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Some Structural Features and Feeding Characteristics of Dairy Cattle Enterprises in Kastamonu Province

Kastamonu İli Süt Sığır İşletmelerinde Bazı Yapısal Özellikler ve Beslenme Karakteristikleri

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ABSTRACT: This study examines the structural features and producer characteristics of dairy cattle farms in Kastamonu province and its districts. Data were collected through surveys using a random sampling method. The study shows that most farms are small-scale family operations without external labor, and all are members of at least one agricultural union. Approximately 77.2% of farms produce their own roughage, while silage is the least used feed due to limited irrigation, small land areas, financial constraints, wild boar pressure, and lack of knowledge on silage preparation. Cattle are generally fed twice daily in barns, and in suitable areas, 83% of farms use pasture grazing. In the past decade, the number of farms has grown to supplement household income. While barns are adequately sized, bedding is not used due to financial limitations. Equipment such as automatic waterers, feed crushers, and mixers are commonly utilized, with 68% of farms using milking machines. Dairy products are sold through cooperatives and local markets or used for household consumption. Veterinary services are mainly provided by Provincial Directorates of Agriculture, with private veterinarians handling artificial insemination and major health issues. Farmers expect government support in low-interest loans, veterinary care, training, incentives, and grants.

Keywords: Cattle enterprises, Kastamonu province, nutritional characteristics, structural features

ÖZ: Bu çalışma, Kastamonu ili ve ilçelerindeki süt sığırı işletmelerinin yapısını ve üretici özelliklerini belirlemek amacıyla gerçekleştirilmiştir. Veriler rastgele örnekleme yöntemi kullanılarak anket yoluyla toplanmıştır. Çalışma, işletmelerin çoğunun dışarıdan işçi çalıştırmayan küçük ölçekli aile işletmeler olduğunu ve her birinin en az bir birliğe üye olduğunu göstermiştir. İşletmelerin %77,2'si kendi kaba yemini üretmekte, silaj ise en az kullanılan yem türüdür. Bu durumun nedenleri arasında yetersiz sulama, sınırlı arazi, mali yetersizlik ve yaban domuzu baskısı yer almakta; ayrıca silaj hazırlama konusunda bilgi eksikliği bulunmaktadır. Hayvanlar genellikle ahırda günde iki kez beslenmekte, uygun bölgelerde %83 oranında merada otlatılmaktadır. Son on yılda ek gelir amacıyla işletme sayısı artmıştır. Ahırlar hayvan başına yeterli büyüklüktedir, ancak mali yetersizlikten dolayı altlık kullanılmamaktadır. Süt üretiminde otomatik suluk, yem kırma ve yem karma makineleri kullanılmakta; sağım işlemleri %68 oranında makine ile yapılmaktadır. Ürünler kooperatifler ve mahalle pazarlarında satılmakta, ev ihtiyacına da ayrılmaktadır. Veteriner hizmetleri İl Tarım Müdürlüklerince sağlanmakta, özel veterinerler suni tohumlama ve ciddi hastalıklarla ilgilenmektedir. Üreticiler devletten kredi, teşvik, bilgi ve hibe desteği beklemektedir.

Anahtar Kelimeler: Sığırcılık işletmeleri, Kastamonu ili, beslenme karakterleri, yapısal özellikler

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1. INTRODUCTION

Türkiye is a country with significant potential in the cattle farming sector. In particular, cattle enterprises form one of the cornerstones of both the rural economy and the food sector. However, cattle enterprises in Türkiye exhibit considerable differences depending on various structural factors such as production efficiency, enterprise size, technology usage, and financial resources.

The protein value of preferred foods is crucial for adequate nutrition. Milk, meat, and eggs are important sources of animal protein. As Tüzemen (2015) reported approximately 35% (9.1 g) of the animal protein production per capita, which is around 26 g, comes from meat, 51% (13.2 g) from milk, and 14% (3.6 g) from eggs. According to data from 2018, the daily animal protein consumption per capita in Türkiye is 37.9 g, compared to the world average of 32.9 g, while the European Union (EU) average is 59.4 g (Ergün and Bayram, 2021). Despite the increase in protein consumption in Türkiye over the years, it remains below the EU average. In addition to protein consumption, the daily protein production per capita varies across continents and even countries. The differences in protein production between countries and continents often parallel to the level of development of the countries. This connection is particularly important in the production of animal-derived proteins. For example, the world average daily animal protein production per capita is 37.4 g, the EU average is 85.41 g, the average in less developed countries is 12.71 g, in African countries it is 15.69 g, and in Türkiye, it is 46.77 g. Accordingly, while Türkiye produces more animal protein than less developed countries and African nations, compared to the EU countries, the animal protein production in Türkiye is insufficient to adequately nourish its population (Akman, 2023).

