



RESEARCH ARTICLE

Farm Management and Socio-Economic Structure of Cattle Enterprises in Eastern Anatolia: A Case Study of Selim District, Kars Province

Veysel Fatih Özdemir • Oğuzhan Tarhan • Bahri Bayram

Atatürk University, Faculty of Agriculture, Department of Animal Husbandry, Erzurum/Türkiye

ARTICLE INFO

Article History

Received: 30.07.2024

Accepted: 24.12.2024

First Published: 31.12.2024

Keywords

Cattle enterprises

Eastern Anatolia

Farm management

Selim District

Socio-economic structure

ABSTRACT

This study investigated the socio-economic characteristics of cattle farms in the Selim district of Kars province. A face-to-face survey was conducted with 350 cattle farm owners selected by random sampling method. Frequency analysis was used to interpret the data obtained. The majority of the farmers in the district were above 40 years of age, while the share of farmers younger than 40 years was only 19.7%. The share of the farmers with primary school (34.4%) or secondary school (33.5%) education was considerably high. A large majority of the farmers in the district had over (68.5%) 20 years of cattle farming experience while only 6.0% had less than 10 years of experience. It was found that 76.8% of the enterprises in the district had 5 or more people in the family. Crossbreds of European and indigenous cattle breeds were quite common (72.3%) in the district. Simmental was determined to be the most commonly raised European breed (44.8%). The 30.9% of enterprises had cattle between 20-30. The majority (50.6%) of the enterprises had 10-20 lactating cows. It was found that 50.9% of the farmers engage in both meat and milk production in their enterprises, while 48.0% engage solely in milk production. It was determined that 52.0% of the enterprise owners in the district were members of associations and cattle breeders' association was the most preferred (90%) among the farmers. High feed prices (98.3%) and diseases (33.1%) were indicated as the major problems by the farmers. In addition, credit support (88.3%), supply of quality breeding stock animals (34%), veterinary services (39.4%) and support in marketing of the products obtained (25.1%) were the main expectations of the farmer from the government.



Please cite this paper as follows:

Özdemir, V. F., Tarhan, O., & Bayram, B. (2024). Farm management and socio-economic structure of cattle enterprises in Eastern Anatolia: A case study of Selim District, Kars Province. *Journal of Agricultural Production*, 5(4), 272-282. <https://doi.org/10.56430/japro.1524942>

1. Introduction

The livestock sector, which has a strategic position in Türkiye, is the main source of livelihood in developing regions and contributes to meeting the demand for protein of animal origin. The sector also provides raw materials for many industries, especially dairy, meat, leather, textiles, pharmaceuticals and cosmetics, and contributes to national income, employment as well as exports (Ergün & Bayram, 2021). Cattle farming is one of the most important sub-sectors of the livestock sector in Türkiye. According to current

statistics, approximately 92.9% of total raw milk and 70.1% of the total red meat production in Türkiye is obtained from cattle (TURKSTAT, 2024). The Eastern Anatolian region in particular plays an important role in Türkiye's livestock sector. About 37.53% of the country pastures and meadow area is located in this region (Okcu, 2020). This region is home to over 19 per cent of the total cattle population of the country. According to actual data, the cattle population of the eastern Anatolia region is 3073955 (TURKSTAT, 2024). Kars province ranks 2nd in the region and 4th in the country with 615279 cattle population as compared to other provinces of

✉ Correspondence

E-mail address: bbayram@atauni.edu.tr

Türkiye. Kars is a highland province with an altitude of 1750 meters, and livestock farming plays an important role in the economy of the province. The abundance of grasslands, meadows, pastures and plateaus, which are of great importance for cattle farming, has made cattle farming one of the main economic activities of the province from the past to the present. The province has a total of 8 districts, and after the central

district, Selim district has the highest cattle population. The number of cattle in the district is 107140 and increasing every year (Figure 1). Cattle farming has a very special place in the economy of the district, providing a livelihood for the majority of the population. The district is home to 17 per cent of the province's cattle population (TURKSTAT, 2024).

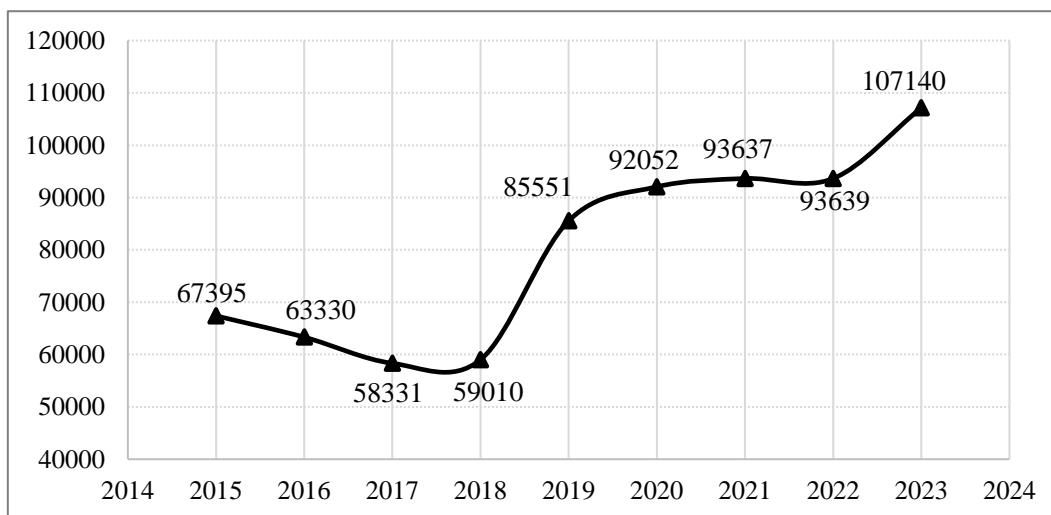


Figure 1. Changes in the number of cattle in Selim district over the years (TURKSTAT, 2024).

Despite the increase in the number of cattle, the population of the district has decreased from 24204 in 2015 to 21178 in 2023. Cattle production in the district faces several problems and challenges. The decline in the district's population and the increase in the average age of livestock farmers are among the most significant. Majority of the cattle enterprises in the district is small or medium scale. In order to ensure the development and sustainability of the farming sector, economic and social status in these enterprises should be taken into consideration (Diler et al., 2022). Improving the economic and social conditions of farmers will help them adapt to future challenges and maintain their operations over the long term. In order to achieve this, it is very important to reveal the problems of farmers in the region. This study aimed to determine the farm management and socio-economic structure of cattle enterprises in the Selim district of Kars province, identify the existing problems, and provide solutions to achieve a sustainable cattle farming.

2. Materials and Methods

The study has been approved by Atatürk University, Agricultural Faculty Ethics Committee Chairmanship in 2024 (Decision no: 2024/1).

