



RESEARCH ARTICLE

Economic evaluation of livestock enterprises supported by the expert hands project in rural areas

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Kırsal alanda uzman eller projesi ile desteklenen hayvancılık işletmelerinin ekonomik açıdan değerlendirilmesi

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Öz

Amaç: Bu çalışma ile uzman eller projesi ile desteklenen büyükbaş ve küçükbaş hayvancılık işletmelerinin maliyet ve gelir unsurlarının ortaya konulması ve işletmelerin yıllık kar-zarar durumlarına ilişkin ekonomik analiz yapılması amaçlanmıştır.

Gereç ve Yöntem: Çalışmanın ana materyalini, uzman eller projesinden 2021 yılında faydalanan 50 girişimciden, çevrimiçi anket uygulamalarına katılmayı kabul eden 18 büyükbaş, 18 küçükbaş işletmesi olmak üzere toplamda 36 işletmeden temin edilen birincil veriler oluşturmaktadır.

Bulgular: Elde edilen bulgulardan; işletmelerde maliyeti oluşturan başlıca unsurların %39,46'sını yem masraflarının, bunu sırasıyla iş gücü (%33,48), elektrik-su (%6,45), canlı demirbaş amortismanı (%6,25) ve veteriner-sağlık hizmetleri (%5,08) maliyetlerinin oluşturduğu belirlenmiştir. Büyükbaş işletmelerin ortalama 1.781 TL, küçükbaş işletmelerin ise ortalama 17.281 TL kar elde ettiği tespit edilmiştir.

Öneri: Uygulanan bu proje kapsamında, özellikle kırsal alanda hayvancılık faaliyetlerinin eğitilmiş ve alanında uzman girişimciler tarafından yapılmasının işletmelerin karlılık ortalamalarına olumlu etkisi olduğunu söylemek mümkündür.

Anahtar kelimeler: Büyükbaş, ekonomik analiz, uzman eller projesi, küçükbaş

Abstract

Aim: With this work; it is aimed to reveal the cost and income factors of cattle and small ruminant enterprises supported by the expert hands project and to make an economic analysis of the annual profit-loss status of the enterprises.

Materials and Methods: The main material of the study consists of the primary data obtained from 50 entrepreneurs who benefited from the expert hands project in 2021 and from 36 enterprises in total, 18 of which are cattle and 18 of small ruminant enterprises that accepted to participate in online survey applications.

Results: From the findings; feed costs account for 39.46% of the main factors that make up the cost in enterprises, followed by labor (33.48%), electricity-water (6.45%), live fixture depreciation (6.25%) and veterinarian-health (5.08%) costs were determined. It has been determined that cattle enterprises make an average of 200,56 \$ profit, and small ruminant enterprises make an average of 1946,06 \$ profit.

Conclusion: Within the scope of this project implemented, it is possible to say that the fact that livestock activities are carried out by trained and expert entrepreneurs, especially in rural areas, has a positive effect on the average profitability of enterprises.

Keywords: Cattle, economic analysis, expert hands project, small ruminant

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Introduction

Rural areas are where the population carries out its economic activities with agriculture and animal husbandry, where life is more dependent on natural conditions, and has more limited opportunities. A significant part of the population in Turkey lives in rural areas and finds work in the agriculture and livestock sectors. The unequal distribution of income and welfare levels of the people in this region and their lower share of the national income has been an ongoing problem for years (Beşen et al 2021).

When the structure of the rural sector in Turkey is examined, it is seen that the average age of the population is increasing gradually. The main reasons for the increase in migration from rural to urban are listed as: the increase in mechanization in agriculture in rural areas, the inability of the young population to make a living in the agriculture and livestock sector, inadequacies in a social and cultural sense, etc. It is obvious that bringing an educated and specialized young population to rural areas plays an important role in providing a sustainable structure in the agriculture and livestock sector in Turkey (Unakitan and Başaran 2018, Bozkoyun 2022).

