

Structural Characteristics of Sheep and Goat Husbandry in Çorum Province

Çorum İli Küçükbaş Hayvan Yetiştiriciliğinin Yapısal Özellikleri

Hacer TÜFEKÇİ¹ 

Başak ÖZTEN² 

¹: Yozgat Bozok University, Faculty of Agriculture, Department of Animal Science, Yozgat, Türkiye

²: Yozgat Bozok University, Institute of Graduate Education, Yozgat, Türkiye

ABSTRACT

The aim of the study is to determine the structural characteristics of sheep and goat farm in Çorum province, the problems faced by breeders and to offer solutions to these problems. The material for the study consisted of data obtained through personal interviews in 140 sheep and goat farms in the districts of Çorum province. In the study, it was determined that the breeders were mostly between 41-50 years old, their education level was secondary school (55.7%), the number of family members was 3-4 and their experience in the profession was 21-30 years. In the study, it was determined that females were used for breeding for 4-5 years and males for 3 years. It was determined that animal records were generally not kept on the farm and the need for shepherds in the family was met from the family (64.3%). In conclusion in addition to the problems of marketing and insufficient pastures, breeders also lack knowledge about cultivation and health protection and the potential in the region is not adequately reflected in production. In order to overcome these problems, it is necessary to increase and continue the support for the development of sheep and goat husbandry, improve health protection and social rights and encourage young people in particular.

Keywords: Çorum, Sheep, Goat, Structural characteristics, Husbandry

Öz

Bu çalışmanın amacı, Çorum ilinde küçükbaş hayvan yetiştiriciliği yapan işletmelerin mevcut yapısal durumlarını, sorunlarını belirleyerek geliştirme olanakları ve çözüm önerileri sunmaktır. Çalışmanın materyalini, Çorum iline bağlı ilçelerde bulunan 140 küçükbaş hayvancılık işletmesinde yapılan anketlerden elde edilen veriler oluşturmuştur. Çalışmada yetiştiricilerin çoğunlukla 41-50 yaş arlığında, eğitim durumlarının ortaokul, aile birey sayısı 3-4 ve bu işteki deneyimlerinin 21-30 yıl olduğu belirlenmiştir. Yapılan çalışmada damızlık olarak dişi hayvanların 4-5 yıl erkek hayvanların ise 3 yıl kullanım süresi olduğu belirlenmiştir Genel olarak işletmede hayvan kayıtlarını tutulmadığı, çoban ihtiyacının ise aile içinden (%64,3) sağlandığı belirlenmiştir. Sonuç olarak çalışmanın yapıldığı işletmelerde karşılaşılan sorunların başında yem ve işçilik giderlerinin fazla olması gelirken sırası ile en çok karşılaşılan problemler ürünlerin değeri fiyatına satılamaması, mera sorunu, sağlık sorunları ve çoban bulma sorunu olarak belirlenmiştir. Ayrıca yetiştirme ve sağlık koruma konularında bilgi eksiklikleri söz konusu olup bölgede var olan potansiyel üretime yeteri kadar yansıtılmamaktadır. Bu sorunların giderilmesi ile küçükbaş hayvan yetiştiriciliğini geliştirmeye yönelik desteklerin artırılarak devam ettirilmesi, sağlık sigortası ve sosyal hakların artırılması ile özellikle gençlerin teşvik edilmesi gerekmektedir.

Anahtar Kelimeler: Çorum, Koyun, Keçi, Yapısal özellik, Yetiştiricilik

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Corresponding author / Sorumlu Yazar:

Hacer TÜFEKÇİ

E-mail: hacer.tufekci@bozok.edu.tr

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Introduction

Animal husbandry has significant potential in the national economy. This branch of production is important for the adequate and balanced nutrition of people, the satisfaction of their physiological needs and the acquisition of the capital required for economic development (Yıldız & Akgün, 2021). Within livestock production, small ruminant husbandry plays an important socio-economic and environmental role worldwide (Simões et al., 2021). Sheep and goat farming is often characterized by low productivity per animal and per area, using mainly marginal land that is not suitable for crop cultivation. This branch of production has a positive impact on local socio-economic activities, plays an important role in the maintenance of rural communities and produces unique, valuable foods such as red meat or cheese (de Rancourt et al., 2006; Bertolozzi-Caredio et al., 2021; Teixeira et al., 2020). However, these systems are under considerable pressure as they are characterised by low labour availability, traditionally low productivity and often poor economic profitability (Bertolozzi-Caredio et al., 2021; Wishart, 2019).