Cattle are the most important source of meat and milk production in Türkiye (Tüzemen, 2015). According to FAO data for 2018, the annual per capita beef consumption in Argentina (55.4 kg), Brazil (37.5 kg), the United States (37.2 kg), Uzbekistan (28.5 kg), and Australia (28.2 kg) is as follows. In EU countries, the annual per capita beef consumption is 14.3 kg, while in Türkiye, it is 13.2 kg. The global average beef consumption is 9.1 kg (Ergün and Bayram, 2021).

The cattle farming market is important not only for meeting food demands with the increasing population but also in terms of utilizing labor and its share in exports. In developing regions, cattle farming provides resources for the food and textile industries, and contributes to the development of sectors such as feed and pharmaceuticals. Cattle farming is particularly intensively carried out in the villages and towns of Türkiye (Güven and Yavuz, 2020).

The number of cattle was 13.577 million in 1961, reached its lowest point in 2000 with 10.907 million, and increased to 18.155 million in 2020. In 2023, the cattle population was 16.583 million (Anonymous, 2023a). Compared to the year 2001, the cattle population increased by 68.79% by 2021, reaching 18.04 million. Of this, 98.97% consists of cattle. The cattle population was 10.55 million in 2001 and increased by 69.24%, reaching 17.85 million in 2021 (Dalgıç et al., 2023).

In the province of Kastamonu, where this study was conducted, the cattle population was 274,044 in 2018, 309,733 in 2019, 348,931 in 2020, 270,617 in 2021, 269,485 in 2022, and 269,640 in 2023, marking the lowest cattle population in the last five years. This represents a 1.60% decrease (Anonymous, 2023b).

In recent years, changes in Turkiye's demographic structure, rural-to-village migration, urbanization, bottlenecks in the agricultural sector, and developments in livestock farming have caused various impacts both nationwide and specifically in the province and districts of Kastamonu. In this context, many studies have been conducted nationwide regarding livestock enterprises. However, despite the increase in the number of enterprises in Kastamonu, the lack of sector-specific analysis of livestock farming has been considered a significant gap. To analyze the problems of cattle enterprises and identify the needs of entrepreneurs, it is necessary to conduct one-on-one interviews. These interviews aim to reveal the current situation of livestock farming and provide recommendations by developing new policies. In this study, the socio-economic characteristics of cattle farming enterprises in Kastamonu, their membership in unions and cooperatives, structural conditions, feed procurement methods, product sales, government expectations, and veterinary services were examined (Tüzemen, 2015; Bakan and Aydın, 2016). This study will assess the structural characteristics of cattle enterprises in Kastamonu, including factors such as farm size, production capacities, use of financial resources, and modernization processes, and discuss the current situation of the cattle breeding sector along with policy recommendations for the future.

2. MATERIALS and METHODS

As the research area, cattle breeding enterprises operating in Kastamonu and its districts were selected, and through a survey method, the socio-economic status, structural conditions, organizational status, feeding conditions of the cattle, product evaluations, and variables related to cattle health in these enterprises were organized.

