Turkish Journal of Agriculture - Food Science and Technology, 11(10): 1847-1854, 2023
DOI: https://doi.org/10.24925/turjaf.v11i10.1847-1854.6127

Turkish Journal of Agriculture - Food Science and Technology

Available online, ISSN: 2148-127X | www.agrifoodscience.com | Turkish Science and Technology Publishing (TURSTEP)

Examination of Structural Characteristics and Biosecurity of Sheep Farms in Niğde Province

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ARTICLE INFO

Research Article

Received : 27-04-2023
Accepted : 09-10-2023

Keywords:
Animal health
Biosecurity
Cultivation
Niğde
Sheep production

ABSTRACT

The aim was to examine the structural features and biosecurity practices of sheep farms operating in Niğde province. For this purpose, 75 farms operating in the region were classified according to size (number of animals) and production system (extensive and intensive) and, they were compared in terms of typology and biosafety. In this context, a face-to-face survey was conducted with the owners or authorized persons of the small, medium and large size farms and the data collected from the farms about technical, sanitation-hygiene and health protection were comparatively presented. According to the findings obtained from the study, manure and wastes produced in 24% of farms were seen randomly throwing into the environment, and the differences observed between farms depending on the farm size were found significant ($P<0.05$). These farms can become a potential source of environmental and odor pollution. In addition, it was determined that disinfection was not applied to a large extent (97.30%) as a preventive measure at farm and shelter entrances ($P>0.05$). At the end of the study, it has been concluded that the typology and biosafety practices could be an important support for future strategic programs against disease and other factors which affects the production of the Niğde region.

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Introduction

The precautions taken to ensure and protect the continuity of animal health can be defined as “biosecurity”. It can be said that animal welfare for farms with successful biosecurity practices will be high and accordingly the yield will increase. However, biosecurity practices are often neglected in Türkiye, especially in sheep and goat production. Although the costs of taking biosecurity precautions may seem initially unnecessary, these practices will not only protect animals, but also support profitable production by increasing productivity. In addition, it is an issue that should be considered pollution that will occur during intensive use of natural resources in order to increase production per unit area. In this context, the issues of protecting natural life and organic production gain importance. At the same time, the negative effects of the uncontrolled and intensive use of some substances on biology cause the existence of some new diseases. Greenhouse gases emerging in animal production and the inability to effectively manage waste cause pollution of the environment. Depending on this, some unfavourable conditions may arise in production and human health. The role of small-scale producers in the livestock sector is not given much importance. However, in case of a health problem that may arise in the biosecurity management of small-scale farms, large-scale farms will also be at risk in terms of sustainability. For this reason, small-scale farms that have not taken biosecurity precautions are defined as high-risk groups in animal production When manure or waste resulting from animal production is not stored under appropriate conditions, it can become a potential source of pollution by creating environmental, visual and accompanying odour pollutions (Atılgan et al., 2006). Since the manure kept in unsuitable open conditions will cause environmental pollution, the manure must be stored in closed storage for future evaluation. For this reason, it is recommended to plan manure storage where the manure produced in the farms can be properly stored within certain periods (Karaman, 2006).

Since sheep production in Türkiye is predominantly small-scale and based on pasture, the animal products obtained constitute the main food source of agricultural farms, and accordingly, income from sheep production is generally at low levels. For this reason, efficient and profitable production should not be expected in every region of Türkiye with widespread production. However, sheep production should be made more profitable and sustainable in order to increase the income of sheep production farms from this production branch and thus their contribution to the Turkish economy. In this case, it is important to accelerate the concentration in regions where sheep production can become widespread and to ensure sustainable production in other regions. At this point, the most important question is which production system will be used where and how. It is very important to determine and define the structural and production characteristics of the existing sheep and goat farms in that region.

In the current study, the status of biosecurity practices and their structural characteristics in sheep farms operating at different scales and systems in districts of Niğde province were revealed. Also; there is almost no data on the level of biosecurity practice in livestock farms across Türkiye. Based on this, there has been no previous study to determine the biosecurity level of sheep farms in Niğde province. In particular, work-based studies by way of sampling in the field are of great importance in defining the problems in production and revealing their solutions. It has been concluded that such a study is necessary and important, taking into account the importance of ovine production activities from past to present, the presence of animals, their place in the country's agenda and their production capacity. In this study, it is aimed to raise awareness about the importance of biosecurity, the issue of biosecurity, especially in the province or the area where it is applied.