Our country's climate, land suitability, natural conditions such as soil structure and vegetation, economic and agricultural structure and traditions are very suitable for widespread small ruminant husbandry and it has an important place in animal husbandry (Karaca et al., 2003). Çorum province, which is located in the interior of the Central Black Sea region, is at the transition to the Central Anatolian climate and ranks twentieth in Turkey with its current area (12,820 km²). When the land use in Çorum province is analyzed, 43% of the total area is agricultural land, 35% is forest and heath and 17% is other parts (Anonymous, 2023). This situation shows that Çorum province has a natural potential for agriculture and livestock farming. When Table 1 and Figure 1 are analysed, according to the latest data, there are 201,858 sheep and 62,955 goats in Çorum province and a total of 264,813 small ruminant (TUIK, 2024). The aim of this study was to determine the socio-demographic status of sheep and goat

husbandry in Çorum province, the general characteristics of the farms, flock management practices, housing characteristics, health protection practices and the general problems of the farms. In this way, a contribution should be made to solve the problems by determining the current situation of breeders for the sustainability of sheep and goat husbandry in Çorum province.

Methods

Material

Permission to conduct the study was obtained with the decision of the Yozgat Bozok University Social and Human Sciences Ethics Committee dated 28/06/2024 and numbered 15/02. The material of the study consisted of the data obtained from face-to-face questionnaires in 140 sheep and goat farms located in the districts of Çorum province. Questionnaire questions were prepared to determine the socio-demographic status of the breeders and general characteristics of the farms, herd management practices, shelter characteristics, health protection practices, general problems of the farms and expectations of the breeders.

Table 1.

Number of small ruminants in Çorum province by districts

Districts	Sheep	Goat	Total
Alaca	16,087	686	16,773
Bayat	10,263	1,848	12,111
Boğazkale	813	462	1,275
Dodurga	1,904	1,356	3,260
İskilip	6,057	6,183	12,240
Kargı	11,096	5,959	17,055
Laçın	6,286	3,486	9,772
Mecitözü	11,625	4,281	15,906
Merkez	50,593	13,387	63,980
Oğuzlar	297	269	566
Ortaköy	3,065	2,456	5,521
Osmancık	26,451	9,337	35,788
Sungurlu	50,328	9,444	59,772
Uğurludağ	6,993	3,801	10,794
Total	201,858	62,955	264,813