The random minimum sampling technique was used in the study. The following formula was used to determine the sample size in cases where the variance is unknown, the population is finite, and there are categorical variables related to probability. The margin of error will be set at 5%, and the confidence level will be 95% (Özsağlıcak and Yanar, 2022).
According to the documents provided by the Provincial

Directorate of Agriculture, the number of cattle breeding enterprises in the region totals 18 202.

$$n = [N.t^2.p.q] / [(N-1) D2+t^2.p.q] \quad (1)$$

In this formula;

n = Sample size,
N = Population size,
D = Sampling error margin (0.05),
t = Table value (t = 1.96, α = 0.05),
p = Population proportion (0.05), q = 1 - p

n = [18,202 (1.96)² 0.05 0.95] / [18,201 (0.05)² + (1.96)² 0.05 0.95 = 72.7 enterprises. The minimum sample size, was calculated to be approximately 73. However, the sample size was rounded up to 100, and survey studies were conducted. The number has changed because enterprises did not answer some questions or because they gave more than one answer. The distribution of the surveyed enterprises by village and district is presented in Table 1 and in Figure 1. The data were obtained through the survey. The surveys were completed by visiting enterprises, conducting face-to-face interviews, and making observations. Frequency analyses were performed.

Table 1. Number of surveys conducted by districts

District	Number of cattle farming enterprise	Number of surveyed enterprise
Abana	49	-
Ağlı	316	1
Araç	1.058	6
Azdavay	459	1
Bozkurt	207	1
Cide	934	5
Çatalzeytin	289	1
Daday	798	9
Devrekani	1.477	7
Doğanyurt	398	2
Hanönü	306	1
İhsangazi	682	5
İnebolu	783	9
Küre	363	-
Merkez	4.336	23
Pınarbaşı	334	5
Seydiler	392	-
Şenpazar	278	2
Taşköprü	3.022	13
Tosya	1.721	9
Total	**18.202**	**100**