The research involved administering questionnaires to 350 cattle enterprise owners, randomly selected from 3925 cattle enterprises in the Selim district of Kars province. Face-to-face surveys were conducted with these 350 enterprise owners.

The data obtained were transferred to Microsoft Office Excel. Numerical and proportional values were obtained by frequency analysis in descriptive statistics in the statistical program SPSS 20.0v. The numerical and proportional values were used to create graphs and interpret the results. In determining the sample size, the following method was utilized (Arıkan, 2007).

$$n = \frac{N \cdot t^2 \cdot p \cdot q}{(N-1) \cdot D^2 + t^2 \cdot p \cdot q} \quad (1)$$

n = minimum number of necessary samples

N = population size

D = acceptable or desired sampling error (5%)

t = table value

p = the rate to be calculated (0.5)

q = 1-p

$$n = \frac{3925 \cdot (1.96)^2 \cdot 0.5 \cdot (1-0.5)}{(3925-1) \cdot 0.05^2 + (1.96)^2 \cdot 0.5 \cdot (1-0.5)} = 350$$

3. Results and Discussion

The distribution of enterprise owners by age is shown in Figure 2. It was found that 3.7% of the farmers were less than 30 years old, 16.0% were between 31-40 years old, 42.0% were between 41-50 years old, 28.9% were between 51-60 years old and 9.4% were 61 years old and above. The average age of the cattle farmers in Selim district is predominantly falls between

41-50 years old. Our results indicate that the interest of the younger population (<30 age group) in animal farming is not at the desired level. Similar results have been reported in other studies conducted in other parts of Türkiye. For instance, Diler et al. (2022) reported that the average age of cattle farmers in İspir district of Erzurum was 55.2 years. In Eyyübiye district of Şanlıurfa Province, 41.5% of enterprise owners were determined to be between 46-55 years of age (Doğanay & Yanar, 2023). Additionally, the average age of the cattle farmers was reported to be 47.6 years in Hatay province and 44.0 years in Aksaray province (Paksoy & Bulut, 2020; Tapkı

et al., 2018). These results suggest that the average age of the cattle farmers in Türkiye is increasing and younger generations don't find cattle farming attractive. This trend is not unique for Türkiye. Mzingula (2019) found that the majority (43.3%) of the cattle farmers in Tanzania were between 40-59 years of age. The average age of the cattle breeders was reported to be 47 years in Finland (Sahlström et al., 2014) and 48 years in Nigeria (Saleh, 2018). Together, these results indicate a global trend of ageing cattle farmers, with younger generations less interested in the profession.

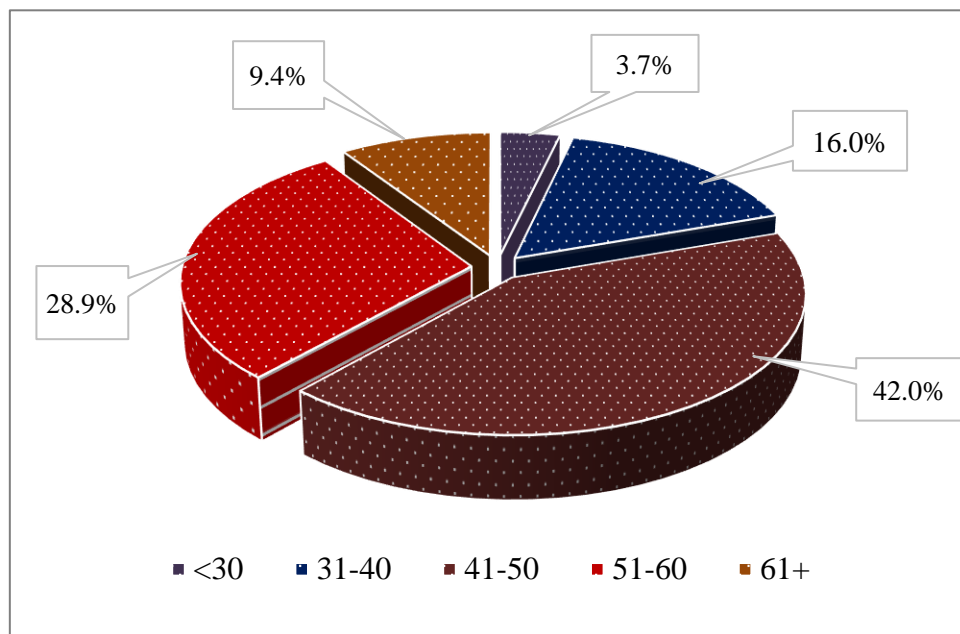


Figure 2. Age of enterprise owners (years).

It was found that 1.4% of the enterprise owners in the district were illiterate, 34.4% were primary school graduates, 33.5% were secondary school graduates, 28.9% were high school graduates and 1.7% were university graduates (Figure 3). The majority of the farm owners in Selim district were primary school graduates, and the rates of primary and secondary school graduates (34.4% and 33.5%, respectively) were noticeably high while the share of university graduates was considerably low. Studies conducted in the eastern regions of Türkiye revealed that the education level of farmers is lower and is not in desired level. For instance, the share of primary school graduates was 51.7% and university graduates was 0.8% among farmers in Çatak, Özalp and Erciş districts of Van province (Terin & Ateş, 2010). Similarly, the percentage of cattle farmers who are primary school graduates was reported

as 55.6% in Kars province (Tilki et al., 2013). Majority of the cattle farmers (54.2%) in Giresun province was primary school graduates (Tugay & Bakır, 2009). Additionally, in Diyarbakır Province 43% of the dairy cattle farmers were primary school graduates and 13% were illiterate, while only 5% were university graduate (Tutkun et al., 2017). On the other hand, in Tekirdağ province, the share of high school and university graduates was reported to be 15% and 14% respectively (Soyak et al., 2007). Education level of the farmers is highly important in terms of economic efficiency of cattle enterprises. It was observed that the majority of the farmers in Selim district of Kars province had low level of education. Higher education levels among farmers correlate with increased profitability of their enterprises (Tilki et al., 2013).