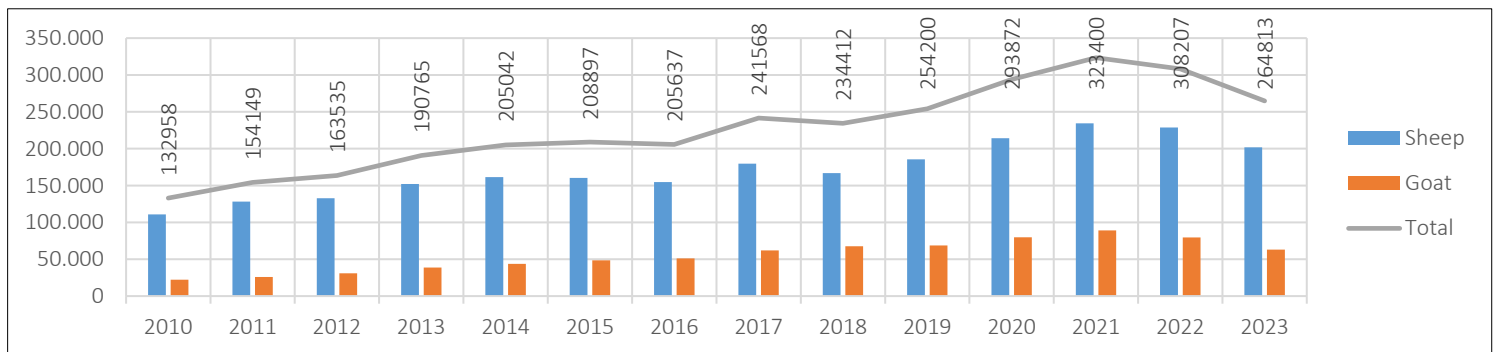


Figure 1.
Number of small ruminants in Çorum province between 2010-2023

Method

A stratified random sampling method was used to determine the number of farms in the study (Yamane, 2001). The IBM SPSS v24 programme was used to analyse the research data (SPSS, 2016). With a confidence interval of 95% and a margin of error of 0.05, the sample size was calculated to 140 using the following formula. In the formula; n: number of samples, N: number of enterprises in the population, Nh: number of enterprises in the h-th stratum, Sh: variance of the h-th stratum, d: Permissible margin of error from the mean value of the population, z: value in the diagram of the standard normal distribution corresponding to the margin of error.

$$n = \frac{(\sum Nh \times Sh)^2}{N^2 \times D^2 + \sum(Nh \times Sh^2)} \quad D^2 = d^2/z^2$$

Results and Discussion

Socio-demographic status of breeders and general characteristics of farms

Sheep and goat husbandry is one of the most important sources of income influencing the economic prosperity of rural communities. The socio-demographic characteristics of the breeders are one of the factors that directly influence production as in other areas. It was found that the breeders who participated in the survey were mostly between 41-50 years old (47.9%), their educational status was at the secondary level (55.7%), the number of family members was 3-4 (50%) and their experience in this business was 21-30 years (37.1%) (Table 2). The producer age values determined in this study are similar to the average age of producers in different regions (Aydın & Keskin, 2018; Bakır & Mikail, 2019; Demir & Tuncer, 2022; Tüfekci & Olfaz, 2015). In their study, Demir and Tuncer (2022) reported that the owners of small ruminant breeding farms are mostly middle-aged and some management experience is required. The results on the professional experience of breeders are similar to the values reported by Demir and Tuncer (2022) and Şahin (2019). The results on education level were higher than the results of Şahin (2019) in Tokat province, Acıbuca and Budak (2021) in Mardin province, Aydın and Keskin (2018) in Muğla province. Güner and Ulutaş (2021) reported in their study that the probability of breeders continuing sheep breeding increased 1.51 times with increasing education level. Similarly, Aktürk et al. (2005) reported that higher average education level is one of the factors that increase organisation and that education level is a factor that increases the use of formal news sources. Alassaf et al (2011) reported that increasing the level of education of farmers has a positive effect on the continuation of their agricultural activities by increasing productivity and profitability through better management of their farms. The

results of education level, which are in line with the existing literature reports, could provide an advantage in improving sheep and goat husbandry in the province.

Table 2.
Sociodemographic characteristics of the breeders

	n	%		n	%
Age			Education status		
31-40	17	12.1	Primary school graduate	36	25.7
41-50	68	48.6	Secondary school graduate	78	55.7
51-60	45	32.2	High school graduate	22	15.7
61 and above	10	7.1	University graduate	4	2.9
Professional experience			Number of households		
5-10	8	5.7	1-2	44	31.4
11-20	31	22.1	3-4	70	50.0
21-30	52	37.1	5-7	26	18.6
31-40	42	30.0	Reason for livestock production		
40 and above	7	5.0	Contribution to income	11	7.9
			Contribution to income-habit-sole source of income	129	92.1

The general characteristics of the farms are listed in Table 3. Regarding the size of the herd, 26.4% of the breeders had 51-100 animals, 24.3% 101-150 animals, 22.1% 151-200 animals, 13.6% 0-50 animals, 10% 201-300 animals and 3.6% 301-400 animals. In addition to meeting their own needs, it was found that the breeders were mainly engaged in slaughtering, sacrifice and breeding production, that they did not receive any support in starting the enterprise, that their parents were the sources of information in breeding, that the need for shepherd in the enterprise was met from within the family (64.3%) and that the breeders also wanted to continue their activities in animal husbandry.