In Turkey, since the establishment of the Republic, many policies have been developed and implemented in order to increase the income and welfare of people living in rural areas and to improve their living conditions. One of the most important resources in the hands of the states in order to reach the targets set in these policies is to support the sectors. Especially with the effect of the pandemic that has affected the world recently, support for the agriculture and livestock sector is important in terms of ensuring sustainability in animal husbandry (Gökhan 2019; Satar and Sakarya 2021). On the other hand, practices such as importing animals and animal products are reported to cause economic and social problems in rural and urban areas by causing livestock enterprises to withdraw from production (Akin et al., 2020). One of the last projects implemented within the scope of rural development policies was the "Expert Hands Project". The Expert Hands project aims to provide employment to the young population who live in rural areas or undertake to live in this area, graduate from colleges and universities, provide relevant education (agriculture, animal husbandry, forestry, food and aquaculture), and by supporting the entrepreneurship of the young population who are experts in their fields in these sectors. It is a project that provides grant support in order to encourage livestock activities to be carried out by qualified and educated people, to increase the amount, quality and efficiency of production, and to make the activities of these rural enterprises sustainable (TC Resmi Gazete 2021a).

The Expert Hands project was implemented as a pilot in the

provinces of Düzce, Amasya, İzmir and Mardin in 2020, and a total of 1102272,73 \$ support was provided to 98 project owners in this context. Due to the success and satisfaction achieved as a result of the implementation of the project, the decree regarding the implementation of the Expert Hands project in 81 provinces between 2022-2024 was signed on 1 June 2021 and entered into force in the Official Gazette (TC Resmi Gazete 2021b).

Although the effects of the projects within the scope of rural development programs will be revealed more clearly in the long term, studies that include the evaluation of the results of the projects from various perspectives (socio-economic, economic, etc.) will be a source for the impact analysis studies that can be studied later. This study aims to determine the cost and income factors of the cattle and small ruminant enterprises supported by the "Expert Hands Project" in Turkey and to evaluate the project's economic impact by revealing their average profit/loss situation.

Material and Methods

Within the scope of the research, a total of 50 entrepreneurs, 29 of which are cattle breeders and 21 of which are small ruminant breeders, benefiting from the expert hands project in Düzce, Amasya, İzmir and Mardin, which were determined as pilot provinces throughout Turkey, by the full census method. The data of the study were collected by using online questionnaires with the beneficiaries of 36 projects, 18 of which were cattle and 18 of which were small ruminants and who agreed to participate in the study.

The material of the research was the data of the production period of 2021, which was obtained by getting data in electronic platform from entrepreneurs who implemented expert hands project. Considering the breeding type of the producers, the cost factors and income items that make up the total cost have been determined (Gökdağ and Sakarya 2020, Arıkan 2021, Mat and Cevger 2022). The following formula was used to calculate the sum of costs and the profit-loss situation (Tamer and Sarıözkan 2017);

$$\text{Total cost} = \text{Grand total of costs} - \text{Subsidiary incomes}$$

$$\text{Profit-Loss} = \text{Total income} - \text{Total cost}$$

Simple, descriptive and illustrative statistical analyzes were carried out with the SPSS 25 version package program (IBM Corp. Released 2017).

Within the scope of the project, the values of the animals purchased by the beneficiaries in 2020 and their nominal and real changes after 18 months were calculated. While the

nominal value increase is calculated over the current animal prices of that year's purchase period, for the determination of the real value increase, it has been taken into account the inflation rates of the Central Bank of Turkey and the income increase has been adjusted for inflation (TC Merkez Bankası 2022a). In order to protect the increase in animal values from the effects of inflation, the calculation of the increase in value adjusted for inflation was made according to the formula below (Satar 2021):

$$\text{Real Income Increase (r)} = (1 + \text{nominal rate of increase}) / (1 + \text{inflation rate}) - 1$$

In calculating the real income increase, the period when live fixtures were purchased most intensively within the scope of the project (based on May 2020) was used and inflation calculations were made according to the data of November 2021.

