Financial Evaluation of Zaraibi Goat Breed Rearing under Two Production Systems

Mohamed Reda Ismail Anous[1], Ibrahim Ali Abdelfattah Mohamed[2*]

[1]*Department of Animal Production, Faculty of Agriculture, Ain Shams University, P.O. Box 68 Hadayek Shoubra, 11241 Cairo, Egypt.*

[2]*Department of Agriculture Economics, Faculty of Agriculture, Ain Shams University, P.O. Box 68 Hadayek Shoubra, 11241 Cairo, Egypt.*

*Corresponding author: dr.ibrahim.ali2030@gmail.com

ABSTRACT

Sixty-six kids of both sexes produced from twenty does of Zaraibi goat breed were taken from an experimental herd and used to evaluate the profitability of two production systems, intensive and semi-intensive, for meat production. Benefit cost ratio (B/C ratio), Net present value (NPV) and Internal rate of return (IRR) were used in the financial analysis. A sensitivity analysis was also conducted at the discount prices of 22% and 25% in the event of an increase and a decrease in production costs of 5% with all other factors remaining constant.

The results of the financial evaluation for Zaraibi goat raised under the intensive production system showed that the benefit/cost ratio (B/C ratio) in the first year of the project at the discount rates of 22% and 25% reached about 1.080 and 1.084 for each of them, respectively. However, for those raised under the semi-intensive production system, the results showed that B/C ratio reached about 1.084 and 1.080 for each of them, respectively. The net present value of the project (NPV) at the discount rates of 22% and 25% amounted to 22,084 and 21,554 thousand Egyptian pounds for each, respectively under the intensive production system and amounted to 21,098 and 20,592 thousand Egyptian pounds for each, respectively under the semi-intensive production system. The internal rate of return for the project (IRR) was about 33% in the case of intensive production system and was about 32% in the case of semi-intensive production system. We can conclude that rearing Zaraibi goat for meat production under the intensive production system was more profitable (i.e., higher NPV and IRR) than this under the semi-intensive one. The sensitivity analysis conducted in the event of an increase or a decrease in production costs of 5% confirmed that the project is economically feasible for the two production systems.

INTRODUCTION

In the developing world, livestock will remain an integral part of many agricultural systems and their natural increase and growth will add to their capital value, thus creating wealth. Most lands of countries in the Near East region are only suitable for very extensive grazing. It is now under threat from increased livestock numbers resulting from greater demand from larger urban populations. New intensive and semi-intensive production systems are also developing rapidly in this region in response to increased consumer demand for higher quality products (i.e., meat and milk). On the other hand, within the livestock sector in this region, small ruminants (i.e., sheep and goats) contribute a great share to numbers and to total output and their management varies between areas and tribes. Goats are important animals for the provision of animal protein and as a source of income to small holders in the less developed parts of the world (Mahgoub and Lodge, 1996). Furthermore, goats have an adaptive capacity to survive and produce in harsh environmental conditions particularly in dry areas (Lebbie, 2004) and thrive with minimal food and water input. In Egypt, most of the small ruminants are kept as a subsidiary enterprise to crop farming and feed mainly on grasses, crop residues and by-products. Recently, new attempts have been made by some Egyptian sheep and goat breeders to raise their animals either under intensive or semi-intensive production systems. This also happened for the Zaraibi goat breed, characterized by both its high twinning rate and milk yield and quality (Galal et al., 2005; EL-Hanafy and El-Saadani, 2009 Mahrous et al., 2016, Barakat et al., 2017; El-Malky et al., 2019). The potential to improve returns from this goat breed, especially meat production, would suggest the adoption of an intensive or semi-intensive production system rather than an extensive system.

Because productivity (i.e., outputs in relation to inputs) is considered as a major factor of variation in animal production systems existing all over the world, therefore, this factor must be used in the evaluation of the different production systems. Furthermore, until now, the goat sector is missing references on factors linked with the economics and profitability of its breeding and marketing strategies in the developing countries.

Thus, the present study was carried out to evaluate the profitability of raising Zaraibi goat for

meat production under intensive and semi-intensive production systems in an experimental farm using some financial parameters.