The fact that subsistence, i.e. the needs of the family, is the most important factor among the reasons for keeping sheep and goats husbandry, and that it constitutes a large part of the family's source of income, is an indication that farming is practiced over many years. On the farms where the survey was carried out, it is very important for sheep breeding that the breeders continue this business as their father's occupation and have been breeding for many years. The farms are mostly dominated by a traditional production system and breeding is carried out at a low profit. Various seminars and courses on sheep and goat breeding should be disseminated so that they reach producers everywhere in rural areas. The breeders should be informed by the relevant institutions about the breeding practices that are suitable for today's conditions and that they need to know in order to improve the profit rates of the farms.

Table 3.*General characteristics of the farms*

	n	%		n	%
Herd size			Purpose of production		
0-50	19	13.6	Own need	30	21.4
51-100	37	26.4	Butchery	20	14.3
101-150	34	24.3	Additional income	11	7.9
151-200	31	22.1	Own need-butchery-sacrifice-breeding	79	56.4
201-300	14	10.0	Establishment of a enterprises		
301-400	5	3.6	Own means	98	70.0
Land ownership status			Use of credit	42	30.0
Own land	10	7.1	The way of obtaining information on animal husbandry		
Own-government land	120	85.7	Family	49	35.0
Membership to producer organisation			Family-internet-TV-district directorates	77	55.0
Member	125	89.3	Family-internet-TV-	14	10.0
No membership	15	10.7	Shepherd situation		
Continuing livestock activities			Family workforce	90	64.3
I will continue	120	85.7	Shepherd-seasonal	16	11.4
I will not continue	20	14.3	Shepherd-permanent	34	24.3

Herd Management Practices in Farms

In the sheep and goat husbandry farms where the study was conducted, mostly female (85%) and male (89.3%) breeding animals are obtained from their own herd (Table 4). These results were similar to the results of Aydın and Keskin (2018), Bilginturan (2008), Köseman et al. (2022), Tüney Bebek and Keskin (2018), Tüfekci (2020). In the study, it was determined that female animals were mostly used for 4-5 years and male animals were used for 3 years. The findings obtained are similar to those reported in the literature (Aritunca & Karabacak, 2020; Ceyhan et al., 2015; Karakuş & Akkol, 2013; Tüfekci, 2020). In addition, it was determined that mostly (70%) no records were kept in the farms. In all farms, keeping records is very important in order to increase productivity, to obtain high income and thus to increase profitability. The records to be kept contribute to the determination of the current situation in the enterprises and then to the correct planning of the future of the enterprises (Erkan & Aşkın 2001; Köseman et al., 2022). Therefore, the importance of record keeping should be adopted in enterprises. In the study, the age at which the animals were first used in breeding was determined as 12 months. Aydın and Keskin (2018) reported that the age of first breeding was generally 8-12 months in sheep and goat breeding. All of the farms participating in the survey have Akkaraman and Kangal Akkaraman sheep breeds and Kıl goat breeds. In

addition, all of the breeders stated that they give mother's milk to the lambs and kids born and the average weaning age is 4-6 months, milking is not done in the enterprises, male and female lambs are not separated from each other, and practices such as castration, tail cutting or horn blunting are not performed in lambs and kids.