Material and Methods

In the study, face-to-face surveys with the owners or responsible persons of 75 sheep farms in the districts of the Niğde province in Türkiye were constituted to data of the study. The surface area of Niğde province is 7312 km² and its altitude is 1229 meters. It is also located between 34° 33′ 0″ East longitude and 37° 52′ 59″ North latitude. The survey areas are shown in Figure 1.

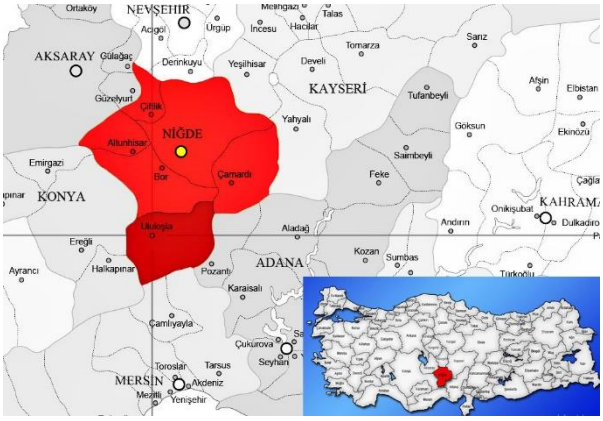

Figure 1. Districts of the Niğde province

A total of 75 surveys were conducted in Niğde/Center (2), Ulukışla (55), Çiftlik (1), Altunhisar (5), Bor (8) and Çamardı (4) districts. Farms were determined according to data obtained from the Niğde Directorate of Provincial Agriculture and Forestry. Subsequently, a survey was conducted that allowed analyzing these farms in terms of both typological and biosecurity points of view. The farms participating to the survey were selected to represent best the districts in terms of animal existence and production system. Accordingly, 25 farms were selected for each scale, including small (100 animals and less), medium (100-300 heads) and large (larger than 300 animals). Primarily the production type, housing, care and feeding methods of the farms with 24 questions prepared within the scope of the survey were determined and then the status of the farms on animal diseases, hygiene, manure and waste managements were revealed. Simple random sampling method was used to determine the number of farms to which the surveys were applied. The number of farms to represent the population in districts of Niğde province was found with the help of the following formula.

$$n = (N\ x\ p\ x\ q\ x\ 1.96^2)/((N-1)\ x\ d^2)$$

Since the number of farms in districts of Niğde province is N=539, if the sheep presence rate is assumed as p=0.5, the sample size necessary to estimate a 5% error level with q=1-p, d=0.12 deviation is approximately 67 farms. The demographic characteristics (Table 1) of the farms formed the study material were determined with nine questions asked in the survey.

Statistical analysis of the collected data was made with the help of the SPSS program. Technical, sanitation-hygiene and health protection analysis of farms depending on farm scales and production systems were done with the Chi-Square independence test.

Results and Discussion

The status of both typology and biosecurity of the farms determined were analysed by the survey. The findings of the research were examined as three sub-headings; technical, sanitation-hygiene and health protection as given below.

Technical Analysis of Farms

Türkiye with its natural and economic conditions, agricultural structure and traditions is a country suitable for sheep and goat production. In addition, considering Türkiye's geographical structure and pasture areas, it has been considered that sheep production is a low-cost extensive production activity. In the present study, 41% of the sheep farms in the districts of Niğde province were determined members of the national farmer registration system. The purpose of production in these farms was as follows; meet the family needs at 9.3%, provide financial income at 57.3% and as a habit at 32.0%, respectively. According to the present study, it has been revealed that the main purpose of farms making sheep production is to maintain a living by providing financial income. This finding was similar to the results of studies conducted by Karaman et al. (2012), Karakuş and Akyol (2013), Altınçekiç (2014) and Yerebakan (2017).