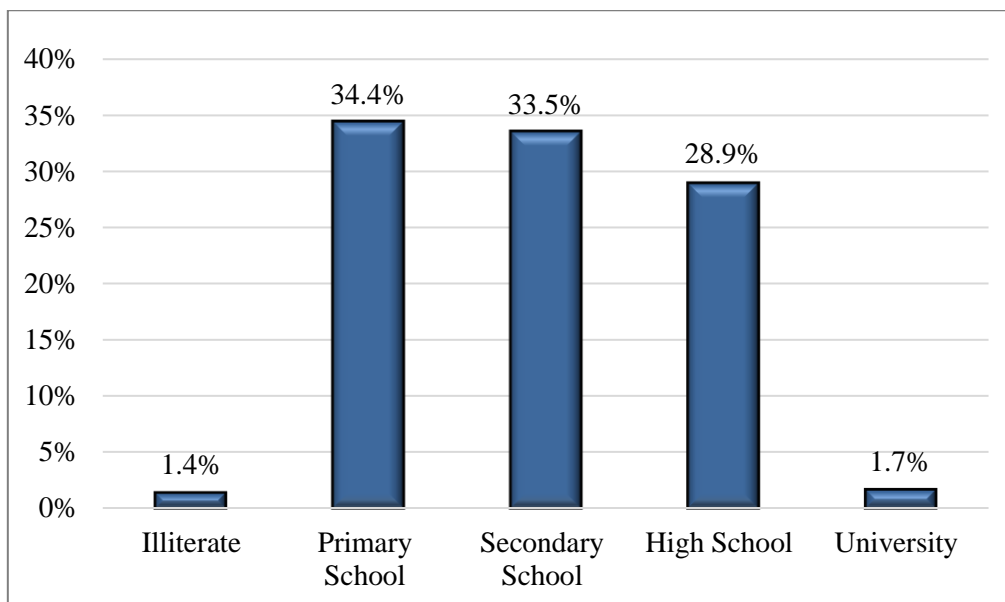


Figure 3. Education status of the farmers.

In Selim district of Kars province 6.0% of the farm owners had less than 10 years of experience, while 25.4% had 10-20 years, 37.1% had 21-30 years, 27.1% had 31-40 years, and 4.3% had more than 40 years of cattle farming experience. Majority of the farmers in the district had over (68.5%) 20 years of cattle raising experience while only 6.0% had less than 10 years of experience. Similarly, Bakan and Aydın (2016) reported that the average cattle farming experience of farmers were 24.3 years in Ağrı province. While 82.5% of the cattle farmers has over 20 years of cattle farming experience in Tekkeköy district of Samsun province (Kaygısız & Özkan, 2021). Similarly, in Kars province the average cattle farming experience of farmers were found to be 30.2 years (Tilki et al.,

2013). Additionally, Duguma et al. (2012) found that 50% of the cattle farmers in Ethiopia had 15 years of experience. However, in Nigeria 62% of farmers were reported to have less than 10 years of cattle breeding experience (Saleh, 2018). While in South Africa 41.4% of the farmers had over 21 years of farming experience (Grobler et al., 2008). The experience among cattle farmers in Selim district was determined to be higher compared to similar studies. However, despite this apparently advantageous situation, the high proportion of older farmers with low levels of education in the district is a disadvantage and a serious threat to the sustainability of cattle farming in the district.

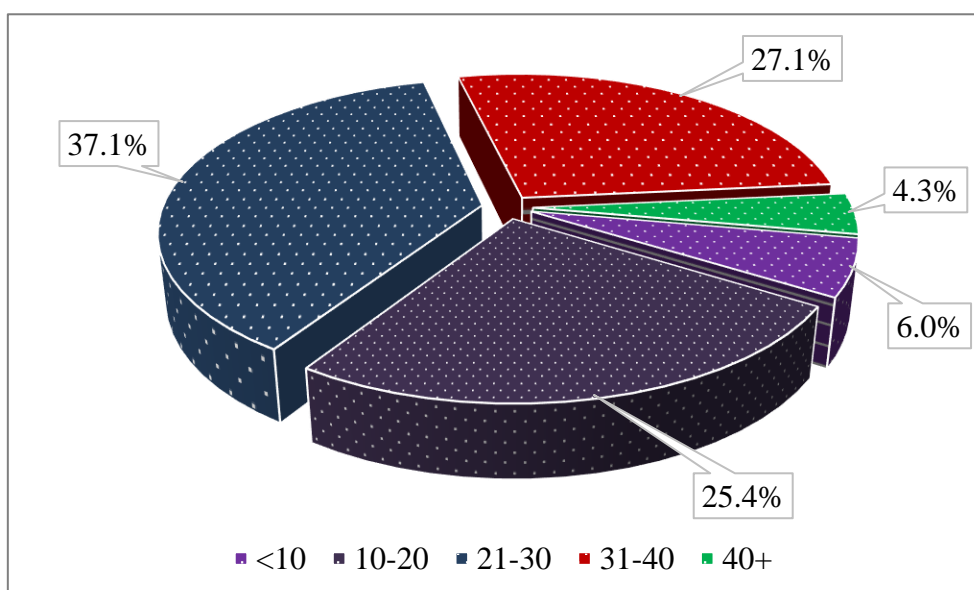


Figure 4. Farming experience (years).

In the current study we also instigated the family populations of the enterprises in the district. It was determined that the majority (76.8%) of the farms had 5 or more individuals in the family. Only 23.2% of the farms had less than 5 individuals in the family. 63.1% of the farms had 5-7 people in the family (Figure 5). Similarly, Güler et al. (2016) found that the average family population in Hınıs district of Erzurum was 5.2 in the cattle enterprises. While majority of the enterprises in Kahramanmaraş province had 3-5 people in the family (Kaygısız et al., 2010). In İspir district of Erzurum over 70% of the farmers had 3-5 people in the family (Diler et al., 2022). Similarly, majority of the enterprises in Karaçoban district of

Erzurum was determined to have 4 (15.2%), 5 (23.5%) and 6 (20.6%) individuals in their families (Yanar et al., 2024). In the studies conducted in Western Kenya and Uganda number of individuals in the farmer's families were reported to be 8 and 8.7 respectively (Ahikiriza et al., 2021; Amimo et al., 2011). The family population of the enterprises is important for the sustainability and production capacity of the enterprises. Based on the findings, it was observed that the average number of family members in enterprises in the district is sufficient when compared to other regions, which is promising for the continuity of the enterprises.