Results

Within the scope of the study, the cost factors that make up the total cost according to the type of breeding are presented in Table 1.

Table 1 shows that the feed costs were the main cost factor in the enterprises with a ratio of 39.46%. Labor costs, electricity-water costs, live fixture depreciation, veterinarian-health cost, general administrative expenses and other costs, loan interest, building cost, insurance and machinery-equipment cost were followed by respectively, with the rate of 33.48%, 6.45%, 6.25%, 5.08%, 3.5%, 3.33%, 2.28%, 2.14% and 0.83%.

When Table 2 is examined, the highest income factor is milk and dairy products sales with the rate of 50.05%. In small ruminant breeding it is noteworthy that the highest income

Table 1. Distribution of cost factors that make up total costs in enterprises (%)

Breeding type	Feed cost	Labor cost	Veterinarian-health cost	Electricity-water cost	Loan interest	General Administration and Other Costs	Insurance cost	Building cost	Machinery - Equipment cost	Live Fixture Depreciation
Cattle	43,97	32,34	5,03	3,89	2,96	2,6	1,72	1,99	0,92	4,59
Small ruminant	33,53	34,97	5,15	3,36	3,82	4,69	2,68	2,66	0,72	8,42
Average	39,46	33,48	5,08	6,45	3,33	3,50	2,14	2,28	0,83	6,25

Table 2. Distribution of incomes obtained in enterprises according to the type of breeding (%)

Breeding type	Grants	Milk, cheese and yoghurt income	Fleece income	Other incomes (fertilizer,sack)	Inventory value increase	Lamb/kid calf income
Cattle	1,95	50,05	0	2,25	32,11	13,63
Small ruminant	1,74	6,68	0,21	2,23	69,80	19,34
Average	1,85	29,78	0,1	2,24	49,73	16,30

Table 3. Annual cost, incomes and profit-loss in enterprises

Breeding type	Total cost (\$)	Total income (\$)	Profit-Loss (\$)
Cattle	15349,32±2755,69	15691,25±6526,70	200,56
Small ruminant	11697,75±2537,84	13643,81±437,78	1946,06

*1\$=8.88 TL (2021)



Table 4. Values of animals in enterprises and their change over the years

Years	Cattle Breeding		Small Ruminant Breeding	
	2020	2021	2020	2021
Animal value*	\$ 255743,24	\$ 330423,42	\$ 233529,28	\$ 304249,44
Unadjusted for Inflation (Nominal) Value Increase **	100	129,2	100	130,28
Inflation*** Inflation Adjusted (Real) Value Increase	100	126,86	100	126,86
****	100	101,84	100	102,69

*The animal value for 2020 is obtained by multiplying the number of enterprises benefiting from the project and the amount of grants given per enterprise. Animal values for the year 2021 are obtained by multiplying the animal numbers in the enterprise with the animal values at the time that data was obtained.** It is a calculation based on nominal values without adjusting for the effect of inflation.*** Calculated using the Central Bank of Turkey's inflation tool, based on September 2020 -when the animals were predominantly distributed-, and according to the inflation rates of December 2021.**** When the central bank of Turkey's inflation data is adjusted, it shows the percentage increase in animal value based on 2020.

factor was the increase in inventory value with the rate of 69.8%. The largest share in average incomes was determined as inventory value increase with the ratio of 49.73%, milk income at 29.78%, new lamb/kid or calf income at 16.3%, and other incomes with 2.24%

The annual cost, incomes and profit-loss status of the enterprises examined within the scope of the study are presented in Table 3.

Table 3 shows that, while the average annual profit in cattle breeding enterprises is 200,56 \$, the annual profit in small ruminant enterprises is 1946,06 \$, and it is observed that livestock enterprises make an annual profit of 1073,31 \$ in general average.

Within the scope of the project, the values of the animals provided by the entrepreneurs through grants during the purchase period and the change in these values in the period when the data were obtained were calculated. The values of the animals in the enterprises benefiting from the project in expert hands and their changes according to the years are presented in Table-4.

