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AN ECONOMIC EVALUATION OF MOHAIR PRODUCTION IN ANKARA PROVINCE

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Abstract: Angora goat is the most important goat breed that spread from Central Asia to Anatolia and became a part of Turkish culture. Angora goat, which is thought to have been brought to Anatolia in the 13th century, is intensively raised in the Central Anatolian region, especially in Ankara and its surroundings. In this study, it is aimed to give information about the distribution of the goat population according to Ankara province and its districts, the amount and price of mohair purchase by years, and the fiber quality of Angora goats raised in the region. According to the findings, it has been observed that there is an increase in the number of Angora goats in Ankara parallel with the total number of small ruminants in Türkiye. When the farms that are members of the Ankara Sheep and Goat Breeders' Association are examined, Ankara goat breeding is carried out in almost all districts of Ankara. The number of Ankara Goats, which was approximately 158 thousand in 2012, reached approximately 289 thousand in 2021. Between 2016 and 2021, a total of 48814.00 kg of mohair was obtained from Ankara Goats in Ankara. Furthermore, when mohair prices are analyzed in dollars, it is determined that the highest price was in 2019, and the amount of subsidy given by the State decreased over the years. In terms of literature, we can say that there are not enough new studies on Angora goats and that up-to-date studies are needed. The fact that Ankara is suitable for goat breeding due to its geography and that the importance of goat breeding for those living in rural areas in cultural terms has ensured the continuity of Ankara Goat production. Although the goat population seems to be increasing in the last 10 years, there has been a serious decrease compared to the beginning of the 1900s. Necessary studies should be done properly in order to increase the Angora goat population.

Keywords: Ankara, Mohair, Angora goat, Price, Quality

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1. Introduction

Angora goat is the most important goat breed that spread from Central Asia to Anatolia and became a part of Turkish culture. Angora goat, which is thought to have been brought to Anatolia in the 13th century, is intensively raised in the Central Anatolian region, especially in Ankara and its surroundings (Yanar and Akpınarlı, 2016).

Ankara, which is an important commercial transit point due to its geography, had an important place in the export income obtained from Angora goats, especially in the Ottoman period (Sen et al., 2015). However, in the last 50 years, the increase in migration from rural areas to the city, low quality mohair production and decrease in mohair income have caused a decrease in the interest in Angora goat breeding. Especially in recent years, crossing with Hair Goat, which has been done intensively and unconsciously, has adversely affected the production and quality of Mohair (Behrem, 2011; Daskıran and Koluman, 2015).

Since both the number of goats and the number of other domestic breeds are not competitive compared to the world-wide breeds in terms of production, their numbers are decreasing day by day. Although studies have been carried out to identify the genetic potential of domestic animal genetic resources in terms of economically important traits, these studies are not yet sufficient in Türkiye (Gül et al., 2020; Behrem, 2021; Kizilaslan et al., 2022; Arzik et al., 2022; Yilmaz et al., 2022). There are similar situations in Angora goats, and unfortunately their number has experienced a serious decline for a period. The number of goats in our country has a share of approximately 20% in the sheep and goat population and has reached approximately 12 million with an increase of 47.67% in the last 10 years. The number of Angora goats has doubled in the last 10 years and is approximately 289000 (TUIK, 2020).

The National Small Ruminant Breeding Programme, carried out by the Ministry of Agriculture and Forestry and the Ankara Sheep and Goat Breeders' Association, had started breeding studies and financial support for fleece production played an important role in this increase since 2005. In this study, it is aimed to give information about the number of Angora goats in Ankara and its surrounding, the amount and price of mohair, and the fiber quality of Angora goats raised in Ankara.

2. Materials and Methods

Angora Goat is raised in 18 districts of Ankara namely Mamak, Sincan, Yenimahalle, Akyurt, Beypazarı, Çamlıdere, Çubuk, Etimesgut, Evren, Kazan, Gölbaşı, Ayaş, Güdül, Haymana, Kızılcahamam, Nallıhan, Polatlı and Şereflikoçhisar. It is the second largest city of Türkiye due to being the capital city and the immigration recieved from nearby cities. The coordinates of Ankara are 39.57 N latitude and 32.53 E longitude. It has an area of 26,897 km² and its altitude is approximately 890 meters (m).

Ankara has a demonstrates characteristics of semi-arid climate and has a large territory, so different climate characteristics can be seen. The steppe flora can be seen in the northern part of the city due to the climate effect of the Black Sea. But usually, it has cold winters and dry summers. The annual temperature ranges from -25˚C to 40˚ C. Precipitation is between 300 mm and 540 mm and humidity is between 40-79% (Anonymous, 2020).