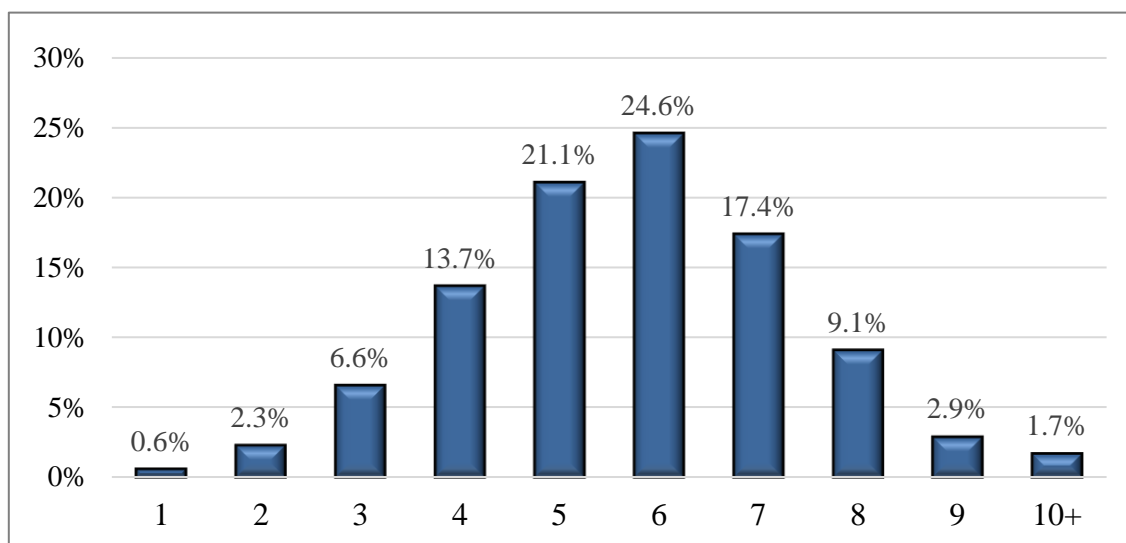


Figure 5. Number of family members.

Majority of the enterprises had crossbreds in their enterprises (72.3%). Simmental was the most preferred (44.8%) European cattle breed by the farmers. The proportions of Brown Swiss and indigenous cattle breeds were 22.6% and 38.0%, respectively. Holstein Friesian was the least preferred (2.6%) cattle breed among the cattle farmers in the district (Figure 6). Similarly, in Eyyübiye district of Şanlıurfa province Simmental was the most widely raised European cattle breed (59.3%). However, indigenous breeds were raised only in 5.2% of the enterprises (Doğanay & Yanar, 2023). Moreover, in Giresun province the majority of the cattle raised in the farms were crossbreds (71.1%), and 23.6% of the cattle were indigenous breeds (Tugay & Bakır, 2006). Şeker et al. (2012) reported that 46.9%, 37.2% and 15.9% of the farmers reared indigenous, crossbreds and European breeds respectively in cattle farms located in Muş province. On the other hand, 71% of the cattle farmers in Eastern Mediterranean raised European dairy cattle breeds in their farms while the share of crossbreds was 19% (Boz, 2013).

In the questionnaire the farmers were also asked about the reasons why they had chosen these breeds. The majority of

farmers (65.4%) stated that they had chosen these breeds because they were adapted to the conditions of the region and 38.6% of farmers cited being more resistant to diseases as the reason. On the other hand, 35.7% of them (farmers keeping European breeds or their crossbreds) stated that their reason for choosing these breeds was their high yield (Figure 6). In a similar study carried out in Eyyübiye district of Şanlıurfa province, where the proportion of indigenous breeds is much lower, the majority of farmers (55.6%) stated that they chose their breeds because of their high yield (Doğanay & Yanar, 2023). In comparison with the other regions, the preference for indigenous breeds or their crossbreds with European breeds is higher in the region. The main reason for this result is the harsh climatic and geographical conditions of the region. The adaptation of European breeds in this region is very difficult. The second reason is that cattle farming in the district is largely based on traditional methods. The stables and rearing conditions are more suitable for indigenous cattle breeds. Therefore, most of the breeders prefer to cross these breeds with indigenous breeds, which are highly adapted to the conditions of the region.

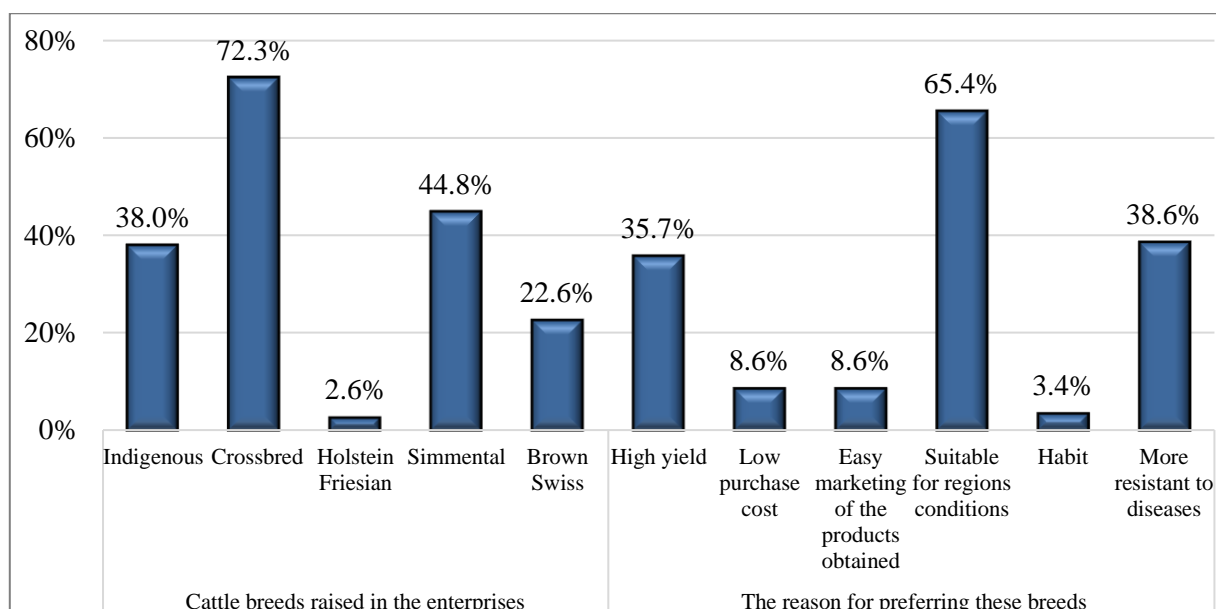


Figure 6. Cattle breeds raised in the enterprises and the reason for preferring these breeds.

The distribution of cattle, cows and heifers (female cattle that have not yet given their first birth) on the enterprises is shown in Figure 7. In Selim district, 6.0% of the enterprises had between 1-10 cattle, 26.3% had between 10-20, 30.9% had between 20-30, 19.1% had between 30-40, 10.3% had between 40-50, 7.4% had 51 or more cattle (Figure 7). The majority of enterprises had between 20 and 30 cattle (30.9%). The majority of farms (50.6%) also had between 10 and 20 lactating cows in the barn. While 89% of the farms had less than 10 heifers, only 11% of them had 10 or more heifers. In a similar study conducted in the Gönen district of Balıkesir province, researchers found that the average number of lactating cows was 7.14 (Y. Özdemir et al., 2021). Average number of cattle

in the cattle enterprises in Iğdır province was reported as 20.9 head (Yılmaz et al., 2020). In addition, the average number of cattle in Çankırı province was reported to be 30 and 220 in traditional and modern farms, respectively (Kaba & Çanakçı, 2020). In Kahramanmaraş province, the number of cattle in the enterprises was between 1-5 in 52% of the enterprises and 6-10 in 26% of the enterprises (Kaygısız et al., 2010). Additionally, the average number of lactating cows in the enterprises in Torul district of Gümüşhane province was reported as 9.2 by C. Y. Özdemir et al. (2023). In Selim district, majority of the enterprises are determined to be middle sized with 21-30 cattle and 10-20 lactating cows.