Table 1. Demographic characteristics of the farms

Parameters	Frequency	Percent (%)
The main purpose of sheep production		
Meeting family needs	7	9.30
Financial gain	43	57.30
Habit	24	32.00
All	1	1.30
National registration system membership		
Yes	41	54.70
No	34	45.30
The production system		
Intensive	10	13.30
Extensive	65	86.70
Type of barn		
No barn	4	5.30
Tarpaulin	17	22.70
Under of house	22	29.30
Reinforced concrete	31	41.30
Other	1	1.30
The number of employees in farm		
1-3	6	8.00
4-6	57	76.00
7 and more	12	16.00
The main source of the farm incomes		
Animal husbandry	70	93.30
Other	5	6.70
Dealing with non-animal production branches		
Yes	46	61.30
No	29	38.70
Farm owner's experience (years)		
0-9	6	7.90
10-19	16	21.30
20-29	31	41.20
30 and more	22	29.30
Farm scale		
Small (less than 100 heads)	25	33.33
Medium (between 100-300 heads)	25	33.33
Large (more than 300 heads)	25	33.33
Total	75	100

According to the small, medium and large scale status of the farms in the region where the study was conducted, the number of employees was determined between 4-6 people at a large rate such as 57.1%, 88.9% and 84.0%, respectively. Karakaya and Kızıloğlu (2014) reported that more than 4 employees in 75% of the farms that were small ruminant production in Bingöl province. In another study that examined the general structure of small ruminant production in Van province, the researchers reported that 9.1% of farms were operated by one person, 32.6% with two people, 28.8% with three people, 20.7% with four people and 8.8% with five people (Gezici, 2018). Although the number of employees in farms was diverse but in general operated by between 4-6 people. The most important factors affecting the number of employees of farms were the number of family individuals and the scale of the farm. In the current study, 38.70% of the farms were detected only engaged in sheep production, while 61.30% were engaged in other agricultural production together with sheep production. The rate of small, medium and large-scale farms engaged in different agricultural activities together with sheep production was almost 78.6%, 66.7% and 40%, respectively, this rate was observed to decrease while the scale rises up. In the studies conducted in Sivas, Muğla and Van provinces on the general structure of sheep production, the rate of farms engaged in non-livestock agriculture branches was determined %78,48, %48,0 and %96,0, respectively (Gezer, 2010; Aydın and Keskin, 2018; Gezici, 2018). In this context, the results of the current study were consistent with the literature, and it was revealed by the studies that sheep production was carried out together with various agricultural branches depending on the region and the scale of the farm. Due to the cold and snowy winter months in Niğde province, reinforced concrete barns were seen used the most by 41.30%, followed by under of houses with 29.30% and tarpaulin barns with 22.70%. The findings of the current study were similar to the results of the studies conducted by Karaman et al. (2012) and Meşe (2019) on the type of barns. Although the barns were seen generally cheap and primitive in sheep production in Türkiye, the characteristics, availability and cost of the material, especially the climatic conditions affect the structure of the barn. It was found that 70.50% of the surveyed farm

owners had a work experience of 20 years and more, and sheep production in the region was the main source of income for 93.30% of breeders. These results show that sheep production was carried out in the region for many years and it was an important production area for the region. It was detected that production was continued by breeders with at least 10 years of experience in many studies where the experience periods of breeders engaged in sheep production are examined (Acar and Ayhan 2012; Karakaya and Kızıloğlu 2014; Türkan, 2017; Aydın and Keskin, 2018; Karadaş, 2018). The declarations of the breeders engaged in sheep production for many years were consistent with the results of the present study.

The technical criteria (Table 2) of farms were detected with eight questions asked in the survey.

According to this, all the animals in region grazed on pasture almost 10 months of the year. This finding was similar to many studies that the farms operating sheep production in different regions of Türkiye benefit from pasture to a large extent (Gezici, 2018; Karagöz, 2019). Although the nutrition of small ruminant animals in Türkiye is largely dependent on pasture, there are many studies reporting that the available pastures are insufficient in terms of quantity and quality (Aksoy and Yavuz, 2012; Yerebakan, 2017; Bakır and Mikail, 2019). The production objectives of farms in sheep production may vary depending on the habits of the producer and market opportunities (Koyuncu et al. 2006). The primary production of the sheep farms in the region was determined meat production. The differences observed in milk, wool and manure production depending on the scale of the farms were found significant (P<0.01), while the differences observed in milk and wool production depending on the production system were significant (P<0.01).