Data Resources:

Data for this study was collected from the herd of Zaraibi goats belonging to the Experimental Farm of the Faculty of Agriculture, Ain-Shams University, situated about 30 km north of Cairo in the village of Shalaqan, Qalyubia Governorate. The market prices of animal products and feed materials in the period from January 2022 to February 2023 were used when conducting the economic and financial evaluation.

Experimental animals:

Twenty Zaraibi does of different ages (i.e., from two to four years old) were randomly divided into two groups of equal numbers (10 does per each group) in which one group was put with their kids under an intensive production system and the other group was put with their kids under a semi-intensive production system.

Animal production systems:

For the first group (i.e., the intensive system), animals were constantly kept in a closed pen joined with a suitable yard for exercise where they received their daily requirements. They were given a concentrate mixture (16 % crude protein and 70 % TDN) at the rate of about 0.55 or 0.275 kg/head/day, for does and weaned kids, respectively. Berseem (*Trifolium Alexandrinum*) was added at 12 noon (3–5 kg/head/day). Green maize replaced the berseem in summer and autumn. For the second group (i.e., the semi-intensive system), animals were allowed to graze grass, berseem or green maize and plants or crops residuals 4 hours a day in the morning (from 8 a.m. to 12 a.m.). Then each animal received only 50% of the amount of concentrate mixture offered to the does and kids of the first group at the end of the afternoon (at 4 p.m.). Animals' requirements were changed according to their physiological status and production level. Rations were calculated based on NRC allowances (NRC, 2002). Drinking water, mineral blocks and straw were allowed as *ad libitum* to animals all day and night.

Breeding Method:

The breeding plan adopted by the authority of the farm was to obtain 3 kidding every two years (i.e., 3 kidding seasons). The females were mated in May, February and October. A Zaraibi buck was used to mate the twenty does. Before the start of the breeding season, a flushing regime was used to improve the twinning rate in the herd. All females were given synthetic ProstaglandinF$_2\alpha$ and synthetic Gonadotrophin releasing hormone to synchronize the estrus and increase their reproductivity. Buck was also given Gonadotrophin releasing hormone before mating to improve the spermatogenesis and its libido (injected with1 ml.).

Reproductive and Productive Measurements:

Litter size per parturition and total milk yield (kg) from 30 days after parturition to the start of drying period were recorded for each doe using milk control procedure. Does were milked by hand twice a day (at 8 a.m. and 5 p.m.). For every doe, total milk yield was calculated by multiplying the amount of milk obtained on the day of control by the number of days in that month up to the date of drying this doe. Then, live body weight (kg) at birth (BW$_0$), 2 months of age (BW$_2$), weaning at 4 months of age (BW$_4$), puberty at 6 months of age (BW$_6$) and marketing at 12 months of age (BW$_{12}$) were taken for each kid.

Financial evaluation indicators:

After preparing the necessary studies for the project, the evaluation process is carried out by studying the financial feasibility from the point of view of the investor as an individual or legal entity. The financial evaluation metrics used were:

1- Benefit cost ratio (B/C ratio)

This measure is also known as the rate of return to costs (Nassar, 1995). This measure can be calculated by dividing the total current revenues by the total current costs throughout the life of the project, using an appropriate discount rate equal to the opportunity cost available for investing capital in society. For the project to be profitable, the ratio of revenues to costs at a certain discount rate must exceed the correct one. This rate or ratio can be calculated the more profitable the project is from the following equation:

Return/cost ratio=Present value of revenue/Present value of costs

return/cost ratio = PVR / PVC

Return/Cost Ratio = Return/Cost Ratio

PVR = present value of revenue

PVC = present value of costs

Naturally, the larger this value is, the more profitable the project is. Generally, the project is accepted if the ratio of the present value of revenues to the present value of costs is greater than (1) correct, or if the ratio of the present value of costs to the present value of revenues is less than (1) correct.