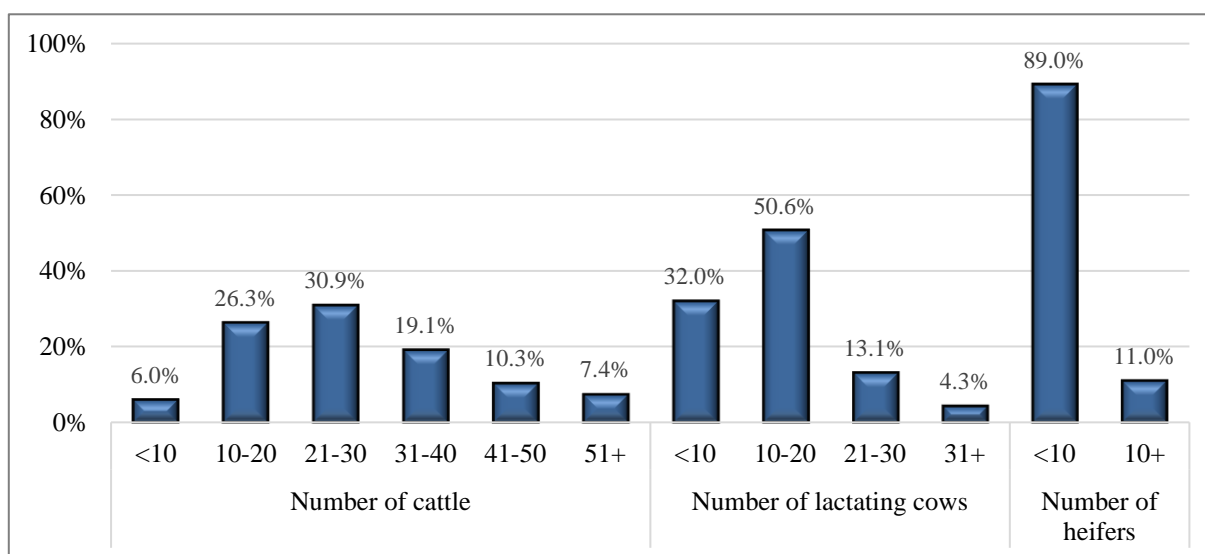


Figure 7. Distribution of cattle, lactating cows, and heifers by number in the district.

It was found that 50.9% of the farmers engage in both meat and milk production in their enterprises, while 48.0% prefers milk production and sell their male calves at early ages. Only 1.1% of the farmers engage solely in meat production (Table 1). In a similar study conducted in Hınıs district of Erzurum province Güler et al. (2016) reported that 94.0% of the farmers engaged in both meat and milk production. Similarly, in Muş province 79.2% of the cattle farmers were determined to focus on combined rearing system (meat and milk production) in their enterprises (Şeker et al., 2012). In a similar study conducted in Southern Nigeria, Ahaotu et al. (2013) found that 77.5% of the farmers engaged solely in milk production. In Türkiye, meat production farms are not common. Thus, meat production is based mostly on the males of dairy cattle or multipurpose cattle breeds. As in the country, the preference of multipurpose cattle is widespread in Selim district of Kars province.

It was determined that 12% of the enterprises in the district had 1, 52.3% had 2, 24.9% had 3, 7.4% had 4 and 3.4% had 5

working person. Majority of the farms had 2 or 3 employees. Similarly, Diler et al. (2022) reported that 43.7% and 33.5% of the farms had 2 and 3 employees respectively in the farms in İspir district of Erzurum. Additionally, in Hınıs district of Erzurum Güler et al. (2016) found that majority of the farms had 2 or 3 employees. On the other hand, Daş et al. (2014) indicated that majority of the farms in Bingöl province had 3-5 people. Since the big share of the farms in the district is small or middle scale, only family members were working in the farms. It was found that in 92.7% of the farms, only family members were working. Only 3.2% of the enterprises had external employees, while in 4.1% of the farms both workers and family members engaged in the care of animals (Table 1). Similarly, Ünalan et al. (2013) found that 92% of the cattle enterprises relied solely in family labor in Niğde province. Additionally, the share of farms using solely family members in the cattle enterprises was 96.6% in İspir district of Erzurum (Diler et al., 2022).

Table 1. Distribution of farm types, number of employees, and labor source.

Type of Cattle Farming	Frequency	Percentage (%)
Meat Production	4	1.1%
Milk Production	168	48.0%
Meat and Milk Production	178	50.9%
Total	350	100.0%
Number of employees working in the cattle farm		
1	42	12.0%
2	183	52.3%
3	87	24.9%
4	26	7.4%
5+	12	3.4%
Total	350	100.0%
Labor Source		
Only family labor	292	92.7%
Worker	10	3.2%
Family labor and worker	13	4.1%
Total	315	100.0%

It was determined that 52.0% of the enterprise owners in the district were members of associations and 48.0% were not (Figure 8). In a similar study conducted in Tekkeköy district of Samsun revealed that 62.5% of the cattle farmers were member of milk producer's union (Kaygısız & Özkan, 2021). Furthermore, 75% of the farmers were members of any unions or cooperatives in Tokat province (Çallı, 2016), while only 30.0% of the enterprise owners were members of any agricultural cooperative in eastern Mediterranean region (Boz, 2013). In İspir province of Erzurum, only 27.9% of the cattle farmers had membership to agriculture related associations (Diler et al., 2022). Among the farmers who were members of an association, 90% were members of a cattle breeders'

association, 7.2% were members of a village cooperative, and 2.8% were members of other associations. In a similar study, Özyürek et al. (2014) found that in Çayırılı district of Erzincan province 55.0% of the farmers were not members of any organization, while 13% were members of cattle breeders' association and 32.0% were members of other agricultural cooperatives. Such organizations play a crucial role in providing services to farmers and producers, including facilitating access to markets and enabling small enterprises to create network. In the district, the reason for the membership to unions or cooperatives was either to meet agricultural input needs or to benefit from agricultural supports.