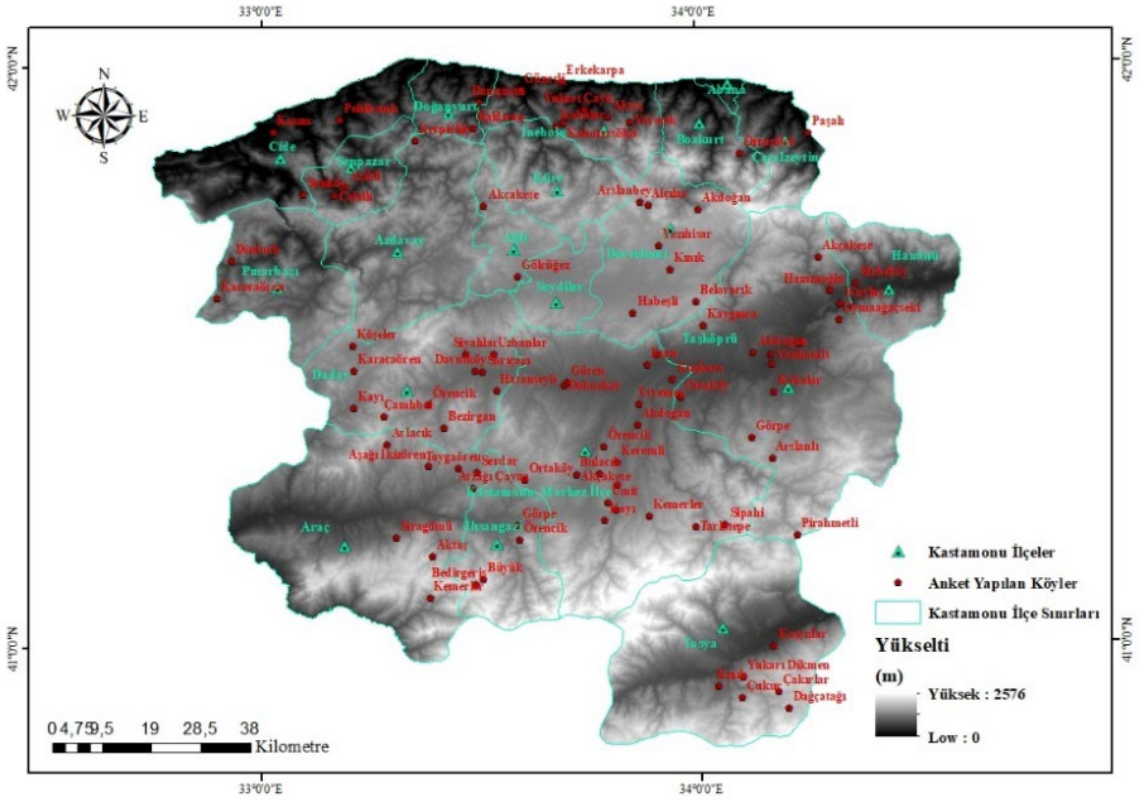

Figure 1. Villages and districts where the surveyed enterprises are located

3. RESULTS and DISCUSSION

The socio-economic structure of enterprise owners is directly related to livestock farming. Various factors, such as the experiences, education, knowledge levels, age, and attitudes of cattle farmers, play a significant role in livestock breeding, making the socio-economic characteristics of the farm owners important (Yüzbaşıoğlu, 2022). According to the survey results, data regarding the socio-economic structure of cattle farming enterprises

operating in the Kastamonu province and its districts are provided in Tables 2 and 3.

Table 2. Number and percentages of enterprises according to the number of cattle, number of family members, number of employees, and the size of the land used for production

Number of cattle in the enterprise	**Number of enterprise**	**Percentage (%)**
1-20	57	57
21-40	26	26
41-60	11	11
Over 60	6	6
Total	100	100
Number of Family Members	**Number of enterprise**	**Percentage (%)**
1-4	47	47
5-8	45	45
9-12	8	8
Total	100	100
Number of Employees in the Enterprise	**Number of enterprise**	**Percentage (%)**
1-4	80	80
5-8	20	20
Total	100	100
Land Owned by the Enterprise (ha)	**Number of enterprise**	**Percentage (%)**
0	12	12
10-50	16	16
50-100	30	30
100-150	18	18
151-200	9	9
200 >	15	15
Total	100	100

According to the surveys conducted in the enterprises; within the four groups created based on the number of cattle, 57% of the enterprises had 1-20 cattle, making it the largest group. The second largest group, with 21-40 cattle, accounted for 26% of the enterprises (Table 2). In a study by Güven (2021) analyzing the structural issues of cattle farms in Ardahan and Kars provinces, it was noted that 65.3% of the farm owners interviewed had 30 or fewer cattle. In the same study, the proportion of farm owners with 50 or more cattle was 13.4% (Güven, 2021). Another study conducted by Torgut et al. (2019) in İzmir stated that 52.2% of the farms were small enterprises based on the size of the dairy herd, with an average of 15.63 cattle in small enterprises, 41.19 cattle in medium-sized enterprises, and 115.55 cattle in large-scale enterprises. Additionally, Aydın Eryılmaz et al. (2020) stated that despite an increase in large-scale farms in Türkiye between 2013-2017, 77% of the farms had fewer than 10 cattle, while only 10% of the farms had a cattle capacity of over 20 cattles.

In this study, the number of family members, given in three groups in Table 2, shows that 1-4 family members make up 47% in the first place, and 5-8 family members follow with 45% in second place. In a survey conducted in the TRA 2 region provinces; Ağrı, Ardahan, Iğdır, and Kars, the number of family members in the households of producers was determined to be 6 (Güven and Yavuz, 2020). According to the Turkish Statistical Institute (TUIK, 2024) data, the average household size in Türkiye in 2023 is 3.14. The number of household members in the enterprises obtained from this study is in line with the TUIK data. The survey in the districts of Kastamonu showed that the number of people actively working in the enterprises is 1-4 persons, accounting for 80% (Table 2).

Table 3. Activities other than livestock farming, years of livestock farming experience, reasons for starting livestock farming

Enterprises Owner's Activity Other Than Livestock Farming	**Number of enterprise**	**Percentage (%)**
Agriculture	44	32
Retired	11	11
Public sector	6	6
Beekeeping	3	3
Other	36	24
Total	100	100
How Many Years Has Livestock Farming Been Practiced?	**Number of enterprise**	**Percentage (%)**
1-10	31	31
11-20	11	11
21-30	20	20
31-40	19	19
41-50	17	17
51>	2	2
Total	100	100
Reason for Starting Livestock Farming	**Number of enterprise**	**Percentage (%)**
Inherited from father	23	26.7
Additional income	10	11.6
Because it is profitable	4	4.6
Inherited from father and additional income	49	57
Total	86	100