When Table-4 is examined, it is seen that the amount of grants that were given to the enterprises for the purchase of live fixtures in October 2021 nominally increased from 100 units to 130.28 units in small ruminant breeding enterprises, and from 100 units to 129.2 units in cattle breeding enterprises. According to the data of the Central Bank of Turkey, it is seen that there is an inflation rate of 26.86% between May 2020 and October 2021, when the data is provided. In the light of these values; the increase in livestock values in small ruminant breeding projects is 30.28%. If the real value increase is calculated by excluding the inflation effect, it is seen that;

$$r = (1+0,3028) / (1+0,2686) - 1 \quad r = 2,69 \%$$

The increase in livestock values in cattle breeding projects is 29.20%. If the real value increase is calculated by excluding the inflation effect, it was determined;

$$r = (1+0,2920) / (1+0,2686) - 1 \quad r = 1,84 \%$$

As a result, when compared to 2020, the nominal value increase of 30.28% in small ruminant breeding projects is 2.69% in real terms and it has been determined that the nominal value increase, which is seen as 29.2% in cattle breeding projects, is 1.84% in real terms.

Discussion

In a study on the implementation and sustainability of the Young Farmer Project in Antalya, it was determined that only 20.5% of the interviewed producers received training on agricultural production activity (Alkan and Özkan 2020). In another study conducted by Yılmaz and Keskin (2020), they determined that the rate of university graduate owners in cattle and small ruminant enterprises benefiting from the Hatay Province Young Farmer Project is 3.9% in sheep enterprises and 5% in cattle enterprises.

The fact that the rate of university graduates is low in the studies carried out is due to the fact that primary school graduates get higher scores in the evaluation criteria of the young farmer project. However, the low level of general education in livestock enterprises in Turkey has been demonstrated by many studies (Gökdağ and Sakarya 2019, Özsayın and Everest 2019, Sever et al 2017, Çelik and Sarıözkan 2017, Satar and Sakarya 2021).





It is known that as the producers' education level increases, the enterprises' profitability increases. One of the important factors in the increase of profitability is that with the increase in the level of education, enterprises can adapt more easily to innovations (Köknaroğlu et al 2017). In some studies, it has been revealed that there is a positive relationship between education level and adaptation to innovations and technology (Adesina and Chianu 2002, Abdullah and Samah 2013, Vecchio et al 2020).

In this study, it is predicted that there is a positive relationship between education level and enterprise profitability within the scope of supporting educated and expert entrepreneurs in rural areas, which is one of the main objectives and mandatory application conditions of the Expert Hands Project.

In a study conducted in Çanakkale, it was reported that the highest cost factors in the Saanen goat enterprises are feed costs with the ratio of 46.22%, following by labor costs with the ratio of 27.19%, fuel costs with 5.44% and veterinarian-health cost with 5.19% (Gökdağ and Sakarya 2019). In a study conducted in the sheep enterprises in Yozgat, the cost factors were determined as feed costs with the ratio of 59.5%, labor cost with 23.2%, veterinarian-health cost with 6%, loan interest with 0.5% and other costs with 2.1%. The total rate of variable costs was determined as 91.3%. Fixed cost factors that make up 8.7% of the total costs were determined as general administrative cost with the ratio of 2.7%, depreciation cost with 3.3% and maintenance and repair cost with 2.7% (Sarıözkan and Tamer 2017).

In a study examining the socio-economic effects of the young farmer project in sheep and goat enterprises; while 40.2% of feed costs took the first place among the cost factors that make up the total cost, labor costs were in the second place with the ratio of 26.8%, and veterinarian-health cost were in the third place with the ratio of 4.5% (Satar and Sakarya 2021). In the findings of our study, it is seen that the average feed costs within the cost factors are lower compared to other studies, especially in small ruminant enterprises. In this case, it is thought that the existence of the lands belonging to the small ruminant enterprises within the scope of the project and their effective use may have an impact, and the enterprises can achieve a more sustainable structure in terms of profitability by minimizing the feed costs, which constitute an important part of the cost factors. It is possible to say that the other cost factors in our study are largely similar to the other research findings (Tamer and Sarıözkan 2017; Mat and Cevger 2022)

When the income factors of the enterprises are examined; it is observed that the largest ratio in total income in cattle enterprises is milk income with the ratio of 50.05%, while in

small ruminant enterprises that is an increase in inventory value by 69.80%. The fact that the dairy industry in Turkey operates as a dynamic production branch allows the milk produced by cattle breeders to be evaluated economically (Akin and Cevger 2020).