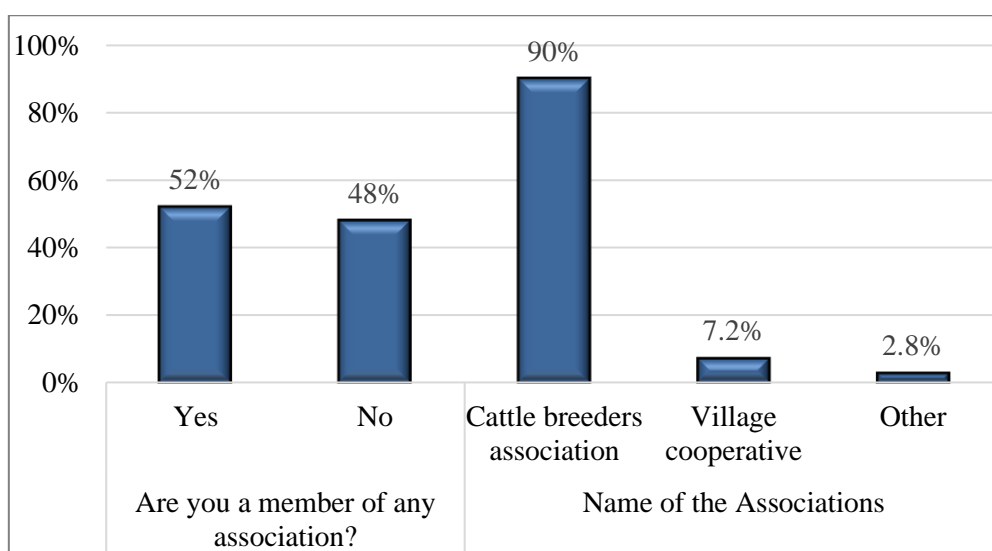


Figure 8. Association membership status in the district.

Respondents were also asked whether or not they were satisfied with cattle farming. The majority of the farmers (66.5%) indicated that they found cattle farming fulfilling. While 33.5% were not satisfied with this activity. Cattle farming was the only economic activity of the 84.3% of the enterprise owners. Only a small proportion of the enterprises (15.7%) had other occupation in addition to cattle farming (Table 2). Cattle farming was reported by 91.1% of enterprise owners as the main source of income. In a similar study conducted in İspir district of Erzurum, 41.6% of the farmers were found to have other occupations in addition to cattle farming (Diler et al., 2022). In Muş and Sivas provinces the share of enterprise owners having additional occupations to cattle farming were reported to be 48% and 37%, respectively (Hozman & Akçay, 2016; Şeker et al., 2012). Similarly, in Hınıs district of Erzurum only 17% of the cattle farmers were reported to have additional occupation by Koçyiğit et al. (2016).

Based on the respondents' answers, high feed prices stand out as the biggest problem facing farmers in the district. Almost all farmers (98.3%) reported that feed is expensive. Diseases were also cited as a major problem by 33.1% of farmers. In addition, 22.6%, 20.6% and 17.4% of the farmers, respectively, indicated that difficulty in accessing feed, lack of market and difficulty in handling cattle were among the problems faced in this activity. Only 9.7% of farmers replied that cattle farming

was not profitable (Table 2). High feed prices have been identified as the main problem in many studies conducted in different parts of Türkiye. In Giresun province 93.7% (Tugay & Bakır, 2009), and in Ödemiş district of İzmir 78.3% (Koyubenbe, 2005) of the farmers indicated high feed prices as the main problem. Similarly, Akbay et al. (2023) reported that high feed prices were among the main problems faced by dairy cattle enterprises in Türkiye.

Participants were also asked about their expectations from the governments. A vast majority of the farmers (88.3%) indicated that credit support was their main expectation from the government. Veterinary services (39.4%), supply of quality breeding stock (34%) and marketing support (25.1%) were also among the main expectations of farmers in the district (Table 2). Only 10% of the farmers replied that they expected educational programs from the government. Similarly, Şeker et al. (2012) found that the major expectations of the farmers were credit support with reasonable conditions (42.7%), veterinary services (29.1%) and support in marketing the products (19.1%) in Muş province. On the other hand, only 2.7% of farmers stated that they expected technical educational programs. In addition, credit support (67.6%) and supply of quality breeding stock (53.1%) were reported as the main expectations of farmers in Giresun province (Tugay & Bakır, 2009).

Table 2. Information about the cattle farming practices, satisfaction, and challenges.

Do you find cattle farming satisfying?	Frequency	Percentage (%)
Yes	232	66.5%
No	117	33.5%
Total	349	100.0%
Do you have any other occupation?		
Yes	55	15.7%
No	295	84.3%
Total	350	100.0%
Why do you engage in cattle farming?		
Main source of livelihood	319	91.1%
Habit	14	4.0%
Contribution to family income	118	33.7%
Just to meet my families need for animal products	14	4.0%
What are the main problems you face in cattle farming		
Feed is expensive	344	98.3%
Feed is hard to obtain	79	22.6%
Diseases	116	33.1%
Cattle are difficult to care for	61	17.4%
Market insufficiency	72	20.6%
It is not profitable	34	9.7%
What are your expectations from the government?		
Credit support	309	88.3%
Supply of quality breeding stock animals	119	34.0%
Educational programs	35	10.0%
Marketing support	88	25.1%
Veterinary services	138	39.4%

4. Conclusion

This study investigated the socio-economic characteristics of cattle farms in the Selim district of Kars province. The majority of the farmers in the district were above 40 years of age, while the share of farmers younger than 40 years was only 19.7%. Younger generation's interest in cattle farming in the district is determined to be insufficient. This situation seems to be a significant threat for the future of cattle farming in the district. The enterprises in the district were mostly small and medium scale family type. The level of education of the farmers in the district was considerably low. The majority of the farmers were primary school (34.4%) or secondary school graduate (33.5%). On the other hand, the experience level of the farmers was significantly higher. However, this is also a major problem for the district since a large number of farmers are elderly and have limited education. This situation poses a significant challenge to the sustainability of livestock production in the district, as it may limit the ability to adapt to new practices and technologies that are essential for long-term viability. For this reason, the active participation of young and educated entrepreneurs in agricultural activities is crucial both for the future and sustainability of cattle farming in the district. The

family population of the enterprises is important for the sustainability and production capacity of the enterprises. It was found that 76.8% of the enterprises in the district had 5 or more people in the family which is sufficient when compared to other regions. This situation seems promising for the continuity of cattle farming in the district. It was found that 48% of the farms in the district are not members of any agricultural organization. In addition, a number of challenges such as high feed prices, diseases and market shortages are threatening livestock production in the district as stated by the farmers. Increasing the activities of agricultural unions and associations to overcome these problems would increase farmers' interest in such organizations. The majority of farmers indicated that their main expectations from the government were credit support, veterinary services, marketing support and the supply of quality breeding stock. The government can play a more active role to address the challenges faced by farmers and meet their expectations by improving market and veterinary services, providing loans or feed incentives as well as supplying high quality breeding stock cattle in the region. However, prioritizing the activities and initiatives of cattle breeders' associations and other agricultural unions over reliance on

government support alone could also help to solve the problems of the cattle farmers. These associations can offer educational programs, technical assistance, and shared resources such as group purchasing, access to shared equipment, or cooperative marketing strategies to improve production efficiency, providing targeted and specialized support according to the needs of breeders.

