 to 1.06 respectively, which explains the effect of subsidies on the project's profit ratio. Which reflected by the value of NPV, which fell from 1363.8 to 547.6 thousand riyals.

2. B. In case of revenues decrease with 10% and fixed costs

In case of receiving subsides, observed that IRR decrease from 27% to 8% in case of non-receive subsides, that mean IRR more sensitive to decrease revenues without subsides than with subsides. As the B/C ratio declined from 1.14 to 1.05 respectively, which explains the effect of subsidies on the project's profit ratio. Which reflected by the value of NPV, which fell from 1147.7 to 405.7 thousand riyals.

2.C. In case of increase the Discount rate to 10%

In case of receiving subsides, IRR for that category is more sensitive to increase the discount rate than in the case of non-receiving subsides. Where the IRR fell from about 54% to about 28%, respectively, while the B/C ratio declined from 1.24 to 1.13 respectively, with little reduction of PNV from 1317.2 to 808.1 thousand riyals.

Table 9. Sensitivity analysis according to the calculation for the 6-months period of fattening sheep in the case of governmental subsidies, and without governmental subsidies.

Items	Case with governmental subsidies			Case of without governmental subsidies		
	IRR	B/C ratio	NPV	IRR	B/C ratio	NPV
Cost increase rate 10%	29.0	1.16	1363.8	10.0	1.06	547.6
Revenues decrease rate 10%	27.0	1.14	1147.7	8.0	1.05	405.7
Discount rate increase to 10%	54.0	1.24	1317.2	28.0	1.13	808.1
Revenues decrease rate 10%, Cost increase rate 10% in the same time	7.0	1.04	350.8	-9.0	0.95	-466.5

Source: collected and calculated from results of analysis of Tables (4), (5).

2.D. In case of decreasing revenues with 10% and in the same time, increase the costs with 10% (Critical point).

In case of receiving subsides, observed that IRR decrease from 7% to (-9%) in case of non-receive subsides, that mean IRR more sensitive to decrease revenues and increase costs without subsides than with subsides. As the cost benefit ratio declined from 1.04 to 0.95 respectively, which explains the effect of subsidies on the project's profit ratio. Which is reflected by the value of NPV, which fell from 350.8 to (-466.5) thousand riyals. To determine the sensitivity limits for this category to determine the maximum possible adverse changes in costs and revenues before the NPV becomes negative, by reference to the benefit-cost ratio previously estimated, the maximum value of IRR was in the case of increase the discount rate to 10% and receiving subsides in form of subside animal feeds, Barley and electricity. On the other hand, we note that the

IRR is lower in the case of a 10% decrease in revenues and an increase in costs by the same percentage (Critical point). Where it was estimated at 7% with subsides in feeds and electricity, taking a negative trend without government subsides (-9%), with a negative value of NPV, Suggesting that the project takes a trend to loss.The results of the study showed that most of the costs were in investment costs, accounted in range between 71% to 75.8% of the total costs, Feed costs were more than 30% of total operating costs. By presenting the previous results of the financial analysis of the two types of sheep feeding projects under the umbrella of support provided by the state in the form of subsidies for feed and electricity, or in the case of removal of these images of government support. We note that the first type of plant based on fattening 400 head of sheep for 4 months achieved a higher IRR than sheep-fed sheep for 6 months, confirmed by NPV. It is also clear from the results that the project is more sensitive to the case of lower revenues than in the case of higher costs. This may show the IRR value in these cases, compared with the critical situation, which may occur with a small percentage of the revenues. This is supposed to increase the prices of feed and energy, while at the same time face the price of sheep meat decline in the market, or during the summer season less consumption of lamb because of the increase in fat. The study recommends seeking to support livestock development projects in general, the sheep sector in particular, and the camel sector. The study also recommends supporting both green and dry animal feed, either by subsidizing imports or by cultivating high-yielding and less-water-consuming varieties.

ACKNOWLEDGEMENTS

The authors want to express their sincere appreciation to the deanship of scientific research, King Faisal University.

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