Table 2. Technical analysis of the farms

Parameters	Frequency (%)		P	
			SC	PS
Grazing state in pasture				
Yes	75 (100.00)		-	-
No	--			
Production direction	Yes	No		
Meat	74 (98.70)	1 (1.30)	0.329	0.133
Milk	20 (26.70)	55 (73.30)	0.002**	0.001**
Wool	23 (30.70)	52 (69.30)	0.001**	0.001**
Manure	42 (56.00)	33 (44.00)	0.001**	0.170
The feeds used in feeding	Yes	No		
Barley	43 (57.30)	32 (42.70)	0.069	0.174
Corn	22 (29.30)	53 (70.70)	0.001**	0.055
Bran	14 (18.70)	61 (81.30)	0.027*	0.384
Hay	73 (97.30)	2 (2.60)	0.438	0.250
Alfalfa	45 (60.00)	30 (40.00)	0.135	0.005**
Silage	35 (46.70)	40 (53.30)	0.361	0.321
Pulp	26 (34.70)	49 (65.30)	0.023	0.002**
Concentrate feed	68 (90.70)	7 (9.30)	0.859	0.005**
Other	16 (21.30)	59 (78.70)	0.108	0.999
Storage state of feed				
Feed warehouse	40 (53.30)		0.002**	0.451
Under of house	11 (14.70)			
Under of tarpaulin	14 (18.70)			
Other	10 (13.30)			
Availability of different animals in feed warehouse and barn areas				
Yes	18 (24.00)		0.803	0.695
No	57 (76.00)			
The use state of manure	Yes	No		
I'm selling	20 (26.70)	55 (73.30)	0.168	0.452
I'm throwing	18 (24.00)	57 (76.00)	0.031*	0.999
I'm using myself	39 (52.00)	36 (48.00)	0.007**	0.999
The distance between manure store and barn				
0-20 m	48 (64.00)		0.035	0.275
21-30 m	5 (6.60)			
31 m more	18 (24.00)			
I can't store	4 (5.30)			
Availability of different animals in manure store				
Yes	34 (45.30)		0.686	0.497
No	41 (54.70)			

SC-Scale; PS-Production system. **Significant at the 1% probability level, *Significant at the 5% probability level.

The number of farms producing milk, wool and manure in addition to meat production in small-scale farms was observed to be higher than the other sizes, and the number of farms producing these products decreased while the size increased. In addition, in terms of production type, milk and wool production was found significantly higher in extensive system than intensive system. Keskin (1996) reported similar findings to these results. The researcher reported that sheep production was carried out primarily for the purpose of meat production. Some farmers have not milked their ewes and left the whole milk to the newborns up to 4-5 months. Hay, concentrated feed and barley were determined used extensively in the nutrition of sheep in the region (Table 2). There were significant differences in using corn ($P<0.01$) and bran ($P<0.05$) depending on the scale of the farms. The significant differences between farms in terms of alfalfa, pulp and concentrated feed used in the feeding of animals were observed depending on the production system ($P<0.01$). The use of corn and bran in small-scale farms was significantly higher than in medium and large-scale farms, and corn was not detected used in the feeding of animals in large-scale farms. While alfalfa was used in all farms in the intensive production system, it was observed that the rate of use of alfalfa in the extensive system was 53.80%. Also, the use of pulp for feeding the animals in the intensive system was significantly higher than in the extensive system. Although the feed raw materials used in sheep feeding vary according to the scales and production systems of farms, sources such as barley, wheat, corn, pulp, bran, alfalfa, corn silage and concentrated feed were mostly found used on farms (Karakuş and Akyol, 2013; Yerabakan, 2017; Aydın and Keskin, 2018). The storage status of feeds varied depending on the scale of the farms ($P<0.01$). It was determined that 53.30% of the farms were stored in the feed warehouse. Small and medium-sized farms kept their feedstuff mostly in the feed warehouse, while the feeds on large-scale farms were kept equally in the warehouse, under the houses, under the tarpaulin and other options.

