Comparison of economic analysis results of sheep and goat enterprises: the case of Konya province, Turkey

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Abstract

The animal production value is 59% of total plant and animal production value in Turkey while the 35% of this production is the value obtained from animal products. The most important of these animal products is milk with 22 million tons of production. Ovine breeding is also important for red meat production. The study aims to compare the economic analysis of the enterprises that are members of the Sheep and Goat Breeders' Association in Konya, and benefit from support within the scope of the Sheep & Goat Breeding Project in the Public Hand of Konya Province. In this regard, the basic data of the study were collected from questionnaires results collected from 74 enterprises, which were determined through the stratified random sampling method of the enterprises that perform sheep and goat breeding farms (SGF). Among the ovine livestock enterprises, 40 are sheep-breeding enterprises (SBE) and 34 are goat-breeding enterprises (GBE). Accordingly, the farms were classified according to their size as first group (1-800 sheep, 14 farms; 1-250goats, 14 farms), second group (801-1250 sheep, 13 farms; 251-500 goats, 13 farms) and third group (>1251 sheep, 13 farms; >501 goats, 7 farms). Sheep farms are generally located in lowland villages, while goat-breeding firms are mostly located in the mountainous area. As a results of the study, considering the average values of the per SBE, gross production value (GPV) was $ 220,892.46 while the average of the total varying costs is $ 83,568.15 and the gross profit is $ 137,324.31. The average gross production value per GBE is $ 59,705.16, with an average of varying costs totaling to $ 14,809.47 and gross profit of $ 44,895.69. Unit milk cost was $ 1.15 per kg and milk sales price was $1.38 per kg in SBE while these values $ 1.22 per kg and $ 1.33 per kg respectively

for GBE. They have been maintaining their sustainability as a result of their plant production activities.

Keywords: Ovine breeding. Unit milk cost. Gross profit. Konya

1. Introduction

According to TurkStat data for the year 2018, the total plant and animal production value in Turkey was 384 billion Turkish Liras, while animal production value represent 59% of total production with 225 billion Turkish Liras. 35% of animal production value comes from animal products with 79 billion Turkish Liras. Total milk production increased by 6.9% in 2018 and reached 22 million 121 thousand tons. 90.6% of this amount is composed of cow milk, 6.5% of sheep milk, 2.5% of goat milk and 0.3% of buffalo milk (Anonymous, 2019). Ovine breeding is a branch of activity that converts weak grass pastures, fallow areas, stubble, and non-vegetative areas into products such as meat, milk, wool, hair and skin. In other words, ovine breeding has the capacity to convert low quality feeds into products with a high feed value (Lombardi, 2005). Animal husbandry is the main source of income for the rural population (Offor et al., 2008). It also helps balance human nutrition as well as people's socio-cultural structures. Although cattle breeding is rather essential in agricultural production, ovine breeding, on the other hand, offers an alternative opportunity for the rural population (Panin, 2000). The ovine livestock is an important sector for farmers in terms of providing cash flow, reducing the risk of climate changes and making the most of the available resources. Therefore, mountainous and arid areas are evaluated by using traditional grazing methods in ovine breeding (Mena et al., 2005; Papachristoforou and Markou, 2006; Degen, 2007). According to FAO (Food and Agriculture Organization) data in 2017, there are a total of 2,237 million sheep and goats in the world. While sheep constitute 53.76% of this figure, goats take up 46.24%. Countries that stand out in the presence of small ruminants are China, India, Nigeria, Pakistan, and Australia, respectively. With total assets of sheep and goats owned, Turkey ranks 12th in the world (FAO, 2019). There are 46.117 pieces of small ruminants present in Turkey, 76.32% of which are sheep and 23.68% goats. With its natural and economic conditions, agricultural structures, traditions, Turkey shines out as a country to be widely convenient for sheep and goat breeding. (Kaymakçı and Engindeniz, 2010). Small ruminant breeding is a branch of activity that converts weak meadow pastures and fallow fields into crops such as meat, milk wool, hair, mohair, and skin by making good use of areas that are not convenient for stubble and vegetative production. Factors such as meadows and grasslands' being more convenient for sheep and goats, and rural factors such as the consumption habits of families in the areas, and

finally natural resources have made Turkey a favourable place for small ruminant breeding (Kaymakçı and Sönmez, 1996). The number of sheep and goats in Turkey has increased by 29.8% in the last five years. The provinces with the highest number of sheep and goats are; Van, Konya and Şanlıurfa. There are a total of 2,252 sheep and goats in the province of Konya, which constitutes our research field. 88.84 % of this number is sheep while 11.16% are goats. With the definition of ovine breeding as an alternative source of livelihood, investments in ovine breeding, besides vegetative production, have increased recently.