Compliance with Ethical Standards

The study has been approved by Atatürk University, Agricultural Faculty Ethics Committee Chairmanship in 2024 (Decision no: 2024/1).

Conflict of Interest

The authors declare that they have no conflict of interest.

References

- Ahaotu, E. O., Madubiuke, F. N., & Ifut, O. J. (2013). Smallholder dairy production in Southern Nigeria: Production, management and milk quality problems. *International Journal of Agriculture and Biosciences*, 2(2), 76-81.
- Ahikiriza, E., Wesana, J., Gellynck, X., Van Huylenbroeck, G., & Lauwers, L. (2021). Context specificity and time dependency in classifying sub-Saharan Africa dairy cattle farmers for targeted extension farm advice: The case of Uganda. *Agriculture*, 11(9), 836. <https://doi.org/10.3390/agriculture11090836>
- Akbay, C., Çetinkaya, S., & Akbay, F. (2023). Türkiye'de coğrafi bölgelere göre süt sığırcılığı işletmelerinde yem bitkisi üretim durumu. *Turkish Journal of Agricultural and Natural Sciences*, 10(4), 1156-1166. <https://doi.org/10.30910/turkjans.1285087> (In Turkish)
- Amimo, J. O., Thumbi, S., Inyangala, B., Junga, J., & Mosi, R. (2011). Socioeconomic characteristics and perceptions of cattle keepers and constraints to cattle production in western Kenya. *Livestock Research for Rural Development*, 23(6).
- Arıkan, R. (2007). *Araştırma teknikleri ve rapor hazırlama*. Asil Yayın Dağıtım. (In Turkish)
- Bakan, Ö., & Aydın, R., (2016). Ağrı ili süt sığırcılığı işletmelerinin sosyo-ekonomik özellikleri. *Atatürk University Journal of Agricultural Faculty*, 47(2), 113-122. (In Turkish)
- Boz, İ. (2013). Doğu Akdeniz Bölgesi'nde süt sığırcılığı yapan işletmelerin yapısı, sorunları ve çözüm önerileri. *KSÜ Doğa Bilimleri Dergisi*, 16(1), 24-32. (In Turkish)
- Çallı, A. (2016). *Türkiye'de uygulanan hayvancılık destekleme politikalarının Tokat ili hayvancılık işletmeleri açısından değerlendirilmesi* (Master's thesis, Gaziosmanpaşa University). (In Turkish)
- Daş, A., İnci, H., Karakaya, E., & Şengül, A. (2014). Bingöl ili damızlık sığır yetiştiricileri birliğine bağlı sığırcılık işletmelerinin mevcut durumu. *Turkish Journal of Agricultural and Natural Sciences*, 1(3), 421-429. (In Turkish)
- Diler, A., Özdemir, V. F., Aydın, R., Yanar, M., Koçyiğit, R., & Tosun, M. (2022). Socio-economic structure of cattle enterprises in northeast Anatolia region: An example of İspir county of Erzurum Province. *Black Sea Journal of Agriculture*, 5(2), 150-159. <https://doi.org/10.47115/bsagriculture.1069977>
- Doğanay, S., & Yanar, M. (2023). Güney Doğu Anadolu Bölgesi sığırcılık işletmelerinin sosyo-ekonomik yapısı: Şanlıurfa ili merkez Eyyubiye ilçesi örneği. *Journal of Animal Science and Economics*, 2(1), 13-21. <https://doi.org/10.5152/JASE.2023.1165020> (In Turkish)
- Duguma, B., Kechero, Y., & Janssens, G. P. (2012). Survey of major diseases affecting dairy cattle in Jimma town, Oromia, Ethiopia. *Global Veterinaria*, 8(1), 62-66.
- Ergün, O. F., & Bayram, B. (2021). Türkiye'de hayvancılık sektöründe yaşanan değişimler. *Bahri Dağdaş Hayvancılık Araştırma Dergisi*, 10(2), 158-175. (In Turkish)
- Grobler, S., Scholtz, M., Bester, J., Mamabolo, J., & Ramsay, K. (2008). Dairy production systems in the emerging and communal sectors of South Africa: Results from a structured survey. *Applied Animal Husbandry & Rural Development*, 1, 25-30
- Güler, O., Aydın, R., Yanar, M., Diler, A., Koçyiğit, R., & Avcı, M. (2016). Erzurum ili Hınıs ilçesi sığırcılık işletmelerinin sosyo-ekonomik yapısı. *Alinteri Journal of Agriculture Science*, 30(1), 27-37. (In Turkish)
- Hozman, S. B., & Akçay, H. (2016). Sivas ili damızlık sığır yetiştiricileri birliğine üye süt sığırcılığı işletmelerinin bazı teknik ve ekonomik özellikleri. *Tarım Ekonomisi Dergisi*, 22(1), 57-65. (In Turkish)
- Kaba, H., & Çanakçı, M. (2020). Geleneksel ve modern büyükbaş hayvancılık işletmelerinin tarımsal yapı ve mekanizasyon özelliklerinin kıyaslanması: Çankırı İli Örneği. *COMU Journal of Agriculture Faculty*, 8(2), 367-378. <https://doi.org/10.33202/comuagri.722392> (In Turkish)
- Kaygısız, A., Tümer, R., Orhan, H., & Vanlı, Y. (2010). Kahramanmaraş ili süt sığırcılık işletmelerinin yapısal özellikleri 4. işletmecilerin sosyal ve kültürel durumları. *Atatürk Üniversitesi Ziraat Fakültesi Dergisi*, 41(1), 39-44. (In Turkish)
- Kaygısız, A., & Özkan, İ. (2021). Samsun Tekkeköy ilçesindeki süt sığırcılık işletmelerinin yapısal özellikleri ve hijyen koşulları. *Harran Tarım ve Gıda Bilimleri Dergisi*, 25(2), 225-233. <https://doi.org/10.29050/harranziraat.879606> (In Turkish)