The average total income of small ruminant enterprises is lower than cattle enterprises, but when the net profit/loss ratios are examined, it is seen that small ruminant enterprises operate more profitably. This situation shows that small ruminant enterprises turn the inventory value change, -which is the main income factor, into an advantage, the enterprises tend to grow and benefit from the Expert Hands Project effectively.

Another indicator of this is that the amount of grants that were given to enterprises and purchased live fixtures in October 2021 nominally increased from 100 units to 130.28 units in small ruminant breeding enterprises. It has been determined that the increase in livestock values is 30.28%, and this value is 2.69% when the real value increase is calculated by excluding the inflation effect. On the other hand, in cattle breeding projects, the increase in livestock values is 29.20%, and when the real value increase is calculated by adjusting the inflation effect, this rate is 1.84% lower than the small ruminant projects.

In the study of Satar and Sakarya (2021), in which the socio-economic effects of the young farmer project were revealed, it was determined that the value of a total of 4,840 ovine animals given to 121 enterprises for 3378,38\$ in 2016 increased nominally by 102% in 2018. This rate was calculated as 163% in 2019. When this ratio is calculated in real terms, it is seen that this rate increased by 45.3% in 2018 and 68.7% in 2019.

Although projects are carried out by experts in their fields, the reason why these rates are lower in our study is evaluated as the fact that producer-price index is higher than consumer-price index in the study conducted in the third quarter of 2021 (TC Merkez Bankası 2022b) Since the difference between the producer-price index and consumer-price index was seen to be even higher in the following period, it is considered that even if the resources of the project are used effectively and efficiently, the increase in the costs of the producers is higher than the increase in their incomes, so the enterprises may even be in economic loss. For this reason, in addition to fighting with inflation, it would be appropriate to support livestock enterprises, -which have various difficulties and are very difficult to return to sector when they stop their activities-, with different methods if necessary.



Conclusion

Increasing population and increasing consumption per capita, pressure on natural resources, especially climate change, pose a risk in terms of providing food supply and are important in terms of ensuring the sustainability of agriculture and livestock activities, which constitute the basic livelihoods of the people in rural areas, that constitute a significant part of the population of Turkey.

In recent years, the number of supports and projects for increasing the employment of young entrepreneurs in rural areas has increased in preventing migration from rural to urban areas. Although these supports are of great importance, the fact that the support started to be given to educated and experts in the field together with the "Expert Hands Project" has been a significant step in increasing the effectiveness of the support.

However, in order to obtain maximum efficiency and profitability from projects, implementations like; i) additional support such as creating organizational models that will bring together young and educated producers, ii) increasing the market power of producers with these models, iii) developing digital marketing methods that are increasingly used in almost every sector today, should carry out to contribute to the formation of profitable and sustainable livestock investments.

As a result; rural development policies play an important role in the development of the national economy of the country, as well as contributing to the social, cultural and economic development of the society living in rural areas. In this context, the "Expert Hands Project" has been an important project which aims to contribute to the employment of the young that population graduated from colleges/universities, to encourage agricultural and livestock activities to be carried out by trained and expert people, and to be an example of sustainable investment in the rural area by increasing the production amount, efficiency and quality.

Conflict of Interest

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During this study, any pharmaceutical company which has a direct connection with the research subject, a company that provides and / or manufactures medical instruments, equipment and materials or any commercial company may have a negative impact on the decision to be made during the evaluation process of the study or no moral support.

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Ethical Approval

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