2- Net present value (NPV)

This method is based on the fact that the current value of an amount of money that you obtain now or at the present time is greater in its true value if we obtained the same amount after a period of time. This is due to the difference in the purchasing power of money in the two previous dates or periods. The net present value is calculated from the following equation (Attia, 2008):

Net present value = present value of revenues – present value of costs

NPV = PVR-PVC

NPV = Net Present Value

PVR = present value of revenue

PVC = present value of costs

3- Internal rate of return (IRR)

The internal rate of return is the rate that equates the present value of the series of expected net returns (cash inflows) with the present value of investment spending (cash outflows), or it is the rate that makes the net present value of the investment project equal to zero, and this rate is compared as the internal rate of the project. At the rate at which external capital was obtained or at the cost of funds rate, if the internal rate of return is greater than the cost of obtaining funds, then the project is commercially acceptable, but if it is less than the cost of obtaining funds, then the project is commercially unacceptable and must be rejected.

The basic idea of this standard is that any commercial project must achieve an internal rate of return greater than the interest rate prevailing in banks in order for there to be an incentive to invest. Otherwise, it is better for the owner of the money to deposit it in banks and obtain the interest without bearing the investment risks or making any effort. Calculate the internal rate of return with the following equation (Attia, 2008):

Standard internal rate of return = smaller discount rate + (the difference between the smaller and larger rate x the present value at the smaller rate) ÷ the sum of the present value at the two rates, ignoring the algebraic sign.

IRR = the lower discount rate + (the difference between the lower and higher rate x the present value at the lower rate) ÷ the sum of the present value at the two rates.

The smaller discount rate is the discount rate that achieves a positive value, while the larger discount rate is the one that achieves a negative value.

Sensitivity analysis test

A sensitivity analysis was conducted at the discount prices of 22% and 25% in the event of an increase in production costs of 5% with all other factors remaining constant. It was also conducted at the discount prices of 22% and 25% in the event of a decrease in production costs of 5% with all other factors remaining constant.

It is one of the means of ensuring the feasibility of the project to be undertaken. This method is based on subjecting the project to be established and exposing it to a group of different expected and unexpected influences that may occur during the life of the project and measuring the extent of the project's ability to adapt to these influences and continue to pay its obligations before others and achieve Suitable rate of profits.

Sensitivity analysis is based on developing different estimates of the results of investment opportunities available in different economic conditions (optimistic, pessimistic, more likely or occurring) according to specific probability values.

Assumptions of the financial analysis

The assumptions made in the study were:

- The mating system was based on three parturitions in two years as an accelerate kidding system.
- Breeding season extended 45 days / 8 months.
- Natural mating was implemented.
- The average of two breeding seasons (i.e., February and October 2022) was taken.
- Financial analysis evaluation based on a period of one year.
- The herd produces its own replacements.
- The replacement animals enter their first season at about 12 months of age.
- Kids were sold at 12 months of age.
- Average marketing price is L.E. 4500 and 5000 for male and female kid, respectively.
- The litter size is 2.45 kid / doe / kidding.
- The average mortality rate of kids from birth to marketing is 28.8 % and 36.9 % for goats under the intensive and semi-intensive production system, respectively.
- The weight of the doe at the start of the study was on average 15.69 ± 0.31 kg.
- Manure was evaluated at marketing price (i.e., L.E. 80 per 1m^3); annual manure production was about 2.5m^3 per head per year.
- Milk was sold according to market price (i.e., L.E. 18 per 1kg).

RESULTS AND DISCUSSION

I. The most important financial indicators and standards for Zaraibi goat farm under the intensive and semi-intensive production systems

Table (1) shows at the end of the first year of the study the stability of fixed costs for each type of production systems (i.e., intensive, and semi-intensive) for Zaraibi goats and they amount to about 169 thousand Egyptian pounds for each of the systems studied.

Table 1: The value of fixed and variable costs, total costs, revenue, and net return for the intensive and semi-intensive production systems in Egyptian pounds.

Production system	Fixed costs	Variable costs	Total costs	Revenue	Net return
Intensive	169000	149948	318948	345890	26942
Semi-intensive	169000	150848	319848	345587.6	25739.6

Source: Farm questionnaire form of the farm of the Faculty of Agriculture, Ain-Shams University.