- Koçyiğit, R., Diler, A., Yanar, M., Güler, O., Aydın, R., & Avcı, M. (2016). Süt sığırcılığı işletmelerinde hayvan sağlığı, veteriner sağlık hizmetleri ve yetiştirici memnuniyeti: Erzurum ili Hınıs ilçesi örneği. *Türk Tarım ve Doğa Bilimleri Dergisi*, 3(1), 24-32. (In Turkish)
- Koyubenbe, N. (2005). İzmir İli Ödemiş İlçesinde Süt Sığırcılığının Geliştirilmesi Olanakları Üzerine Bir Araştırma. *Hayvansal Üretim Dergisi*, 46(1): 8-13. (In Turkish)
- Mzingula, E. P. (2019). Socio-economic impacts of smallholder dairy cattle farming on livelihood in Sungu ward of Lushoto district, Tanzania. *International Journal of Economics and Management*, 1(2), 41-49.
- Okcu, M. (2020). Türkiye ve Doğu Anadolu Bölgesi çayır-mer'a alanları, hayvan varlığı ve yem bitkileri tarımının mevcut durumu. *Atatürk Üniversitesi Ziraat Fakültesi Dergisi*, 51(3), 321-330. <https://doi.org/10.17097/ataunizfd.708884> (In Turkish)
- Özdemir, Y., Kınıklı, F., & Engindeniz, S. (2021). Süt sığırcılığı işletmelerinin yapısal özellikleri ve sorunları üzerine bir araştırma: Balıkesir'in Gönen ilçesi örneği. *Turkish Journal of Agricultural and Natural Sciences*, 8(4), 1001-1011. <https://doi.org/10.30910/turkjans.938077> (In Turkish)
- Özdemir, C. Y., Kaygısız, A., & Aydın, R. (2023). Gümüşhane ili Torul ilçesi süt sığırcılığı işletmelerinin sosyo-ekonomik durumu. *Palandöken Journal of Animal Sciences Technology and Economics*, 2(2), 38-43. <https://doi.org/10.5152/JASE.2023.1162878> (In Turkish)
- Özyürek, S., Koçyiğit, R., & Tüzemen, N. (2014). Erzincan ilinde süt sığırcılığı yapan işletmelerin yapısal özellikleri: Çayırılı ilçesi örneği. *Tekirdağ Ziraat Fakültesi Dergisi*, 11(3), 19-26. (In Turkish)
- Paksoy, M., & Bulut, O. D. (2020). Aksaray ilinde süt sığırcılığı yapan kooperatif ortaklarının sosyo-ekonomik özellikleri ve kooperatif - ortak ilişkilerinin incelenmesi. *International Journal of Agricultural and Wildlife Sciences*, 6(2), 252-262. <https://doi.org/10.24180/ijaws.684674> (In Turkish)
- Sahlström, L., Virtanen, T., Kyrrö, J., & Lyytikäinen, T. (2014). Biosecurity on Finnish cattle, pig and sheep farms-results from a questionnaire. *Preventive Veterinary Medicine*, 117(1), 59-67. <https://doi.org/10.1016/j.prevetmed.2014.07.004>
- Saleh, M. (2018). Socio-economic characteristics of dairy cattle farmers in Northern Nigeria. *Journal of Agricultural Extension*, 22(1), 266-276. <https://doi.org/10.4314/jae.v22i1.26S>
- Şeker, İ., Tasalı, H., & Güler, H. (2012). Muş ilinde sığır yetiştiriciliği yapılan işletmelerin yapısal özellikler. *Fırat Üniversitesi Sağlık Bilimleri Veteriner Dergisi*, 26(1), 9-16. (In Turkish)
- Soyak, A., Soysal, M. İ., & Gürcan, E. K. (2007). Tekirdağ ili süt sığırcılığı işletmelerinin yapısal özellikleri ve bu işletmelerdeki siyah alaca süt sığırlarının çeşitli morfolojik özellikleri üzerine bir araştırma. *Tekirdağ Ziraat Fakültesi Dergisi*, 4(3), 297-305. (In Turkish)
- Tapkı, N., Tapkı, İ., Dağıstan, E., Selvi, M. H., Kaya, A., Güzey, Y. Z., Demirtaş, B., & Çelik, A. D. (2018). Hatay ili damızlık sığır yetiştiricileri birliği üyesi işletmelerin sosyo-ekonomik özellikleri. *Hayvansal Üretim*, 59(1), 25-32. <https://doi.org/10.29185/hayuretim.410517> (In Turkish)
- Terin, M., & Ateş, H. Ç. (2010). Çiftçilerin örgütlenme düzeyi ve örgütlerden beklentileri üzerine bir araştırma: Van ili örneği. *Ege Üniversitesi Ziraat Fakültesi Dergisi*, 47(3), 265-274. (In Turkish)
- Tilki, M., Sarı, M., Aydın, E., Işık, S., & Aksoy, A. R. (2013). Kars ili sığır işletmelerinde barınakların mevcut durumu ve yetiştirici talepleri: I. mevcut durum. *Kafkas Üniversitesi Veteriner Fakültesi Dergisi*, 19(1), 109-116. <https://doi.org/10.9775/kvfd.2012.7282> (In Turkish)
- Tugay, A., & Bakır, G. (2006). Giresun yöresindeki süt sığırcılığı işletmelerinin ırk tercihleri ve barınakların yapısal durumu. *Atatürk Üniversitesi Ziraat Fakültesi Dergisi*, 37(1), 39-47. (In Turkish)
- Tugay, A., & Bakır, G. (2009). Giresun yöresindeki süt sığırcılığı işletmelerinin yapısal özellikleri. *Atatürk Üniversitesi Ziraat Fakültesi Dergisi*, 40(1), 37-47. (In Turkish)
- TURKSTAT. (2024). Turkish Statistical Institute. <https://www.tuik.gov.tr/>
- Tutkun, M., Denli, M., & Sessiz, A. (2017). Diyarbakır ili süt sığırcılığı işletmelerinin yapısal durum analizi. *Turkish Journal of Agriculture-Food Science and Technology*, 5(5), 476-483. <https://doi.org/10.24925/turjaf.v5i5.476-483.933> (In Turkish)
- Ünalın, A., Serbest, U., Çınar, M., Ceyhan, A., Akyol, E., Şekeroğlu, A., Erdem, T., & Yılmaz, S. (2013). Niğde ili süt sığırcılığı işletmelerinin mevcut durumu, başlıca sorunları ve çözüm önerileri. *Türk Tarım -Gıda Bilim ve Teknoloji Dergisi*, 1(2), 67-72. <https://doi.org/10.24925/turjaf.v1i2.67-72.34>
- Yanar, M., Koçyiğit, R., Diler, A., Aydın, R., Bayram, B., Yüksel, S., Özdemir, V. F., Ergün, O. F., & Tiryaki, A. (2024). Socio-economic structure of cattle enterprises operating in Karaçoban county of Erzurum province. *Journal of Animal Science and Economics*, 3(1), 1-7. <https://doi.org/10.5281/zenodo.10730987>
- Yılmaz, İ., Kaylan, V., & Yanar, M. (2020). Iğdır ili büyükbaş hayvan yetiştiriciliğinin yapısal analizi. *Iğdır Üniversitesi Fen Bilimleri Enstitüsü Dergisi*, 10(1), 684-693. <https://doi.org/10.21597/jist.567366> (In Turkish)