The uses of manure produced in the farms were seen to vary depending on the scale of the farms and their production in other agricultural branches. The manure obtained in small-scale farms was mostly used to meet their own needs such as their field and/or their vegetable production. In addition, the manure obtained from big scale farms was sold or discarded. Özsayın and Everest (2019) reported that 92.8% of the producers engaged in sheep production in Çanakkale Gökçeada used their manure in own agriculture production. In similar studies, the researchers reported that was revealed that sheep breeders in Ardahan, Karaman and Yozgat provinces used own land of a significant part of manure obtained from animal production and the remaining part was sold or was evaluated as fuel (Şahinli 2014, Demir et al. 2015; Tamer and Sariozkan, 2017). In a study conducted in Van province, it was stated that 44.6% of the breeders used their manure as fuel in winter period (Karakuş and Akkol, 2013).

Sanitation and Hygiene Analysis of Farms

The cleanliness and hygiene practices in animal production may affect the welfare of animals and cause positive or negative changes in the amount of yield obtained from them. In addition, in cases where cleaning and hygiene conditions are not provided at enterprises, different diseases may occur in animals depending on poor environmental conditions. In this context, it is known that basic cleaning and hygiene practices applied in enterprises are an important part of biosecurity. The sanitation and hygiene criteria (Table 3) of the farms were revealed with eight questions asked in the survey. The barns were seen usually cleaned once a month on the farms where the study was carried out, and significant differences were observed in the cleaning times of the barn, feeder and waterer depending on the scale and production system of the farms (Table 3). As the scale of the farm grows, barn cleaning ($P<0.05$) was observed doing more often, while the feeder and waterer cleaning ($P<0.01$) was seen less frequently. In addition, when the farms were compared according to the production systems, the cleaning of barn, feeder and waterer was detected more frequently in intensive production ($P<0.01$). In a study conducted by Altınçekiç (2014), barn cleaning was determined usually done once a year in sheep farms operating in Bursa province. Although similar results were found in the study conducted by Kılıç et al. (2013) and Alkan et al. (2013) state that barn cleaning was mostly done daily. The differences observed in the cleaning frequency of barn, feeder and waterers; it was thought to be caused by parameters such as animal presence, ground type of barn, climate and number of employees and evaluation of manure. In the farms where the study was conducted, a large part such as 93.30% of the breeders reported that they had special work suits for the farm. Contrary to the results of the study, Altınçekiç (2014), who examined the structural status of sheep farms in Bursa province found that none of the breeders wore special work clothes during the feeding or milking of sheep in farms, and breeders thought that such an application was unnecessary. In addition, the precaution taken during the treatment process of sick animals in the intensive production system were determined to be more stringent ($P<0.05$). Regardless of the scale and production type of the farms; it was stated that barns were ventilated during the winter months, disinfection was applied at farm and barn entrances, and waste such as injector were thrown to trash after vaccine and drug application ($P>0.05$). It was determined that the measures taken during the treatment of sick animals were significantly affected by the production system of the farms ($P<0.05$). Although protective measures are taken during the treatment of sick animals in all farms with intensive production systems, it has been reported that these measures are not taken into account in a large proportion of 32.3% in farms with intensive production models.

Health Protection Analysis of Farms

The presence of diseases in livestock farms can cause economic losses. Diseases occurring in animals lead to economic losses in the farms as a result of death and yield losses, high treatment costs, and time and effort losses. For this reason, it can be said that biosecurity precautions applied in animal production will support profitable production in terms of farms' economy. Regardless of the scale and production system, 98.70% of the breeders were seen to receive veterinary support in case of any disease in the farms. In addition, it was stated that the treatments and vaccines were applied by themselves in some of the small-scale farms. In a similar study conducted on sheep farms in Bursa province, it was stated that vaccination practices of

breeders mainly had performed by veterinarians, and some breeders performed by veterinary health technicians or themselves of these practices (Altınçekiç, 2014). In studies conducted on farms operating sheep production in various regions, veterinary service was stated received at a high rate in case of any disease or application of vaccination (Karakuş and Akyol, 2013; Yerabakan, 2017; Özsayın and Everest, 2019). In the region conducted the present study was seen that the biggest health problem of the farms was lameness.