In the study, based on the data of the 812 herds registered to Ankara Sheep and Goat Breeders' Association, the number of Angora goats, the status of local breeding practices, amount of received mohair, price of mohair and its quality were evaluated. The dollar-based annual subsidy amount in the tables has been calculated according to the Central Bank's annual dollar exchange rate in June.

3. Results and Discussion

3.1. The number of Small Ruminants in Türkiye

When the numbers of sheep and goats in Türkiye are examined in Table 1, it is observed that the number of domestic sheep, Merino crossese, Hair goat, Angora goat and the total number of small ruminants increased by 78%, 59%, 160%, 46% and 83%, respectively.

3.2. Ankara Sheep and Goat Breeders' Association and the Number of Members

The districts with the highest number of breeders registered in Angora goats breeding in Ankara are Beypazarı (203), Güdül (124) and Ayaş (120), respectively. There are no registered breeders in Etimesgut, Evren and Yenimahalle districts. The total number of herds registered to the Ankara Sheep and Goat Breeders' Association is 812 (Figure 1).

When we examine the districts in terms of the number of Ankara goats, Güdül, Beypazarı and Ayaş districts are appear to be top three places with 40615, 28359 and 26745 heads of animals, respectively. As seen in Figure 2, Ankara Angora goat is raised in almost all districts.

Table 1. Sheep and goat numbers (heads) by year in Türkiye (TUIK, 2020)

Year	Domestic Sheep	Merino Crossbreed Sheep	Hair Goats	Angora Goats	Total
2012	25 892 582	1 532 651	8 199 184	158 102	35 782 519
2013	27 485 166	1 799 081	9 059 259	166 289	38 509 795
2014	29 033 981	2 106 263	10 167 125	177 811	41 485 180
2015	29 302 358	2 205 576	10 210 338	205 828	41 924 100
2016	28 832 669	2 151 264	10 137 534	207 765	41 329 232
2017	31 257 408	2 420 228	10 419 027	215 645	44 312 308
2018	32 513 293	2 681 679	10 698 553	223 874	46 117 399
2019	34 199 467	3 076 583	10 964 374	241 055	48 481 479
2020	38 579 748	3 547 033	11 698 825	287 020	54 112 626
2021	41 182 899	3 994 791	12 051 957	289 557	57 519 204

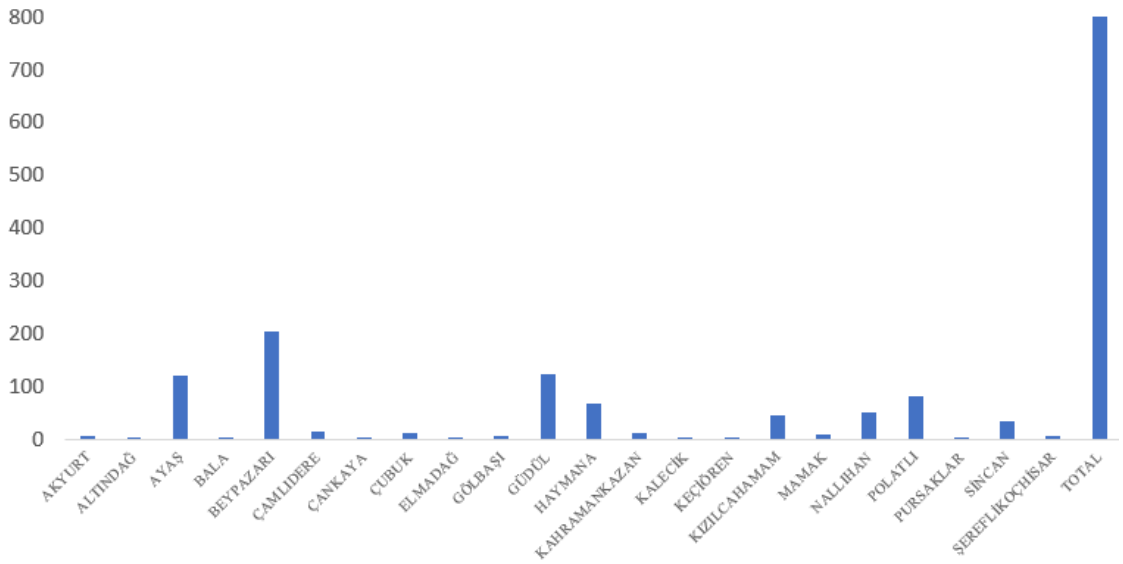

Figure 1. The number of members registered in Ankara Sheep and Goat Breeders' Association by regarding districts of Ankara in 2021.