The aim of this study was to compare the milk production cost and the profitability of sheep and goat breeding farms (SGF) in Konya. In the milk production cost and profitability calculations of the farms, according to the purpose of the study, the farms were not evaluated as a whole, they evaluated only by taking into account the sheep and goat breeding farms production activity. At the end of the study, social and economic activity results of enterprises were compared with the results of all activities done in farm.

2. Literature Review

Livestock farming has the opportunity to create benefit in agricultural production. Especially sheep and goats come into prominence in terms of adapting to insufficient pasture areas and unfavorable climatic conditions. Ovine breeding practices and grazing have a major impact on vegetation. Pasturelands used for grazing were determined to be 20% more productive than pasture lands that were not used for grazing (Louhaich et al., 2009). There have been many studies on various aspects of ovine breeding, which have a lot of influence both in rural areas and environmentally. When looking at the literature, there seems many studies on the importance of nutrition in ovine breeding (Papanastasis et al. 2008). Efficiency of feeds (Fedele et al. 2005, Galina et al. 2007, Morand-Fehr et al. 2007), reproduction parameters (Zarazaga et al., 2005) and on economic analysis (Srour, 2006; Benoit and Laignel, 2006; Ruiz et. al. 2008; Dellal et al. 2002; Hosri and Nehme, 2006; Tzouramani et. al. 2011; Ragkos et. al. 2014; Al-Khaza'leh, 2015; Mitrovic, Knezevic et al. 2015). Particularly economic analyses stand out in terms of the sustainability of ovine breeding (Thomson & Nardone, 1999; Alassaf et al., 2012; Hadjieorgiou and Zervas, 2009; Al-Khalidi, 2013). In the study, by using certain literature about dairy farming, the value of animal and vegetable production, varying costs, fixed costs, gross production value, gross profit, agricultural income, and unit milk cost were calculated (Oğuz and Yener 2017, Yener 2017, Oğuz and Yener 2018, Örs and Oğuz, 2019).

3. Material and Methods

The main material of the study was comprised of data collected through a survey conducted on enterprises engaged in sheep and goat farming under the scope of the Sheep & Goat Breeding Project in the Public Hand of Konya Province, which was selected as the research area. In addition, previous studies and researches related to the issue and conducted by a number of institutions and foundations were availed of. The data was collected by applying the survey method to the previously mentioned enterprises during July-September 2017 period. Data of the study covered the 2016 production season and the researchers conducted the questionnaires in person. In this study, the currency rate was taken as $1=2.95 Turkish Lira (August-2016). In order to increase the accuracy of findings collected from enterprises and to ensure that different parts of the population can be represented adequately in the study, the stratified sampling method, one of the simple random sampling methods, was used (Yamane, 1967; Güneş et al., 1985). The number of enterprises, who are members of Konya Sheep and Goat Breeders' Associations and are registered in the Sheep and Goat Breeding Project in the Public Hand and received support from the project, was 178, and these enterprises make up the main population of the research. The number of sheep and goats owned by the enterprises of this population was 43,398. The survey method was applied to the enterprises that were accessible on a voluntary basis. Therefore, 74 enterprises engaged in sheep and goat farming constituted the sample size. Distribution of sample enterprises according to the number of their animals is presented in Table 1.