The most frequently applied vaccines during the year were determined Antivariolic, Brucella, Plague and Enterotoxaemia vaccination (Table 4). Internal-external parasites (P<0.05) and lameness (P<0.01) among the diseases observed on farms, and in terms of Enterotoxaemia (P<0.01) in the applied vaccines were found significant differences observed depending on the scale of farms. While internal-external parasites were observed intensely in small-scale farms, this problem was determined to decrease as the scale grows. However, the lameness in the farms was observed to increase with the growth of the scale. In addition, the Enterotoxaemia vaccine was determined mostly applied in small-scale farms and the application of this vaccine was observed to decrease as the scale grows. As well as ticks and fleas within external parasites depending on farms's size were a common problem, it was determined that 81.30% of the farms had a housefly problem. The production system was determined a significant effect on the housefly problem observed in the farms and the housefly problem was more common in the extensive system (P<0.05). In addition, the differences observed depending on the scale of farms on tick and lice observed as external parasites were detected to be significant (P<0.01). Lice were seen more intensively on small-scale farms, and this problem was seen to decrease with the growth of the farm scale. Generally, no scientific techniques for health protection are used in extensive farms, especially in the fighting against external parasites. Instead, some techniques traditionally applied by breeders are used. These techniques; It is carried out by searing, spraying with some herbal substances, treatment with diesel fuel or similar methods.

Table 3. Sanitation and hygiene analysis of the farms

Parameters	Frequency (%)	P	
		SC	PS
Cleaning state of barns (times)			
Every day	1 (1.30)	0.040*	0.001**
Once a week	9 (12.00)		
Once a month	48 (64.00)		
Once every three months	7 (9.30)		
Once every six months	8 (10.70)		
Not cleaning	2 (2.70)		
Cleaning state of feeders (days)			
1-3	19 (25.30)	0.008**	0.001**
4-7	20 (26.70)		
8 and more	35 (46.70)		
Not cleaning	1 (1.30)		
Cleaning state of waterers (days)			
1-3	21 (28.00)	0.001**	0.001**
4-7	30 (40.00)		
8 and more	22 (29.30)		
Not cleaning	2 (2.70)		
Ventilation state in winter of the barns			
Yes	72 (96.00)	0.431	0.645
No	3 (4.00)		
Disinfection application at the entrance of the farm and barn			
Yes	2 (2.70)	0.500	0.343
No	73 (97.30)		
The use of specific work suits for farm			
Yes	70 (93.30)	0.450	0.999
No	5 (6.70)		
Preventive measures in the treatment of sick animals			
I'm wearing gloves	41 (54.70)	0.179	0.013*
I'm wearing a mask	-		
I wear gloves-mask	13 (17.30)		
Other	-		
I don't take precautions	21 (28.00)		
The state of the waste like injector after the application of the vaccine or drug			
I throw to trash	73 (97.30)	0.342	0.748
I throw randomly	1 (1.30)		
I'm reusing	1 (1.30)		

SC-Scale; PS-Production system. **Significant at the 1% probability level, *Significant at the 5% probability level.