On the other hand, variable costs in semi-intensive production system is higher than in intensive production system, as variable costs amounted to about 149,948 thousand for the intensive system and 150,848 thousand Egyptian pounds for the semi-intensive one, while revenues in intensive system increase regarding the semi-intensive system, where it reached to about 345,890 thousand and 345,588 thousand Egyptian pounds, respectively, and this was followed by an increase in the net return amounting to about 26,942 thousand and 25,740 thousand Egyptian pounds, respectively, with a difference of 1202 Egyptian pounds in favor of intensive production system (i.e., 4.7% more).

II. Results of financial analysis metrics at discount rates of 22% and 25%

(a) Under intensive production system

Tables (2) and (3), show the results of the financial metrics for Zaraibi goat raised under the intensive production system. The benefit (revenue)/cost ratio (B/C) in the first year of the study under the intensive system at the discount rates of 22% (representing the current lowest interest rate) and 25% (representing the current highest interest rate) reached about 1.080 and 1.084 for each of them, respectively. This result confirms the feasibility of the project when using the intensive production system, as the ratio of benefits (revenues) to costs is greater than one, which means that every pound invested in the project achieves a net return estimated at about 0.080 and 0.084 pounds for each of them, respectively (Table 2).

The current net cash flows or the net present value of the project (NPV) amounted to about 22,084 and 21,554 thousand Egyptian pounds for each, respectively. The internal rate of return for the project (IRR) was about 33% (Table 3). This means that the rate of return is greater than the opportunity cost prevailing in society when the study was conducted at the interest rate of 22%.

(b) Under semi-intensive production system

Tables (2) and (3), also show the results of the financial metrics for Zaraibi goat raised under the semi-intensive production system. The benefit (revenue)/cost ratio (B/C) in the first year of the study at the discount rates of 22% and 25% reached about 1.084 and 1.080 for each of them, respectively. This result confirms the feasibility of the project when using the semi-intensive production system, as the ratio of benefits (revenues) to costs is greater than one, which means that every pound invested in the project achieves a net return estimated at about 0.084 and 0.080 pounds for each of them, respectively (Table 2).

The current net cash flows or the net present value of the project (NPV) amounted to about 21,098 and 20,592 thousand Egyptian pounds for each, respectively. The internal rate of return for the project (IRR) was about 32% (Table 3). This means that the rate of return is greater than the opportunity cost prevailing in society when the study was conducted at the interest rate of 22%.

From the above we can conclude that the project is economically feasible under both production systems, but slightly better under the intensive production one.

Generally, as we used as measures of financial evaluation in the present study, many authors (Ex. Abd El-Aal, M.A.G., Abd El-Hameed, S.A. and El-Shazly, S.S.A., 2022) reported economical and financial analysis for some small animal production projects, using different discount rates and different years age of the project, in applying measures such as NPV; the net present value, BC; the benefit cost ratio and IRR; the internal rate of return. These measures gave enough satisfaction and a good image about the profitability of these projects.

III. Sensitivity analysis test

It is one of the means of ascertaining the feasibility of the project to be undertaken. This method is based on subjecting the project to be established and exposing it to a group of different expected and unexpected influences that may occur during the life of the project and measuring the extent of the project's ability to adapt to these influences and continue to pay its obligations before others and achieve suitable rate of profits.

Table 2: The present value of revenues and costs at the discount rates of 22% and 25%.

Production system	Total costs in pounds	Total revenues in pounds	Discount factor 22%	Discount factor 25%	Present value of costs at 22%	Present value of revenue at 22%	Present value of costs at 25%	Present value of revenue at 25%
	318948	345890	0.820	0.800	261432.8	283516.4	255158.4	276712
Intensive	Total in pounds				284775	308830.4	277346.1	300773.9
	B/C Ratio				1.080		1.084	
	319848	345588	0.820	0.800	262170.5	283268.5	255878.4	276470.1
Semi- intensive	Total in pounds				262170.5	283268.5	255878.4	276470.1
	B/C Ratio				1.084		1.080	

Source : Collected and calculated from Table (1); questionnaire form.

Table 3: The present value of net cash flow at the discount rates of 22% and 25%.