Table 1: Distribution of Sample Size (n) According to the Strata (number)

Sheep Farming Enterprises		Goat Farming Enterprises		The Total Sample Size (n) **74**
Farm Size Group (Head)	Sample Size (n)	Farm Size Group (Head)	Sample Size (n)	
1-800	14	1-250	14	
801-1250	13	251-500	13	
1251-+	13	501-+	7	
Total	**40**	Total	**34**	

Concerning the analysis of economic activity outcomes of the enterprises, based on data collected from the enterprises via survey method, calculations on enterprises and width

group of the enterprises in terms of the number of animals in each enterprise were conducted by calculating the arithmetic mean. Economic activity outcomes of the enterprises were assessed and interpreted based on these average values. For the enterprises assessed in the research, analyses were conducted considering land size, land ownership and form of utilization, sowing of plant according to the groups of the enterprises, population and business status of the studied enterprises, their gross production values, variable expenses, gross profit, prime cost of milk, special variable costs for a unit milk. Certain characteristics of the existing population in the enterprises, such as age, gender, educational status and labour potential, were assessed separately. Variable expenses were examined in two ways: expenses in animal production and expenses in vegetative production. Determining the variable expenses in plant production, costs of seed, fertilizer, agricultural pesticides, water, equipment, machinery, temporary labour and works done with money were calculated. In animal husbandry, variable expenses were calculated by regarding concentrate feed, rough, fodder, variable costs of tool-machinery, veterinary costs, marketing costs, electricity, water, and similar other costs. In addition, stock assets of the enterprises were converted to the Livestock Unit (LU), and one part of the evaluation was carried out according to this LU. LU is a measure of livestock and it is usually defined as equivalent to one adult dairy cow. In this paper, one sheep was considered as 0.10 LU (Erkuş et al., 1995; Toro-Mujica et al., 2011). Productive Stock Value (PSV) = (year-end stock value + value of the sold stock +value of the stock slaughtered) - (value of the stock at the beginning of year + value of the stock bought). For the enterprises, the GPV was calculated by multiplying the amount of vegetative and animal products obtained through agricultural activity with the price of products taken by the farmers, and by adding the income of the side products obtained from production branches to this value. The Gross Profit was calculated by subtracting the variable expenses from the sum of GPV of plants and animals. Relative sales value method was used to calculate milk production cost. The sum of costs incurred in the activity branches is distributed to each compound product according to their contribution to the gross production value; then, unit costs were calculated by dividing the cost of each product by the production quantity of the obtained products (Kıral et al., 1999).

4. Results and Discussion

The gross production values of the sampled enterprises were obtained by adding the productive asset value increases in vegetative and livestock production. to the value of the

goods produced in the enterprise by the farmyard prices (Erkuş, 1979; Oğuz & Bayramoğlu, 2015). The animal production values of the examined enterprises are given in table 2. The average animal production value was specified as 106,938.68 $ in sheep farming. 85.07 % of this value was obtained from Productive Stock Value (PSV), 10.68% from milk gross production value, 3.86% from farm fertilizer, 0.34% from wool value and 0.04% from animal skin sales.

Table 2: Animal production values ($) and rates (%).

Farm Size Group (Head)		Milk Production Value		PSV		Wool, Hair		Skin		Farm Manure Value		Total	Per LAU
		$	%	$	%	$	%	$	%	$	%	$	$/LAU
Sheep Enterprise	1-800	8,352.78	14.37	48,453.75	83.38	196.20	0.34	15.83	0.03	1,095.74	1.89	58,114.31	1,175.50
	801-1250	13,445.24	10.08	114,530.64	85.87	337.00	0.25	19.74	0.01	5,047.77	3.78	133,380.39	1,625.34
	1251-+	12,711.86	9.55	113,212.91	85.07	573.86	0.43	100.78	0.08	6,477.64	4.87	133,077.06	1,139.15
	Ave. of the Enterprises	11,424.54	10.68	90,975.47	85.07	364.70	0.34	44.71	0.04	4,129.27	3.86	106,938.68	1,309.81
Goat Enterprise	1-250	6,821.77	24.63	20,430.99	73.78	9.27	0.03	7.30	0.03	423.58	1.53	27,692.91	1,844.26
	251-500	13,492.83	25.93	37,968.06	72.95	13.68	0.03	28.74	0.06	540.36	1.04	52,043.66	1,725.54
	501-+	25,641.65	22.76	84,527.84	75.03	47.40	0.04	19.56	0.02	2,424.38	2.15	112,660.83	2,145.22
	Ave. of the Enterprises	13,247.15	24.31	40,332.75	74.01	18.81	0.03	18.02	0.03	880.16	1.62	54,496.89	1,860.83

The average animal production value was determined as 54,496.86 $ in the goat breeding enterprises. 74.01 % of this value was obtained from PSV, 24.31% from milk production value, 1.62% from farm fertilizer, 0.03% from wool and 0.03% from skin sales. The value of vegetative production in the research region is $ 113,953.78 in sheep farms and $ 5,208.27 in goat breeding businesses.