Table 4. Health protection analysis of the farms

Parameters	Frequency (%)		P	
			SC	PS
In case of illness of animals	Yes	No		
I treat myself	8 (10.70)	67 (89.30)	0.168	0.999
I get support from other farmers	4 (5.30)	71 (94.70)	0.108	0.999
I get support from the pharmacist	3 (4.00)	72 (96.00)	0.187	0.999
I get support from veterinarians	74 (98.70)	1 (1.30)	0.329	0.999
Common disease in farm	Yes	No		
Internal-external parazite	10 (13.30)	65 (86.70)	0.031*	0.124
Lameness	61 (81.30)	14 (18.70)	0.003**	0.999
Enterotoxemia	22 (29.30)	53 (70.70)	0.433	0.467
Brucellozis	14 (18.70)	61 (81.30)	0.527	0.677
Other	9 (12.00)	66 (88.00)	0.194	0.999
The vaccines applying to animals	Yes	No		
Brucella	71 (94.70)	4 (5.30)	0.187	0.999
Plague	49 (65.30)	26 (34.70)	0.790	0.478
Pox	73 (97.30)	2 (2.70)	0.105	0.999
Lameness	12 (16.00)	63 (84.00)	0.741	0.999
Enterotoxemia	34 (45.30)	41 (54.70)	0.001**	0.497
Alum	11 (14.70)	64 (85.30)	0.664	0.001
Internal-external parasites	4 (5.30)	71 (94.70)	0.106	0.443
External parasites observed in animals	Yes	No		
Tick	35 (46.70)	40 (53.30)	0.001**	0.500
Lice	8 (10.70)	67 (89.30)	0.002**	0.068
Flea	45 (60.00)	30 (40.00)	0.135	0.298
Not external parasite	23 (30.70)	52 (69.30)	0.003**	0.714
Housefly problem in farm				
Yes	61 (81.30)		0.527	0.016*
No	14 (18.70)			
Isolation application at new animal entry into the herd				
Isolation does not apply	47 (62.70)		0.137	0.154
Isolation is applied for 7 days	18 (24.00)			
Isolation is applied for 14 days	7 (9.30)			
Isolation is applied for more than 14 days	3 (4.00)			
The grazing of animals in pastures where sick animals are found				
Yes	68 (90.70)		0.005**	0.046*
No	7 (9.30)			
The state of dead animals				
I throw randomly	6 (8.00)		0.155	0.030*
I'm burying	29 (38.70)			
I'm burying with lime	16 (21.30)			
I throw in the water	24 (32.00)			

SC-Scale; PS-Production system. **Significant at the 1% probability level, *Significant at the 5% probability level.

A study examining the structural status of sheep farms in Antalya province found that 95.6% of farms had performed Enterotoxaemia, 85.6% Alum, 84.4% Brucella, 76.7% Blue Tongue, 67.8% Plague and 63.3% Smallpox vaccines during the year (Yerebakan, 2017). However, the incidence of the housefly problem, which was caused great economic damage to the farms was reported as 92.3% by researchers. In a similar study conducted by Karakuş and Akyol (2013) in Van province, only 46.19% of all farms reported that they had performed Enterotoxaemia, Smallpox, Brucella and Alum vaccines in animals. In the same study, the most common health problems in farms were reported external parasites with 65.36% and respiratory tract diseases by 52.19%. In another study conducted in Bursa province, the main vaccines commonly used against epidemic diseases observed in farms was found to be Smallpox, Alum, Brucella, Enterotoxaemia and Anthrax (Altınçekiç, 2014). All these results were consistent with the findings of the current study, and the observed disease types and the vaccines applied in sheep production operating in different regions of Türkiye were revealed largely similar.

Quarantine was determined to not applied to the animals that were added to the herd from other farms in the majority of the farms regardless of the scale or production system. In a study conducted in Bursa province contrary to the current study, all breeders were reported to apply quarantine to animals at new animal entrances to the farm (Altınçekiç, 2014). The breeders in the present study stated that they grazed their animals in the pastures where the sick animals were found and they did not take any precaution in this situation. In this context, the differences between farms in terms of farm scale ($P<0.01$) and production system ($P<0.05$) were determined to be significant. The grazing

status of animals in pastures existing of diseased animals was determined to be the lowest in small-scale farms and the highest in large-scale farms. Although the practices on the condition of the dead animals in the farms differ, the dead animals were determined to be buried at a high rate in farms with an intensive production system, and they were thrown into the water or buried in extensive farms ($P<0.05$).

Conclusion

At the end of this study, it has been observed that biosecurity precautions were not taken, sanitation and hygiene rules were not followed on the farms in Nigde province, as a result of these, the breeders complain about animal health. It is thought that the most effective solution to eliminating these complaints and deficiencies can be achieved through correct planning, training, awareness-raising and incentives activities. Thus, it has been concluded that the typology could be an important support for the future strategic programs against disease and hygiene, which to date affect the production of our region.

Acknowledgements

The authors would like to offer special thanks to Çukurova University Scientific Research Projects Unit for supporting this work (Project No: FYL-2019-11404).

Conflict of Interest

No potential conflict of interest relevant to this study was reported.

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