At the scale of Kastamonu province, the enterprises were classified into six groups based on the size of the land used for cattle feed production. In these cattle farming enterprises, it was determined that the land area used for growing feed crops ranged from 50-100 decares, accounting for the highest percentage at 30%. Furthermore, in this study, the percentage of enterprises with 10-50 hectares of land is 16%, and the percentage of enterprises with 100-150 hectares of land is 18%. It was found that 12% of the enterprises surveyed do not produce any feed crops and entirely meet their needs through purchases (Table 2). In a study conducted on dairy cattle farming in Tokat province, the average farm size per enterprise was divided into three groups: 49.16 decares, 59.58 decares, and 81.81 decares. The general average size

was 59.72 decares. The land area used for planting feed crops in these enterprises was 14.55 decares (Öztürk and Karkacıer, 2008). In Türkiye, 35% of livestock enterprises have land sizes of 0-2 hectares, 28% have 5-20 hectares, and 5% have land sizes over 20 hectares. The average farm size is 5.9 hectares (Vural and Fidan, 2007).

In this study, it was found that the primary activity of farm owners outside of livestock farming is agriculture, with a percentage of 32%. In response to the question of how many years they have been engaged in livestock farming, 31% of the respondents indicated 1-10 years. This indicates that the number of people who started livestock farming in the last 10 years in Kastamonu province has increased, and especially those who have retired prefer livestock farming as an additional income source during their return to the village. As the reason for starting livestock farming, 57% stated that it was inherited from their father, while the primary reason for starting was to generate additional income (Table 3). In their studies, Aydın Eryılmaz et al. (2020) also mention that dairy cattle farming in Türkiye generally has a traditional structure, which is mainly inherited from the father.

In the livestock enterprise analysis study supported by the Expert Hands Project, it was found that two out of three individuals rely solely on livestock for their income. While specializing in livestock farming is a positive aspect for enterprises solely engaged in it, the need for additional income arises because these enterprises have both inputs and outputs throughout the year. Therefore, it is stated that income from sources other than livestock farming will be necessary (Satar et al., 2022). In another study conducted in Sakarya, it was found that 83% of the surveyed enterprises had been operating for more than five years, indicating that experienced farm owners were involved and that the level of trust was high (Tutar and Eryüzlü, 2015). In the present study, it is understood that 58% of the enterprise owners have been involved in livestock farming for more than 20 years, indicating that they possess considerable experience.

In Türkiye, cooperatives operating in the meat and meat products sector have a share of 0.54%, whereas in European countries, this ratio is significantly higher, ranging from 50% to 100%. Additionally, in Eastern Anatolia, it was stated that 80.4% of farmers were not members of any cooperative, 9% were members of the Agricultural Chamber, 5.8% were members of the Village Rural Development Cooperative, and 3.3% were members of the Agricultural Credit Cooperative (Aksoy and Yavuz, 2008). In this study, agricultural organizations showed that enterprises registered with the Agricultural Chamber were in the first place with 43.7%, followed by enterprises that were members of the Rural Development Cooperative Union at 20.2%, and membership in Agricultural Credit Cooperatives was at 15.1%. The membership rate of the Breeding Cattle Farmers Union was found to be 12.6%, and membership in the Sugar Beet Cooperative was 8.4%. The study found that each enterprise was a member of at least one cooperative (Table 4).

Table 4. Organizational status of the enterprise

Agricultural Organization Membership	Number of enterprise	Percentage (%)
Agricultural Chamber	52	43.7
Agricultural Credit Cooperative	18	15.1
Sugar Beet Cooperative	10	8.4
Breeding Cattle Farmers Union	15	12.6
Rural Development Cooperative Union	24	20.2
Total	119	100