Table 3: Gross production value (GPV) ($) and rates (%) in the animal included in the study

Farm Size Group (Head)		Plant Production Value		Animal Production Value		Total GPV	Per Decares
		$	%	$	%	$	$/decar
Sheep Farming Enterprise	1-800	79,224.42	57.69	58,114.31	42.31	137,338.73	280.49
	801-1250	91,697.39	40.74	133,380.39	59.26	225,077.78	564.59
	1251-+	173,611.01	56.61	133,077.06	43.39	306,688.08	359.59
	Ave. of the Enterprises	113,953.78	51.59	106,938.68	48.41	220,892.46	398.53
Farming Enter	1-250	148.96	0.54	27,692.91	99.46	27,841.87	9,744.65
	251-500	7,777.94	13.00	52,043.66	87.00	59,821.60	1,004.76

	501-+	10,554.67	8.57	112,660.84	91.43	123,215.51	2,559.37
	Ave. of the Enterprises	5,208.27	8.02	59,705.16	91.98	64,913.44	4,923.61

As indicated in Table 3, 48.41% of gross production value in sheep breeding enterprises consists of animal production value and 51.59% is vegetative production value. In goat breeding enterprises, 91.98% of the gross production value is from animal production value while 8.02% of it is vegetative production value. In a similar study, 56.70% of gross production value was of animal production and 43.30% was vegetative production. (Dellal et. al. 2008). In Konya province, the total meadow and pasture area is 7.6 million decares, which constitute 40% of the total agricultural area. The only way to make good use of these areas is to breed sheep and goats (Yıldırım et. Al. 2018). Actually, as can be understood from the study, the vegetable production value is low in the gross production value of the enterprises. Varying costs in animal production per farm in sheep-breeding enterprises were calculated as $ 37,693.86 while it was calculated as $ 11,577.91 in goat-breeding businesses. In both sheep and goat farms, feed costs take the lead among the varying costs in animal production (table 4).

Table 4: Animal Production Variable costs ($) and rates (%) of animal production

		Farm Size Groups (Heads)				Farm Size Groups (Heads)			
		1-800	801-1250	1251-+	Ave. of the Enterprises	1-250	251-500	501-+	Ave. of the Enterprises
Roughage($)	$	6,520.58	11,610.17	16,013.04	11,259.75	3,395.64	4,162.97	6,205.81	4,267.60
	%	23.87	25.36	28.34	29.87	41.83	35.61	33.93	36.86
Concentrate Feed ($)	$	12,735.47	21,438.85	26,735.85	20,114.19	3,248.28	5,142.11	8,768.52	5,108.91
	%	46.61	46.83	47.32	53.36	40.02	43.98	47.94	44.13
Tool-machine Varying Costs ($)	$	-	521.51	352.02	283.90	-	13.04	169.49	39.88
	%	-	1.14	0.62	0.75	-	0.11	0.93	0.34
Veterinarian Costs ($)	$	1,295.40	2,425.03	3,279.01	2,307.20	1,245.76	1,829.20	2,372.88	1,700.90
	%	4.74	5.30	5.80	6.12	15.35	15.65	12.97	14.69
Temporary Employment ($)	$	1,915.25	4,106.91	1,277.71	2,420.34	-	-	-	-
	%	7.01	8.97	2.26	6.42	-	-	-	-
Marketing Costs ($)	$	115.01	492.83	99.09	232.63	87.17	122.56	309.93	146.56
	%	0.42	1.08	0.18	0.62	1.07	1.05	1.69	1.27
Other (Electric. Water etc.) Costs ($)	$	949.15	1,569.75	718.38	1,075.85	140.44	421.12	462.47	314.06
	%	3.47	3.43	1.27	2.85	1.73	3.60	2.53	2.71
Other Varying Costs ($)	$	23,530.87	42,165.06	48,475.10	37,693.86	8,117.29	11,691.00	18,289.10	11,577.91

Per LAU	$/LAU	496.77	513.81	414.95	475.72	540.59	387.62	348.25	442.50

Varying costs in animal production per livestock unit (LAU) in sheep farming enterprises is $ 475.72. Varying costs per animal in sheep farming businesses in the United States was calculated as $ 124.44 (Williams and Anderson, 2016). In another study, the largest share among the varying costs was found to be the feed cost with 59.50% (Tamer & Sarıözkan, 2017). Varying costs in animal production per animal unit in goat breeding enterprises is $ 442.50. As indicated in Table 5, the total annual varying costs per enterprise in the sheep farming enterprises were calculated as $ 83,568.12.