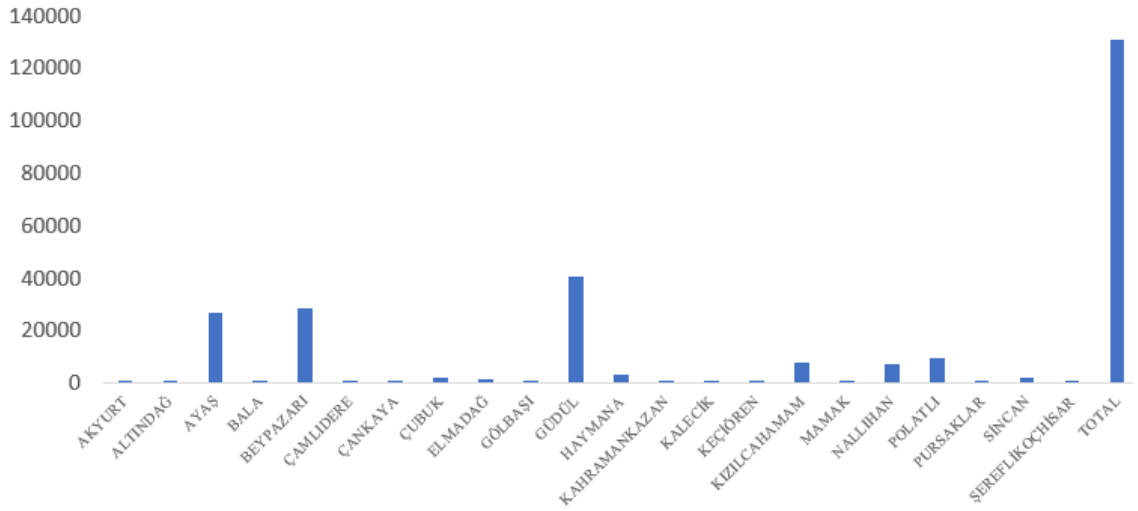

Figure 2. The number of district-based Angora goats belonging to herds registered to Ankara Sheep and Goat Breeders Association in 2021.

Until 2015, Mohair and Wool Agricultural Sales Cooperatives Union (MWASCU) was the only organization in our country for purchasing mohair. However, after 2015, Ankara Sheep and Goat Breeders Association (ASGBA) started to purchase mohair as of 2016, with authorization given by the Ministry of Agriculture and Forestry. In our country, mohair subsidy is given if mohair is sold to the institutions authorized by the Ministry of Agriculture and Forestry. In addition, according to Article 4 of the Presidential Decree dated 5.11.2020, wool processing factories registered with the Ministry are allowed to collect mohair with a receipt. Starting in 2020, farmers selling mohair to these factories are also included in additional subsidy.

It is seen that there has been an increase in mohair prices since 2016, with ASGBA starting to purchase mohair and also depending on the world markets. Table 2 shows that prices were the lowest in 2018 and the highest in 2019. Moreover, Table 2 shows that yearling kids' mohair is a more preferred product due to its smaller micron diameter and accordingly, its price is higher than that of 2 years old goat mohair. Unclassified mohair, on the other hand, is defined as dirty mohair with faces remaining on the underbelly and rear parts and finds buyers at a very low price.

The amount of mohair collected by the Ankara Sheep and Goat Breeders Association (ASGBA) is presented in Table 3. According to this table, it is seen that the highest amount of mohair was collected in 2020. For the sake of mohair classification, OFDA 2000 optical measurement instrument is used to sort those samples by determining the fibre diameter (micron) and get those ready for sale.

Table 2. Kids, adults and un-classified dirty mohair prices of Ankara Sheep and Goat Breeders Association (ASGBA) and Mohair and Wool Agricultural Sales Cooperatives Union (MWASCU) by years (Anonymous, 2021)

	Kids kg/$		Adults kg/$		Unclassified Mohair kg/$	
Years	ASGBA	MWASCU	ASGBA	MWASCU	ASGBA	MWASCU
2015	None	3.73	None	2.98	None	0.74
2016	5.08	4.07	4.41	3.39	1.02	1.02
2017	5.10	4.25	4.25	3.68	0.85	0.85
2018	4.36	3.70	3.70	3.27	0.65	0.65
2019	8.91	6.00	7.54	5.14	0.86	0.86
2020	6.61	6.61	5.88	5.58	0.73	0.88
2021	5.88	5.88	5.29	5.29	0.59	0.71

Table 3. The amount of mohair collected by Ankara Sheep and Goat Breeders Association (ASGBA) by years (Anonymous, 2021)

Year	Kids (kg)	Adults (kg)	Unclassified Mohair (kg)	Total (kg)
2016	4.483.86	12.333.70	430.20	17.247.76
2017	7.734.10	17.451.30	364.40	25.549.80
2018	14.328.80	29.478.00	946.4	44.753.20
2019	17.354.90	29.475.40	529.8	47.360.10
2020	13.440.50	56.006.00	1.845.50	71.292.00
2021	11.709.00	36.542.00	563.00	48.814.00

The amount of subsidy given by the Republic of Türkiye Ministry of Agriculture and Forestry has decreased in dollar terms over the years. The subsidy model is as follows: Ankara Sheep and Goat Breeders Association (ASGBA) or Mohair and Wool Agricultural Sales Cooperatives Union (MWASCU) collects and invoices mohair from breeders. Farmers receive subsidies over the amount they produce according to these invoices.