In the enterprises subject to this study, the barn size was categorized into four groups. The proportion of enterprises with barn sizes of 20-50 m² is the highest, at 32% (Table 5). In a survey conducted in Kütahya, the length, width, and height of the barns were determined, and the area per cattle was calculated. The study found the average area per cattle to be 8.46 m² (Kılıç and Öziçsel, 2020). In another study, it was recommended that the space per cattle be between 5.5-6.5 m² or, under better conditions, 9-10 m² (Göncü et al., 2016). In this study, the highest proportion, 51%, of the barns had an area of 5-10 m² per cattle, followed by 10-50 m² living spaces with 25%, and 3-5 m² spaces with 22% (Table 5). The fact that 51% of the enterprises have a living space of 5-10 m² aligns with the 9-10 m² area width recommended by Göncü et al. (2016) when good conditions for cattle are present. Furthermore, the equipment found in the barns of the enterprises under this study includes automatic drinkers at 42.9%, feed crushing and mixing machines at 19%, and enterprises without any equipment at 22.9% (Table 5). In a study conducted by Ödevci and Karslı (2019) in the provinces of Çorum, Kırıkkale, and Kırşehir, it was noted that 31.8% of the enterprises had the necessary equipment for preparing feed rations, 12.1% did not have adequate equipment, and 56.1% had no equipment at all.

Özsağlıcak and Yanar (2022) stated that the use of bedding in barns is important for cattle welfare, and when bedding is not used on hard surfaces like concrete, cattle can suffer from injuries and other health problems. It is emphasized that cattle forced to lie on such hard surfaces are more likely to experience joint problems as the time they spend standing increases. For this reason, soft and dry bedding should be used to ensure cattle live a healthy life. In a study conducted in the central district of Erzincan province, it was found that bedding was used for cattle in 20.2% of the cattle enterprises, while 79.8% of them did not use bedding (Özsağlıcak and Yanar, 2021). In this study, it was determined that in the barns, 56.3% of the floors were concrete, 18.2% were stone, 15.5% were wood, and 10% were plastic bedding (Table 5). In terms of cattle health and welfare, it was observed that the enterprises within the

scope of this study did not have an appropriate infrastructure.

It was found that in the enterprises in this study, factory feed and concantrate feed were used at 29%, straw at 29.3% for cattle feeding (Table 6). Baş Hozman and Akçay (2016) state that there are difficulties in producing the high-quality straw needed for cattle feeding in our country, and that straw production and silage making are not at the desired level. They emphasized that the nutritional value of straw is low and is used primarily to provide satiety, and in many countries, straw is used as bedding (Baş Hozman and Akçay, 2016). In the study we conducted across Kastamonu province, it was also found that straw is mixed with factory feed and used as a primary nutrient.

Table 5. Structural characteristics of the enterprises

Barn Size (m^2)	**Number of enterprise**	**Percentage (%)**
20-50	32	32
51-150	24	24
151-300	22	22
Greater than 300	22	22
Total	100	100
Floor Materials of Barn	**Number of enterprise**	**Percentage (%)**
Concrete	62	56.3
Wood	17	15.5
Stone	20	18.2
Plastic Pad	11	10
Total	110	100
Space per Cattle in Barn (m^2)	**Number of enterprise**	**Percentage (%)**
3-5	22	22
5-10	51	51
10-50	25	25
50-100	1	1
100 >	1	1
Total	100	100
Tools and Equipment Used in Barn	**Number of enterprise**	**Percentage (%)**
Feed Mixing	2	1.9
Feed Crushing	14	13.3
Feed Crushing and Mixing	20	19
Automatic Waterer	45	42.9
No Equipment	24	22.9
Total	105	100

In the Giresun region, it was found that the rate of utilizing pastures and highlands for grazing was 86.3%, while only 13.7% of the enterprises did not utilize pastures for their cattle (Tuğay and Bakır, 2008). In this study, the rate of pasture use for cattle feeding was found to be quite high at 83%. The percentage of enterprises not using pastures for grazing was 17% (Table 6). Both studies were conducted in the Black Sea Region and show parallel results. Furthermore, in the Giresun study, 56% of the farmers produced straw themselves, while 33.5% purchased it from external sources (Tuğay and Bakır, 2008). In this study, 77.2% of the enterprises produced straw themselves, while 21.5% purchased it from other producers (Table 6). Due to the geographical location of the Western Black Sea region, it appears to have an advantage in straw production.