Table 4.*Herd management in the farms*

	n	%		n	%
Breeding (female)			Breeding (male)		
Own flock	119	85.0	Own flock	125	89.3
Livestock market - other enterprises	21	15.0	Livestock market - other enterprises	15	10.7
Breeding period female (year)			Breeding period female (year)		
2			2	40	28.6
2-3	63	45.0	3	77	55.0
4-5	77	55.0	4	23	16.4
Age at first breeding female (month)			Age at first breeding male (month)		
12	117	83.6	12	80	57.1
15	20	14.3	15	47	33.6
18	3	2.1	18	13	9.3
Record keeping in the enterprise			Most important income		
Yes	42	30.0	Meat production-sacrifice	50	35.7
No	98	70.0	Breeding-meat production-sacrifice	90	64.3
Shearing			In the last 5 years, has the number of animals increased?		
Yes-machine	120	85.7	Yes	91	65.0
Yes-scissors	20	14.3	No	49	35.0
Evaluation of wool			Status of manure evaluation		
In return for the shearing fee	70	50.0	Plant production	88	62.9
By selling	37	26.4	Plant production - fuel	40	28.6
Evaluation within the enterprise	33	23.6	By selling	12	8.6

Barn Characteristics and Health Protection Practices in Farms

In sheep and goat husbandry, barn conditions affect the life and productivity of the animals and the survival power of the offspring. Climate and geographical conditions affect shelter structures and require planning according to these factors. Planning of sheep and goat barns for regional climatic conditions and environmental factors and taking precautions are effective in reducing animal losses. In general, open barns, semi-open barns and closed barns are

used in sheep and goat husbandry. Seventy per cent of the enterprises where the survey was conducted consist of semi-open barns. It was determined that the floor material of the enterprises was mainly soil, wall material was stone, roof material was tile, feeder material was wood and drinker material was galvanised sheet. It was also determined that 65.7% of the farms had lamb barns, 42.9% had birth barns and 24.3% had sick animal barns (Table 5).

Table 5.
Barn characteristics of the farms

	n	%		n	%
Type of barn			Barn wall material		
Indoor barn	42	30.0	Adobe	32	22.9
Semi-open barn	98	70.0	Concrete	14	10.0
Floor type			Stone	57	40.7
Soil	112	80.0	Brick, briquette	37	26.4
Concrete	28	20.0	Feeder material		
Roof material			Wooden material	72	51.4
Roof tile	66	47.1	Sheet metal	68	48.6
Sheet metal	32	22.9	Drinking material		
Wooden material	42	30.0	Plastic	54	38.6
Lamb compartment			Sheet metal	68	48.6
There is	92	65.7	Automatic	8	5.7
None	48	34.3	Stone-concrete	10	7.1
Sick animal compartment			Birth compartment		
There is	34	24.3	There is	60	42.9
None	106	75.7	None	80	57.1

In a study conducted by Yılmaz (2008) in Bolu region, it was reported that the barns should be planned by dividing the animals into special compartments according to sex and age, and the barns without special compartments should be divided into suitable compartments, and if there is no space for division, an additional building should be built. In addition, it was reported that groups of animals were together in the small ruminant barns where the study was conducted and this situation caused difficulties in terms of animal health and labour force. Similar to the results of the study, Amak (2018) reported that 95.1% of small ruminant enterprises did not have a sick animal compartment in their study conducted in Şanlıurfa region. In their study, Büyüktaş et al. (2016) stated that in order to prevent animal diseases, compartments should be built in the resting area in accordance with the dimensions of the sick animals.

While 71.4% of the breeders who participated in the survey reported that they carried out regular health checks in their farms, 89.3% stated that they did not keep health records in their farms (Table 6). When there was a health problem in the herd, 50% of the breeders reported that they applied to the veterinarian and 50% to the Provincial-District

Directorate of Agriculture and Forestry and the veterinarian. 90.7% of the breeders stated that they sometimes quarantine the purchased animals. In addition, the breeders reported that vaccination practices were mostly carried out by the veterinarian and themselves according to the programme. The findings of vaccination practices obtained in the study are similar to those reported in the literature (Yılmaz, 2016; Acar & Ayhan, 2012; Ceyhan et al., 2015, Tüfekci, 2020).