Table 5: Total of the variables costs ($) and rates (%)

Farm Size Group (Head)		Variable Cost in Animal Production		Variable Cost in Plant Production		Total Variable Cost	Per LAU	Per Decares
		$	%	$	%	$	$/LAU	$/decar
Sheep Enterprise	1-800	23,530.87	39.10	36,648.55	60.90	60,179.42	1270.47	122.91
	801-1250	42,165.06	53.57	36,544.59	46.43	78,709.65	959.14	197.44
	1251-+	48,475.10	42.67	65,139.31	57.33	113,614.41	972.55	133.21
	Ave. of Enterp.	37,693.86	45.11	45,874.26	54.89	83,568.12	1072.46	150.48
Goat Enterprise	1-250	8,117.29	98.44	128.31	1.56	8,245.60	549.13	2,885.96
	251-500	11,691.00	66.86	5,793.77	33.14	17,484.77	579.72	293.67
	501-+	18,289.10	79.63	4,679.71	20.37	22,968.81	437.36	477.10
	Ave.of Enter.	11,577.91	78.18	3,231.69	21.82	14,809.60	537.81	1,398.85

45.11% of this value consists of varying costs for animal production and 54.89% of the costs are varying costs for vegetative production. In the goat breeding enterprises, the total annual cost per enterprise was calculated as $ 14,809.60. 78.18% of this value consists of varying costs for animal production and 21.82% are for varying costs for vegetable production.

Table 6: Fixed cost ($) and relevant rates (%)

Farm Size Group (Head)		Depreciation Costs		Building Repair-Maintenance Costs		Permanent Labour		Family Labor Reserve		Total	Per LAU	Per Decares
		$	%	$	%	$	%	$	%	$	$	$/decar
Sheep Farming Enterpris	1-800	29,187.59	50.45	874.09	1.51	11,012.11	19.03	16,779.66	29.00	57,853.45	1,221.37	118.15
	801-1250	39,144.30	54.89	1,318.12	1.85	11,139.50	15.62	19,713.17	27.64	71,315.10	869.03	178.89

	1251-+	48,673.12	55.38	812.26	0.92	14,988.27	17.05	23,409.39	26.64	87,883.02	752.28	103.04
	Ave. of the Enterprises	38,756.32	53.84	998.31	1.39	12,345.76	17.15	19,887.71	27.63	71,988.10	954.40	132.98
Goat Farming Enterprise	1-250	6,028.37	34.16	832.93	4.72	435.84	2.47	10,351.09	58.65	17,648.22	1,175.32	6,176.88
	251-500	11,077.94	38.58	1,003.91	3.50	2,941.33	10.24	13,689.70	47.68	28,712.88	951.99	482.26
	501-+	21,638.45	47.33	968.52	2.12	7,496.37	16.40	15,617.43	34.16	45,720.77	870.59	949.69
	Ave. of the Enterprises	11,172.93	40.40	926.22	3.35	2,847.46	10.30	12,711.86	45.96	27,658.47	1,027.19	2,923.34

As indicated in Table 6, the total annual fixed costs were determined as $ 71,988.10 per enterprise in sheep farming and $ 27,658.47 in goat breeding enterprises.