Table 6. Cattle feeding practices of enterprises

Type of Feed Used	**Number of Enterprises**	**Percentage (%)**
Factory Feed	97	29.04
Straw	98	29.34
Silage	42	12.6
Concentrate Feed	97	29.04
Total	334	100
Feed Supply Source		
Industrial Feed	**Number of Enterprises**	**Percentage (%)**
Private Distributor	65	84.4
Factory	1	1.2
Cooperative	11	14.3
Total	77	100
Straw	**Number of Enterprises**	**Percentage (%)**
Own Production	61	77.2
From Another Producer	17	21.5
Cooperative	1	1.3
Total	79	100
Reasons for Not Using Silage	**Number of Enterprises**	**Percentage (%)**
Insufficient Irrigation	11	25.6
Wild Boar Pressure	5	11.6
Does Not Know How to Make It	8	18.6
Insufficient Technical Conditions	3	6.9
Insufficient Financial Conditions	9	20.9
Insufficient Land	7	16.3
Total	43	100
Grazing Status	**Number of Enterprises**	**Percentage (%)**
Cattle going out to graze	83	83
Cattle not going out to graze	17	17
Total	100	100
Number of meals a day	**Number of Enterprises**	**Percentage (%)**
1 Meal	21	21
2 Meal	44	44
3 Meal	32	32
Constantly Available	3	3
Total	100	100

In this study, the utilisation of silage feed is observed to be at a lower rate of 12.6%. The reasons for non-utilisation of silage include insufficient irrigation (25.6%), inadequate financial conditions (20.9%), a lack of knowledge about its production (18.6%), insufficient land availability (16.3%), wild boar pressure (11.6%), and inadequate technical

conditions (6.9%) of the enterprises (Table 6). In a study conducted in the Hınıs district of Erzurum province, silage usage in cattle farming was found to be at a very low rate of 0.25% (Diler et al., 2016).

In the province of İzmir it was found that in 76-77% of the enterprises, straw was provided in two meals (Doğan and Kocaoğlu Güçlü, 2020). A study conducted by Önal and Özder (2008) in enterprises registered with the Breeding Cattle Producers Union in the province and districts of Edirne revealed that 63.2% of the enterprises fed cattle twice a day, while 31.6% fed them three times a day (Önal and Özder, 2008). In this study, it was found that 44% of the cattle were fed twice a day, 31% three times a day, and 21% were fed once a day (Table 6). A study conducted on dairy cattle, in which the animals were fed one, two, and four meals per day, concluded that as the number of meals increased, the time spent eating was more evenly distributed throughout the day, the number of trips to the feeder decreased, and it did not affect the cattles' lying down duration. Thus, access to food was positively affected (Arslan, 2009).

In this study, the milking process was carried out by machine in 68% and manually in 32%. In terms of milk processing, 80% was raw milk, and in addition, 11.2% of the enterprises produced yogurt, 4.8% produced cheese, and 4% produced butter. Milk was primarily sold to cooperatives at the highest rate of 34%. As illustrated in table 7, 24% of total was used to meet the enterprises' own need, while 21% was processed for sale in local markets (Table 7). In a study conducted in the province of Iğdır, it was reported that 98.8% of the milk was sold as raw milk, while 11.2% was processed into products. It was also reported that 81.3% of the raw milk was sold to collectors and 7.5% to dairies (Yılmaz et al., 2020).

In a study on the structural characteristics of dairy cattle enterprises in Elazig province, it was stated that the expectations of the enterprise owners from the government to develop and expand their enterprises include 43.5% for credit support, and 19.4% for the provision of breeding stock (Arslanoğlu, 2019). According to the surveys conducted in dairy cattle enterprises in the Aşkale district of Erzurum province, the expectations of the operators from the government include 24% for feed and medicine support, 16.7% for an increase in subsidies, 9% for reducing costs, 5.9% for the removal of breeding criteria, and 5.4% for barn construction support (Şat and Aydın, 2024). In this study, regarding the expectations of the operators, the highest percentage, 33%, is for low-interest loans, 23% for veterinary support, 11% for grants to producers, 9% for feed-fuel caretaker support, 8% for breeding stock support, 5% for information support, 4% for increasing incentives, 2% for unconditional grants to youth, and another 2% for no expectations at all (Table 8).