Table 6.
Health protection characteristics in enterprises

	n	%		n	%
Regularly health check			Keeping regular health records		
Himself	100	71.4	Yes	15	10.7
Veterinary	40	28.6	No	125	89.3
The person to be called for health problems in the herd			Quarantine application of purchased livestock		
Veterinarian	70	50.0	Yes	127	90.7
Provincial directorates- veterinarians	70	50.0	No	13	9.3
Testing following a livestock purchase			Compliance with the vaccination schedule		
Yes	26	18.6	Yes	128	91.4
No	114	81.4	No	12	8.6
Bath application status			Vaccination person		
No	117	83.6	Breeder- shepherd	43	30.7
Yes	23	16.4	Breeder- veterinarian	97	69.3
Manure conservation status in the barn			Foot bath use		
Yes, once a year	60	42.9	Yes	12	8.6
No	80	57.1	No	128	91.4

In order to be able to make evaluations as a whole in the enterprises and to provide economic benefits to the enterprise, it is necessary to provide the necessary training and information to the breeders in order to understand and encourage the importance of keeping records of health protection and personnel-vehicle-animal movements that provide entry-exit to the enterprise, and to make it a routine practice rather than an obligation. Again, quarantine, which is an important practice and protective measure in the supply of animals to the farm, keeping animals in an observation unit or a separate section is an effective and practical practice. Breeders should be made more aware of the necessity of quarantine in farms. Gökmener (2023) stated in his study that health protection practices are very important in breeding and health protection starts with disinfection. In addition, it was reported that the absence of harmful microorganisms in a healthy barn will protect the animals from diseases, so disinfection should be applied to

the shelters in certain periods. All of the breeders stated that they carry out internal and external parasite control in the spring with medicine, injection and lime applications. However, 83.6% of the breeders reported that they did not give body baths to their animals. External parasites may directly or indirectly cause decreased growth performance, reproductive defects, decreased yields and increased mortality rates in small ruminant farms. In addition to increasing productivity in small ruminants, effective external parasite control is an important issue in terms of animal welfare (Akgül et al., 2019). Body cleansing and care can be provided in a good way by bathing in sheep and goats, and this practice is also mandatory for animal health, especially for protection against external parasites, as it also provides an effective medication opportunity (Kaymakçı, 2002).

Feeding and Feed Supply Status on Farms

Sheep and goat husbandry is mostly based on pasture and in most of our regions, a significant part of the feed requirements of animals are met from natural grazing areas such as meadows, pastures and plateaus. All of the breeders stated that their animals benefit from pasture for 8-9 months and stay in the corral for 3-4 months, they give wheat, barley straw, beet pulp, alfalfa and vetch as roughage sources, and factory feed and barley crushed as concentrate feed sources. All of the breeders reported that the condition of the animals was at the forefront in the feeding of the animals and at least one fattening application was made to the animals in different periods. 92.9% of the breeders stated that they gave supplementary feeding to their animals (Table 7).

Table 7.
Animal feeding and feed supply in enterprises

	n	%		n	%
What are the most important criteria in animal nutrition?			Status of fattening practices on the enterprises		
Condition	46	32.9	Yes-lamb/goat	47	33.6
Condition-pasture	29	20.7	Yes-lamb/goat - sacrifice	32	22.9
Condition-economic reasons	19	13.6	All	61	43.6
All	46	32.9	Supplementary feeding situation		
Feeding puppies during the suckling period			Yes-mating-birth	130	92.9
			No	10	7.1
Yes	123	87.9	Are there enough pastures?		
No	17	12.1	Yes	50	35.7
Use of licking stones			No	90	64.3
Yes	105	75.0			
No	35	25.0			