Table 7: Total production costs ($) and relevant rates (%) in the research area

Farm Size Group (Head)		Total Variable Cost		Total Fixed Cost		Total Production Cost	Per LAU	Per Decares
		$	%	$	%	$	$	$/decar
Sheep Enterprise	1-800	60,179.42	50.99	57,853.45	49.01	118,032.87	2,491.83	241.06
	801-1250	78,709.75	52.46	71,315.10	47.54	150,024.85	1,828.17	376.33
	1251-+	113,614.41	56.39	87,883.02	43.61	201,497.43	1,724.83	236.25
	Ave. of the Enterprises	83,568.15	53.72	71,988.10	46.28	155,556.25	2,026.87	283.46
Goat Enterprise	1-250	8,245.59	31.84	17,648.22	68.16	25,893.81	1,724.45	9,062.83
	251-500	17,484.77	37.85	28,712.88	62.15	46,197.65	1,531.71	775.93
	501-+	22,968.81	33.44	45,720.77	66.56	68,689.59	1,307.95	1,426.79
	Ave. of the Enterprises	14,809.47	34.87	27,658.47	65.13	42,467.94	1,565.00	4,322.18

Annual sheep cost per farm was calculated as 155,556.25 $ in sheep farming. 53.72% of this value consists of varying costs while 46.28% are fixed costs. In the goat breeding enterprises that were analyzed, the annual cost per enterprise was calculated as $ 42.467.94, 34.87% of which consists of varying costs and 65.13% of fixed costs (Table 7).

Table 8: Gross profit ($) and relevant rates (%).

Farm Size Group (Head)		Total GPV		Total Variable Cost		Gross Profit		Per Decares	Per LAU
		$	%	$	%	$	%	$/decar	$/LAU
Sheep Enterprise	1-800	137,338.73	100	60,179.42	43.82	77,159.31	56.18	157.58	1,577.36
	801-1250	225,077.78	100	78,709.75	34.97	146,368.03	65.03	367.16	1,783.60
	1251-+	306,688.08	100	113,614.41	37.05	193,073.67	62.95	226.38	1,652.72
	Ave. of the Enterprises	220,892.46	100	83,568.15	37.83	137,324.31	62.17	248.05	1,668.88
Goat Enterprise	1-250	27,841.87	100	8,245.59	29.62	19,596.28	70.38	6,858.70	1,305.05
	251-500	59,821.60	100	17,484.77	29.23	42,336.83	70.77	711.08	1,403.71

	501-+	123,215.51	100	22,968.81	18.64	100,246.70	81.36	2,082.28	1,908.84
	Ave. of the Enterprises	59,705.16	100	14,809.47	24.80	44,895.69	75.20	3,524.76	1,467.08

Gross profit is a criterion used in resolving the competitiveness of production operations in terms of the use of scarcely available means of production. That is to say, it shows the success of the enterprise (Riebe, 1968; Açıl, 1980; Oğuz&Bayramoğlu, 2005). In the studied enterprises, gross profit per enterprise was calculated as $ 137,324.31 in sheep and $ 44,895.69 in goat breeding enterprises. Agricultural income exhibits the degree of success of the entrepreneur in enterprises (Erkuş, 1979). The agricultural income value of the enterprises is given in Table 9.

Table 9: Agricultural Income ($)

Farm Size Group (Head)		Pure Revenue	Debt Interests and Rent Value	Equity Rent	Family Labor Cost	Agricultural Income
		$	$	$	$	$
Sheep Farming Enterprise	1-800	23,320.39	4,014.53	19,305.86	16,779.66	36,085.52
	801-1250	79,811.73	4,758.80	75,052.93	19,713.17	94,766.10
	1251-+	111,563.53	6,372.88	105,190.65	23,409.39	128,600.03
	Ave. of the Enterprises	70,359.09	5,022.88	65,336.21	19,887.71	85,223.93
Goat Farming Enterprise	1-250	4,398.42	2,450.36	1,948.06	832.93	2,780.99
	251-500	16,166.32	2,542.37	13,623.95	1,003.91	14,627.86
	501-+	57,860.06	3,334.14	54,525.92	968.52	55,494.44
	Ave. of the Enterprises	19,904.72	2,667.50	17,237.22	926.22	18,163.44

Agricultural income per farm in the enterprises was determined as $ 85,223.93 in sheep farming while it was $ 18,163.44 in goat farming enterprises.

Table 10: Milk production costs ($) and rates (%).