Production system	Total costs in pounds	Total revenues in pounds	Net cash flow	Discount factor 22%	Discount factor 25%	The present value of net cash flow at 22%	The present value of net cash flow at 25%
	318948	345890	26942	0.820	0.800	22084	21554
Intensive	Total in pounds					22084	21554
	Internal rate of return (IRR)					33%	
	319848	345587.6	25739.6	0.820	0.800	21098	20592
Semi-intensive	Total in pounds					21098	20592
	Internal rate of return (IRR)					32%	

Source: Collected and calculated from Table (1); questionnaire form.

Sensitivity analysis is based on developing different estimates of the results of investment opportunities available in different economic conditions (optimistic, pessimistic, more likely or occurring) according to specific probability values.

1) Sensitivity analysis of the intensive production system if production costs increase by 5%, holding other factors constant

A sensitivity analysis was conducted in the event of an increase in production costs of 5% with all other factors remaining constant. Tables (4) and (5) show that the benefit (revenue)/cost ratio (B/C) in the first year of the study at the discount prices of 22% and 25% amounted to about 1.036 and 1.033 for each of them, respectively, which confirms the feasibility of the project, as the ratio of benefits (revenues) to costs is greater than the correct one, which means that every pound invested in the project achieves a net return estimated at about 0.036 and 0.033 pounds for each of them in order. The net current cash flow or net present value of the project (NPV) amounted to about 9012 and 8796 pounds for each of them, respectively. The project's internal rate of return (IRR) was about 31%, which means that the rate of return is greater than the opportunity cost prevailing in society when the study was conducted, which is the interest rate of 25%. From the above the project is economically feasible under the intensive production system.

2) Sensitivity analysis of the semi-intensive production system if production costs increase by 5%, holding other factors constant

Tables (4) and (5) also show that the benefit (revenue)/cost ratio (B/C) in the first year of the study at the discount prices of 22% and 25% amounted to about 1.036 and 1.033 for each of them, respectively, which confirms the feasibility of the project, as the ratio of benefits (revenues) to costs is greater than the correct one, which means that every pound invested in the project achieves a net return estimated at about 0.036 and 0.033 pounds for each of them in order.

Table 4: The present value of revenues and costs at the discount rates of 22% and 25% when costs increase by 5%.

Production system	Total costs in pounds	Total revenues in pounds	Discount factor 22%	Discount factor 25%	Present value of costs at 22%	Present value of revenue at 22%	Present value of costs at 25%	Present value of revenue at 25%
	334895.4	345890	0.820	0.800	274504.4	283516.4	267916.3	276712.0
Intensive	Total in pounds				274504.4	283516.4	267916.3	276712.0
	B/C Ratio				1.036	1.033		
	334895.4	345587.6	0.820	0.800	274504.4	283268.5	267916.3	276470.1
Semi-intensive	Total in pounds				274504.4	283268.5	267916.3	276470.1
	B/C Ratio				1.036		1.031	

Source: Collected and calculated from Table (1); questionnaire form.

Table 5: The present value of net cash flow at the discount rates of 22% and 25% when costs increase by 5%.

Production system	Total costs in pounds	Total revenues in pounds	Net cash flow	Discount factor 22%	Discount factor 25%	The present value of net cash flow at 22%	The present value of net cash flow at 25%
	334895.4	345890	10994.6	0.820	0.800	9012	8796
Intensive	Total in pounds					9012	8796
	Internal rate of return (IRR)					31%	
	334895.4	345587.6	10692.2	0.820	0.800	8764	8554
	Total in pounds					8764	8554
Semi-intensive	Internal rate of return (IRR)					30.5%	

Source: Collected and calculated from Table (1); questionnaire form.

The net current cash flow or net present value of the project (NPV) amounted to about 8764 and 8554 pounds for each of them, respectively. The project's internal rate of return (IRR) was about 30.5%, which means that the rate of return is greater than the opportunity cost prevailing in society when the study was conducted, which is the interest rate of 25%. From the above the project is economically feasible under the intensive production system.