According to previous studies, the average weight of dirty mohair for kids and adults are 1.42 kg and 3.62 kg, respectively. As can be seen in Table 4 and 5, according to previous studies, the average weight of dirty mohair is 1.42 kg and 3.62 kg, respectively, according to different age groups in kids and matriarch goats. Again, for the kids and adult groups, the mean fibre diameter was 25.36 µ and 39.81 µ, the mean elasticity was 27.35% and the mean strength was 45.26%, 10.16 g and 23.74 g, the mean medulla fibre ratio was 0.29%, 6.89%, the mean length was 62.9 mm and 176.3 mm, respectively (Öztürk and Goncagül, 1994; Öztürk and Örkiz, 1994; Vatansever and Akçapınar, 2006; Bilgen et al., 2008; Şen, 2015; Erol et al., 2017). It is seen that the dirty mohair weight is the lowest in kids and the dirty mohair yield increases as the age increases. When we examine the studies, thinness increases as age increases.

Table 4. The amount of subsidy provided by the Republic of Türkiye Ministry of Agriculture and Forestry for kids, adults and unclassified mohair (Anonymous, 2021)

Year	Kids kg/$	Adults kg/$	Unclassified mohair kg/$
2016	7.46	7.46	7.46
2017	7.65	7.65	7.65
2018	6.53	6.53	6.53
2019	5.14	4.80	3.43
2020	4.41	4.11	2.94
2021	4.11	3.52	2.58

Table 5. Previous studies on Mohair characteristics

Year	Sex	Dirty Mohair (kg)	Diameter (µ)	Elasticity (%)	Strength (g)	Medulla fibre ratio (%)	Length (mm)	Reference
Kid	M F	-	25.36 26.55	43.25 45.26	12.27 14.31	6.89 5.82		Şen (2015)
1-3 year	M	1.62, 2.98, 3.13	30.03, 32.34, 34.72	29.25, 27.50, 27.35	14.12, 23.45, 23.74	0.39, 0.65, 2.58		Öztürk and Goncagül (1994)
1-3 year	F	1.42, 2.55, 2.69	30.10, 31.34, 34.21	30.56, 31.34, 34.21	14.38, 23.63,22.68	0.29, 0.48, 0.28		
>2 year	F	3.67, 3.41	38.41, 39.81	29.68, 29.98	20.82,21.78	0.50, 0.53	176.3, 175.5	Öztürk and Örkiz (1994)
1-6 year	F	2,67	34.64	38.92	10.16	-	62.9	Bilgen et al. (2008)
2-6 year	F	3.11	37.98	37.78	10.89	1.50	64.9	Vatansever and Akçapınar (2006)
1-5 year	F	2.26, 2.18, 1.81	37.15	40.15	20.24	-	73.5, 111.2	Erol et al. (2017)

4. Conclusion

The fact that Ankara is suitable for goat breeding due to its geographical structure and the cultural importance of goat breeding for those living in rural areas has been underlying the uninterrupted Angora goat production. Although the goat population seems to be increasing in the last 10 years, there has been a serious decrease compared to the beginning of the 1900s. It is essential that the necessary studies be done consciously in order to increase the current number. It is thought that the price of mohair and subsidy, which has decreased in dollar over the years, will weaken the production. For this reason, the Ministry of Agriculture and Forestry, the Associations and the Cooperatives should determine the improvement and subsidy policy of the next 10 years and carry out studies that will make Angora goats more attractive for breeding.

Author Contributions

The percentage of the author(s) contributions is present below. All authors reviewed and approved final version of the manuscript.

	Y.A.	S.B.	M.K.
C	30	40	30
D	30	40	30
S	30	40	30
DCP	30	40	30
DAI	30	40	30
L	30	40	30
W	40	30	30
CR	30	40	30
SR	30	40	30
PM	30	40	30
FA	30	40	30

C=Concept, D= design, S= supervision, DCP= data collection and/or processing, DAI= data analysis and/or interpretation, L= literature search, W= writing, CR= critical review, SR= submission and revision, PM= project management, FA= funding acquisition.

Conflict of Interest

The authors declared that there is no conflict of interest.

Ethical Consideration

Ethics committee approval was not required for this study because of there was no study on animals or humans. The data taken from Ankara Sheep and Goat Breeders' Association.

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