Farm Size Group (Head)		Total Variable Cost		Total Fixed Cost		Total Milk Production Cost
		$	%	$	%	$
Sheep Farming Enterprise	1-800	19,336.16	28.96	47,429.24	71.04	66,765.40
	801-1250	39,214.41	35.26	71,999.00	64.74	111,213.40
	1251-+	50,694.92	35.29	92,965.55	64.71	143,660.47
	Ave. of the Enterprises	31,188.70	33.04	63,208.54	66.96	94,397.24
Goat Farming Enterprise	1-250	8,117.29	29.46	19,433.23	70.54	27,550.52
	251-500	11,691.00	27.15	31,377.05	72.85	43,068.05
	501-+	18,289.10	28.13	46,732.16	71.87	65,021.26

	Ave. of the Enterprises	11,577.91	28.10	29,620.35	71.90	41,198.26

The average milk production cost in the research area was calculated as 94,397.24 $ in sheep farming. 33.04% of this value consists of varying costs, 66.96% of the costs are fixed. In goat farming enterprises, on the other hand, it was $ 41,198.26, and 28.10% of this value was varying costs and 71.90% fixed costs.

Table 11: Small ruminant breeding gross production value ($) and rates (%).

Farm Size Group (Head)		Milk Production Value		PSV		Wool, Hair		Skin		Farm Manure Value		Total	Per LAU
		$	%	$	%	$	%	$	%	$	%	$	$/LAU
Sheep Enterprise	1-800	13,789.27	24.68	40,993.79	73.37	224.97	0.40	17.46	0.03	850.43	1.52	55,875.91	799.92
	801-1250	43,697.03	36.31	74,641.24	62.02	722.54	0.60	16.19	0.01	1,270.85	1.06	120,347.86	1,106.39
	1251-+	82,627.12	36.91	135,567.80	60.56	2,025.42	0.90	554.41	0.25	3,074.76	1.37	223,849.50	1,503.61
	Ave. of Enter.	35,231.50	33.44	67,971.94	64.51	690.90	0.66	106.53	0.10	1,361.29	1.29	105,362.16	1,019.36
Goat Enterprise	1-250	6,821.77	24.63	20,430.99	73.78	9.27	0.03	7.30	0.03	423.58	1.53	27,692.91	1,844.26
	251-500	13,492.83	25.93	37,968.06	72.95	13.68	0.03	28.74	0.06	540.36	1.04	52,043.66	1,725.54
	501-+	25,641.65	22.76	84,527.85	75.03	47.40	0.04	19.56	0.02	2,424.38	2.15	112,660.84	2,145.22
	Ave. of Enter.	13,247.15	24.31	40,332.75	74.01	18.81	0.03	18.02	0.03	880.16	1.62	54,496.89	1,860.83

The average gross production value in the research area was calculated as 105,362.16 $ in sheep farming enterprises. 64.51% of this value was obtained from PSV (Productive Stock Value), 33.44% from milk production value, 1.29% from farm fertilizer value, 0.66% from wool value and 0.10% from skin sales. On the other hand, the average animal production value in goat breeding enterprises was calculated as $ 54,496.89. 74.01% of this value was obtained from PSV, 24.31% from milk production value, 1.62% from farm fertilizer value, 0.03% from hair value and 0.03% from skin sales.

Table 12: Distribution of the production costs according to products obtained ($) and rates (%)

Farm Size Group (Head)		Milk Production Cost		PSV		Wool, Hair		Skin		Farm Manure Value		Total	Per LAU
		$	%	$	%	$	%	$	%	$	%	$	$/LAU
Sheep Enterprise	1-800	16,476.61	24.68	48,982.94	73.37	268.82	0.40	20.86	0.03	4,386,703.43	1.52	66,765.40	955.82
	801-1250	40,380.41	36.31	68,975.94	62.02	667.70	0.60	14.96	0.01	1,174.39	1.06	111,213.40	1,022.42
	1251-+	53,027.82	36.91	87,003.69	60.56	1,299.86	0.90	355.80	0.25	1,973.29	1.37	143,660.47	964.97

	Ave. of Enter.	30,536.41	33.44	61,984.07	64.51	573.62	0.66	74.72	0.10	2,194,072.06	1.29	94,397.24	979.54
Goat Enterprise	1-250	6,786.69	24.63	20,325.94	73.78	9.23	0.03	7.26	0.03	421.40	1.53	27,550.52	1,834.78
	251-500	11,165.82	25.93	31,419.97	72.95	11.32	0.03	23.78	0.06	447.16	1.04	43,068.05	1,427.95
	501-+	14,798.86	22.76	48,784.54	75.03	27.35	0.04	11.29	0.02	1,399.21	2.15	65,021.26	1,238.10
	Ave. of Enterp.	10,110.63	24.31	30,426.90	74.01	13.76	0.03	14.41	0.03	632.56	1.62	41,198.26	1,556.38

In the research area, the milk production cost was calculated as an average of 94.937.24 $ per enterprise in sheep and an average of 41.198.26 per enterprise in goat breeding enterprises.