3) Sensitivity analysis for the intensive production system in the event of a 5% reduction in revenues, holding all other factors constant

A sensitivity analysis was performed by reducing revenues by 5%, holding all other factors constant. Tables (6) and (7), show that the benefit (revenue)/cost ratio (B/C) (in the first year of the project) at the discount rates of 22% and 25% amounted to about 1.029 and 1.033 for each of them, respectively, which confirms the feasibility of the project, as The ratio of revenues to costs is greater than one, which means that every pound invested in the project achieves a net return estimated at 0.029 and 0.033 pounds for each of them, respectively. The current net cash flows and

the project's net current value (NPV) amounted to about 7908 and 7718 pounds for each of them, respectively.

The project's internal rate of return (IRR) was about 29%, which means that the rate of return is greater than the opportunity cost prevailing in society when the study was conducted, which is the interest rate of 25%. From the above the project is economically feasible using the intensive production system.

4) Sensitivity analysis for the semi-intensive production system in the event of a 5% reduction in revenues, holding all other factors constant

Tables (6) and (7), also show that the benefit (revenue)/cost ratio (B/C) (in the first year of the project) at the discount rates of 22% and 25% amounted to about 1.035 and 1.294 for each of them, respectively, which confirms the feasibility of the project, as The ratio of revenues to costs is greater than one, which means that every pound invested in the project achieves a net return estimated at 0.035 and 0.294 pounds for each of them, respectively.

Table 6: The present value of revenues and costs at the discount rates of 22% and 25% when revenues are reduced by 5%.

Production system	Total costs in pounds	Total revenues in pounds	Discount factor 22%	Discount factor 25%	Present value of costs at 22%	Present value of revenue at 22%	Present value of costs at 25%	Present value of revenue at 25%
	318948	328596	0.820	0.800	261433	269341	255158	262876
Intensive	Total in pounds				261433	269341	255158	262876
	B/C Ratio				1.029		1.033	
	318948	328308	0.820	0.800	261433	269105	255158	262647
Semi-intensive	Total in pounds				261433	269105	255158	262647
	B/C Ratio				1.035		1.294	

Source: Collected and calculated from Table (1); questionnaire form.

Table 7: The present value of net cash flow and the internal rate of return at the discount rates of 22% and 25% when reducing revenue by 5%.

Production system		Total costs in pounds	Total revenues in pounds	Net cash flow	Discount factor 22%	Discount factor 25%	The present value of net cash flow at 22%	The present value of net cash flow at 25%
		318948	328596	9648	0.820	0.800	7908	7718
Intensive	Total in pounds						7908	7718
	Internal rate of return (IRR)						29%	
		318948	328308	9360	0.820	0.800	7672	7488
	Total in pounds						7672	7488
Semi-intensive	Internal rate of return (IRR)						30%	

Source: Collected and calculated from Table (1); questionnaire form.

The current net cash flows and the project's net current value (NPV) amounted to about 7672 and 7488 pounds for each of them, respectively.

The project's internal rate of return (IRR) was about 30%, which means that the rate of return is greater than the opportunity cost prevailing in society when the study was conducted, which is the interest rate of 25%. From the above the project is economically feasible using the intensive production system.

CONCLUSION

The benefit/cost ratio (B/C ratio) in the first year of the project at the discount rates of 22% and 25% was greater than one using both intensive and semi-intensive production systems, which confirmed the feasibility of rearing Zaraibi goats under any one of the two systems for meat production. The results of the financial analysis also showed that rearing Zaraibi goat under the intensive production system was more profitable (i.e., higher NPV and IRR) than this under the semi-intensive one.

REFERENCES

Abd El-Aal, M.A.G., Abd El-Hameed, S.A. and El-Shazly, S.S.A. (**2022**). FINANCIAL AND ECONOMIC EVALUATION OF ONE OF THE HORIZONTAL EXPANSION PROJECTS IN MINYA GOVERNORATE. Journal of Environmental Sciences **51**, 57-75. DOI: 10.21608/JES.2023.176702.1409

Attia, K.M.K. (**2008**). Economic Feasibility Studies. Center for the Development of Postgraduate Studies and Research, Faculty of Engineering, Cairo University, Cairo, pp (**5**) and (75-95).