Table 8.
General problems and expectations of enterprises

	n	%
What are your general problems on the enterprises?		
High feed and labour costs - inability to sell products at value price	50	35.7
High feed and labour costs - inability to sell products at value price- pasture problem-health problems-finding a shepherd	68	48.6
High feed and labour costs - transport - finding a shepherd	22	15.7
What are the problems you face while breeding livestock?		
Marketing-pasture-shepherd-animal movements-high feed costs	57	40.7
Inability to reach technical staff - shepherd - animal movements - high cost of feed and treatment services - marketing	83	59.3
Problems you encountered regarding animal husbandry during the pandemic and their effects		
Inability to access health services - marketing disruption - economic uncertainty - transportation disruptions (animal movements - feed supply)	42	30.0
Inability to access health services - marketing disruption - economic uncertainty - transportation disruptions (animal movements - feed supply) - inability to reach technical personnel - disruptions in registration and tagging processes - inability to reach the buyer - inability to receive support on time	98	70.0
What are your expectations from animal husbandry?		
Shepherd-feed-breeding-health insurance support	67	47.9
Shepherd-feed-breeding-health insurance-pasture support and pasture improvement	73	52.1

General Problems and Expectations of Enterprises

The general problems of the farms and the expectations of the breeders are given in Table 8. The most common problems encountered in the enterprises where the study was carried out were high feed and labour costs, while the most common problems were not being able to sell the products at their value, pasture problem, health problems and the problem of finding a shepherd. 59.3% of the breeders stated the problems they encountered in animal husbandry as inaccessibility to technical personnel, shepherd, animal movements, high cost of feed and treatment services and marketing. On the other hand, 70% of the breeders reported that the problems they encountered while raising livestock increased during the pandemic period and that they were exposed to many negativities such as inaccessibility to health services, disruption of marketing, economic uncertainty, disruptions in transportation (animal movements, feed supply), inaccessibility to technical personnel, disruption in registration-cubing procedures, inaccessibility to buyers,

and inability to receive supports on time. Studies have reported that global livestock supply chains also experienced disruptions due to the emergence of Covid-19 in early 2020 (Hashem et al., 2020; Almadani et al., 2021). Among the main impacts experienced by the agricultural sector, disruptions and delays in cultivation activities in both animal and plant production due to the quarantine and restrictions imposed have caused producers to remain below optimum production levels and thus reduced their income (Faturokhman et al., 2022). In their study, Deeh et al. (2020) stated that the impact of the Covid-19 crisis on animal production was serious. No sector, including industrial animal husbandry, is adequately prepared for this crisis. Covid-19 has revealed the vulnerability of animal production practices and demonstrated the urgent need for systemic change (Garcés, 2020).

Conclusion and Recommendations

The fact that the breeders in the farms where the study was carried out are in the middle age group and their educational status is higher than the results of similar studies conducted in our country may provide an advantage in the adaptation of innovations in animal husbandry activities in the region. It was determined that sheep and goat husbandry enterprises mostly do not keep records. In all livestock farms, keeping records is very important for increasing productivity and thus increasing profitability. Record keeping primarily enables the individual identification of the animal. For this reason, generalisation of record keeping in sheep and goat husbandry is important for the improvement of animal husbandry in the region. In the fight against diseases, it is very important to have a sick animal compartment in farms. In order to prevent the transmission of various disease-causing agents to other animals, these compartments should be located away from the barn. Body care and cleaning in sheep can be provided by giving body baths to animals in a good and practical way, but body bathing is mostly not applied to animals in enterprises. This situation is also undesirable in terms of animal welfare. For a profitable and sustainable production, especially the enterprises should be informed in terms of breeding, flock health and management and practical training should be provided.

Similar to the results of the study, there is a problem of finding shepherds in many regions of our country. In order for the shepherding profession to regain its importance, it is necessary to diversify and spread in many regions the practices such as certified shepherding, which have been carried out in recent years by the relevant institutions, and to make the shepherding profession economically viable. It is also important to communicate this situation accurately so that it can be accepted by all sections of society. In recent years, breeders have been challenged by rising feed costs and

low product prices. In addition to increasing support for the development of sheep and goat husbandry, the improvement and strengthening of the social rights of breeders will contribute to improving and promoting the image of animal husbandry in the eyes of society.

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