Table 13: Unit milk cost ($/kg).

Farm Size Groups (Head)		Milk Production Costs ($)	Amount of Milk Production (Kg)	Unit Milk Cost ($/Kg)	Milk Sale Price ($/kg)
Sheep Farming Enterprise	1-800	16,476.61	14,665.00	1.12	1.24
	801-1250	40,380.41	34,687.50	1.16	1.36
	1250-+	53,027.82	44,625.00	1.19	1.86
	Ave. of the Enterprises	30,536.41	26,332.50	**1.15**	**1.38**
Goat Farming Enterprise	1-250	6,786.69	4,859.14	1.40	1.32
	251-500	11,165.82	9,130.77	1.22	1.23
	501-+	14,798.86	17,357.14	0.85	1.55
	Ave. of the Enterprises	10,110.63	9,065.53	**1.22**	**1.33**

In the research area, the average unit milk cost was calculated as $ 1.15/kg in sheep farms and $ 1.22/kg in goats-farms. In a similar study, the cost of milk in sheep and goat farms was calculated as $ 0.4/kg and $ 0.5/kg, respectively, and in traditional sheep and goat farms, it was calculated as $ 0.5/kg and $ 0.63/kg (Hosri and Nehme, 2006). The average milk sales-price in sheep breeding enterprises is $ 1.38/kg and $ 1.33/kg in goat-breeding businesses.

Table 14: Small ruminant gross profit ($)

Farm Size Group (Head)		Small Ruminant GPV ($)	Small Ruminant Total Variable Cost ($)	Small Ruminant Gross Profit ($)
Sheep Enterprise	1-800	55,875.91	19,336.16	36,539.75
	801-1250	120,347.86	39,214.41	81,133.45
	1250-+	223,849.50	50,694.92	173,154.59

	Ave. of the Enterprises	105,362.16	31,188.70	74,173.46
Goat Enterprise	1-250	27,692.91	8,117.29	19,575.62
	251-500	52,043.66	11,691.00	40,352.65
	501-+	112,660.84	18,289.10	94,371.73
	Ave. of the Enterprises	54,496.89	11,577.91	42,918.98

On average, gross profit in sheep farming is 74,173.46 $ per enterprise while it is $ 42,918.98 in goat-farming enterprises.

5. Conclusions and Recommendations

In the research area, sheep and goat breeding is generally performed for fatling. PSV was, indeed, high in enterprises (85.07% in sheep farming and 74.01% in goat breeding enterprises). In addition, in sheep farming, there is no milking because the labour force is not available and it is rather expensive. The family workforce, however, is sufficient in enterprises, and the labour force is required only periodically during milking periods. Switching to the automatic milking method as the milking method in enterprises is critical for the evaluation of milk in enterprises. On the other hand, in goat-breeding businesses, animals are milked more for milk and cheese, etc. and marketed widely.

In the enterprises, both vegetable and animal breeding are carried out. Inclusion of both production activities will protect the business against possible risks. Ovine breeding is rather common in the research area. The reason for this is that pasturelands in the region are convenient for ovine breeding, and the enterprises that breed goats are located specifically in mountainous areas. Indeed, 40% of Konya agricultural lands constitute meadow and pasture lands; which supports this result. The largest share in the research field is the feed costs for enterprises that breed both sheep and goats (83.23%, 80.99%). Production of concentrate and roughage feeds inside the enterprise will make an outstanding contribution to the solution of the feeding problem in the livestock activities of the enterprises. Moreover, in the research field, especially in sheep breeding enterprises, there are problems in terms of labour force, insufficient feeding in meadow pasture areas, and low roughage production in animal nutrition and ration preparation. The significance of sufficient and balanced nutrition, the use of concentrate feed and the benefits of supplementary feeding, especially during vaccination, pregnancy and lactation, should be taught to farmers through training. The adoption of these practices by farmers is quite crucial for the profitability and sustainability of enterprises.

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