Table 7. Milk production and marketing characteristics of enterprises

Milking Method	**Number of Enterprises**	**Percentage (%)**
By Hand	32	32
By Machine	68	68
Total	100	100
Milk Processing	**Number of Enterprises**	**Percentage (%)**
Raw Milk	100	80
Cheese	6	4.8
Yogurt	14	11.2
Butter	5	4
Total	125	100
Places Where Milk is Sold	**Number of Enterprises**	**Percentage (%)**
Dairy	8	8
Company	13	13
Cooperative	34	34
Market	21	21
Own Use	24	24
Total	100	100

In the Narman district of Erzurum province it was found that 99% of the enterprises benefited from veterinary services, 64.7% received these services when diseases were observed, and 7.7% received regular veterinary services (Koçyiğit et al., 2018). In Muş province, almost all enterprises received veterinary services. 61.5% received services when a disease occurred, and 38.5% received regular services (Bakır and Kibar, 2019).

Table 8. Expectations of the entrepreneur from the government

Expectations	**Number of Enterprises**	**Percentage (%)**
Low-interest loans	33	33
Veterinary support	23	23
Information support	5	5
Increase in incentives	4	4
Grant support for producers	11	11
Timely provision of support	3	3
Breeding support	8	8
Feed-fuel-caregiver support	9	9
Grant support for youth	2	2
No expectations	2	2
Total	100	100

In this study conducted in Kastamonu province and its districts, 67.6% of the enterprises stated that they had all the vaccinations required by the Provincial Directorate of Agriculture. It was reported that artificial insemination was performed by veterinarians in 31.1%. Due to financial limitations, only 1.3% of the enterprises received regular veterinary services (Table 9). They mentioned that they only sought veterinary support when the cattle were very sick or during difficult births. In cases of simple diseases or

normal births, particularly experienced entrepreneurs stated that they intervened themselves.

Table 9. Cattle health

Veterinary Service	Number of Enterprises	Percentage (%)
Vaccination of Cattle (Provincial Directorate of Agriculture)	100	67.6
Veterinary Support (Artificial Insemination)	46	31.1
Regular Veterinary Service	2	1.3
Total	148	100

4. CONCLUSIONS

Analyzing the structural characteristics of cattle enterprises is of critical importance for increasing sustainability and productivity in the sector. Cattle enterprises are generally structured as small-scale family enterprises, and this situation leads to efficiency losses in production processes. The majority of cattle enterprises in Turkiye are not benefiting sufficiently from modern agricultural practices and technological developments. This situation increases production costs while simultaneously limiting cattle production capacity. Additionally, a large portion of the enterprises face difficulties in growth and competitiveness due to a lack of financial and technical infrastructure. However, in recent years, positive developments have been observed in the structural transformation of cattle enterprises, thanks to various government incentives, cooperative processes, and support from local authorities. Nonetheless, for this transformation process to be more effective and sustainable, the economic efficiency of enterprise structures needs to be analyzed more thoroughly.

As a result, based on the general status of cattle enterprises in Kastamonu province, it is observed that there are small family enterprises and the number of cattle breeders has increased over the past 10 years in order to generate additional income. Although the barns' capacities are suitable for cattle welfare, due to financial constraints in the barns, the use of bedding, which is important for cattle health, is not applied. The straw used in the enterprises is produced on the farmland, while factory-made feed is purchased. The milk produced on the farms is sold to cooperatives and local markets. Although veterinary services are not provided regularly, mandatory vaccinations conducted by the Provincial Directorate of Agriculture are applied in all enterprises. As for the enterprises' expectations from the government, there are requests for increased incentives such as low-interest loans and grants, support for feed, fuel, and caretaker costs, breeding support, as well as service support such as veterinary care and information.

Author Contributions

Özlem AYAN: (a) Idea, Concept, (b) Study Design, Methodology, (c) Literatur Review, (e) Material, Resource Supply, (f) Data Collection, Processing, (g) Analyses, (h) Writing Text

Naci TÜZEMEN: (a) Idea, Concept, (b) Study Design, Methodology, (d) Supervison, (i) Critical Review

Declaration of Ethical Code

In this study, we declare that all the rules stipulated within the scope of the "Directive on Scientific Research and Publication Ethics of Higher Education Institutions" have been adhered to, and none of the actions specified under the section titled "Violations of Scientific Research and Publication Ethics" of the mentioned directive have been committed.

Conflict of Interest

The authors declare that they have no conflict interests.

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