Barakat IAH, Salem LM, Daoud NM, et al (**2017**). Genetic polymorphism of candidate genes for fecundity traits in Egyptian sheep breeds. Biomedical Research **28**, 851-857. https://rb.gy/4qm887

EL-Hanafy AA, El-Saadani MA (**2009**). Fingerprinting of FecB gene in five Egyptian sheep breeds. Biotechnology in Animal Husbandry **25**, 205-212. https://doiserbia.nb.rs/Article.aspx?ID=1450-91560904205E

El-Malky OM, Mostafa TH, Ibrahim NH, et al (**2019**). Comparison between productive and reproductive performance of Barki and Ossimi ewes under Egyptian conditions. Egyptian Journal of Sheep and Goat Sciences 14, 61 – 82. https://doi.org/10.21608/EJSGS.2019.32573

Fitzhugh, H.A. (**1978**). Bio-economic analysis of ruminant production systems. Journal of Animal Science, **46**: 797-806.

Fois, N.; S. Ligios; G. Molle; M. Sitzia, M. Decandia and L. Sanna (**1999**). Dairy sheep farming in Sardinian irrigated lowlands. Options Méditerranéennes. Série A, Séminaires Méditerranéens, **38**: 219-222.

Galal, E.S.E.; A.M. Ahmed; A.I. Abdel-Aziz and A.A. Younis (**1993**). Effect of increasing lambing frequency and crossbreeding on performance of sheep production systems in semi-arid environments. Small Ruminant Research, **10**: 143-152.

Galal, E.S.E.; H.R.M. Metawi; A.M. Aboul-Naga and A.I. Abdel-Aziz (**1996**). Performance of and factors affecting the small-holder sheep production system in Egypt. Small Ruminant Research, **19**: 79-102.

Galal S, Abdel-Rasoul F, Anous MR and Shaath I (**2005**). On-station Characterization of Small Ruminant Breeds in Egypt. In: Characterization of Small Ruminant Breeds in West Asia and North Africa, **2**: 141-193.

International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria. Luis Iniguez (Ed.) https://cgspace.cgiar.org/handle/10568/66656

Jaouen, J.C. (**2004**). Discovering the dairy farm of Andalusia. Le Chèvre, **262**: 15-27.

Karanjkar, L.M.; M.A. Abdul Hakim and G.R. Patil (**2000**). Performance of Osmanabadi goats reared under three management system. 7th International Conference on Goats. pp. 346-348. (in France).

Klosterman, E.W. (**1972**). Beef cattle size for maximum efficiency. Journal of Animal Science, **34**: 875-880.

Lebbie SHB (**2004**). Goats under household conditions. Small Ruminant Research **51**, 131-136.
https://doi.org/10.1016/j.smallrumres.2003.08.015

Lohani M, Bhandari D (**2021**). "The Importance of Goats in the World". Professional Agricultural Workers Journal **6**, 9-21.
https://tuspubs.tuskegee.edu/pawj/vol6/iss2/4

Mahgoub O, Lodge GA (**1996**). Growth and body composition in meat production of Omani Batina goat. Small Ruminant Research **19**, 233-246.
https://doi.org/10.1016/0921-4488(95)00762-8

Mahrous KF, Hassanane M, Shafey HI, et al (**2016**). Association between single nucleotide polymorphism in ovine Calpain gene and growth performance in three Egyptian sheep breeds. Journal of Genetic Engineering and Biotechnology **14**, 233–240.
https://doi.org/10.1016/j.jgeb.2016.09.003

Metawi, H.R.; H.M. Kandil and H.M. El-Shaer (**1999**). Sheep productivity under extensive and semi-intensive production systems in Egypt. Options Méditerranéennes. Série A, Séminaires Méditerranéens, 38 : 239-243.

Mourad, M. (**1986**). Contribution à la connaissance des populations caprines dans les systèmes sylvopastoraux méditerranées. Thèse de doctorat. Ingénier, Université de Paris-Sud, Centre D'Orsay, France.

Nassar, S.Z. (**1995**). Financial, economic and social evaluation of projects. Academic Library, Cairo, p. (**31**).

NRC. (**1995**). National Research Council, Nutrient requirements of goats. 5th Rev. ed. National Academy of Sciences, press 2101 Constitution Avenue, N.W. Washington, D.C. 20418.

NRC (**2002**). Nutrient Requirements of Sheep. 6th Rev. Ed., National Academy of Sciences, National Research Council, Washington, DC., USA, p 146.

Pandy, I.M. (**1981**). Financial Management, 2nd Revised Edition, VIKAS. Publishing House, PVTLTD, pp. 300-350.

Ramanaian, J.U.; J. Ramprasad and N. Singh (**1998**). Comparative evaluation of kids and lambs fed on cottonseed hulls and poultry waste-based concentrate mixture. Indian Journal of Animal Nutrition, **15(12)**: 25-29.

Seré, C. and H. Stainfeld (**1996**). World livestock production systems: current status, issues and trends. FAO Animal Production and Health. Paper **121**, FAO: Rome.

Spedding, C. R. W. (**1988**). Introduction to Agricultural Systems. Second Edition; Elsevier Applied Science

الملخص العربي

التقييم المالي لتربية سلالة الماعز الزرايبي في ظل نظامين إنتاجيين

محمد رضا إسماعيل عانوس١، إبراهيم علي محمد عبد الفتاح*٢

١قسم الإنتاج الحيواني، كلية الزراعة، جامعة عين شمس، ص. ب. ٦٨ حدائق شبرا، ١١٢٤١ القاهرة، مصر.

٢قسم الاقتصاد الزراعي، كلية الزراعة، جامعة عين شمس، ص. ب. ٦٨ حدائق شبرا، ١١٢٤١ القاهرة، مصر.

تم أخذ ستة وستين جدياً من كلا الجنسين من نسل عشرين عنزة من سلالة الماعز الزرايبي من قطيع تجريبي واستخدموا لتقييم ربحية نظامين إنتاجيين، مكثف وشبه مكثف، لإنتاج اللحوم. تم استخدام نسبة العائد إلى التكلفة (B/C ratio) ، والقيمة الحالية الصافية (NPV)، ومعدل العائد الداخلي (IRR) في التحليل المالي. كما تم إجراء تحليل حساسية عند أسعار الخصم ٢٢% و٢٥% في حال زيادة أو انخفاض تكاليف الإنتاج ٥% مع بقاء جميع العوامل الأخرى ثابتة.

أظهرت نتائج التقييم المالي للماعز الزرايبي المرباة بنظام الإنتاج المكثف أن نسبة العائد إلى التكلفة (B/C ratio) في السنة الأولى للمشروع عند أسعار الخصم ٢٢% و٢٥% بلغت نحو ١,٠٨٠ و١,٠٨٤ لكل منهما على التوالي، وأما بالنسبة للماعز المرباة بنظام الإنتاج شبه المكثف فقد أظهرت النتائج أن نسبة العائد إلى التكلفة بلغت نحو ١,٠٨٤ و١,٠٨٠ لكل منهما على التوالي. كما بلغت القيمة الحالية الصافية للمشروع (NPV) بمعدلات خصم ٢٢% و٢٥%، ٢٢,٠٨٤ و٢١,٥٥٤ ألف جنيه مصري لكل منهما على التوالي في ظل نظام الإنتاج المكثف وكانت ٢١,٠٩٨ و٢٠,٥٩٢ ألف جنيه مصري لكل منهما على التوالي في ظل نظام الإنتاج شبه المكثف. وبلغ معدل العائد الداخلي للمشروع (IRR) حوالي ٣٣% في حالة نظام الإنتاج المكثف وحوالي ٣٢% في حالة نظام الإنتاج شبه المكثف. ويمكننا أن نستنتج أن تربية الماعز الزرايبي لإنتاج اللحوم في ظل نظام الإنتاج المكثف كانت أكثر ربحية (أي أعلى قيمة حالية صافية وأعلى عائد داخلي) من ذلك في ظل نظام الإنتاج شبه المكثف. وأكد تحليل الحساسية الذي أجري في حالة زيادة أو انخفاض تكاليف الإنتاج بنسبة ٥% أن المشروع مجد اقتصاديًا لنظامي الإنتاج.

الكلمات المفتاحية: الماعز الزرايبي؛ أنظمة الإنتاج الحيواني؛ التقييم المالي.