Structural analysis of cattle enterprises in Kayapınar district of Diyarbakır province

Muhittin TUTKUN[1] ID

[1] Dicle University Faculty of Agriculture Department of Animal Science, Diyarbakır, Türkiye

Available online at
https://dergipark.org.tr/jaefs
https://jaefs.com/

Abstract

This research was conducted in person in Diyarbakir province, Kayapınar district, by means of a questionnaire with a total of 120 people engaged in cattle breeding in 21 settlements. The questionnaire addresses the existence of cattle farms, the general structural status of cattle farms, information provided by owners, feed supply and feeding practices, animal health and treatment practices, reproduction and artificial insemination practices, production and marketing of animal products on farms, housing status and support utilization status. It has been shown that the farms are small farms and 92% of the farms have closed barns. The fact that the majority of farm owners are between 40 and 61 years old can be seen as a danger signal for livestock. It was found that there is no cooperative in the villages except Cumhuriyet district, which brings the problem of marketing raw milk and dairy products. In the study area, it it has been observed that activities such as animal care feeding, estrus monitoring and application, and automation in animal husbandry are insufficient. For sustainable animal production, relevant public institutions and organizations need to work more intensively and carry out training, monitoring and evaluation activities to increase productivity per animal in enterprises, to train operators on herd management, care and feeding and animal health, and to meet expectations by solving problems in enterprises. This research provides us with important data about the general structure of cattle breeding in Kayapınar district of Diyarbakır province.

Keywords: Cattle enterprises, Diyarbakır, Kayapınar, structural analysis

INTRODUCTION

Animal husbandry has always been of great social and economic importance in Turkey and has great potential for animal production due to its geographical and socio-economic conditions. Despite this potential, animal husbandry generally takes place as a secondary activity alongside crop production (Yılmaz and Koeknaroğlu, 2007; Baş Hozman and Akçay, 2016; Kösemen and Şeker, 2016).

Dairy cattle are the most important source of milk production. There is no short-term planning flexibility in dairy cattle activities due to reasons such as being a long-term production branch among livestock activities and the difficulty of converting the investments made into other investments (Şahin, 2001).

The importance of dairy farming in Diyarbakır extends to both social and economic aspects, contributing significantly to the livelihoods of the local population and the regional economy. Dairy farming is a major economic activity in Diyarbakır, providing income and employment opportunities for many individuals and families. The dairy sector contributes to the overall agricultural

economy of the region, generating revenue through the sale of milk and dairy products including milk, cheese, and yogurt, are essential components of the local diet, contributing to the food security and nutritional needs of the community.

Dairy farming is typically associated with rural areas, and its presence in Diyarbakır contributes to the overall development of rural communities. It helps sustain rural economies and prevents migration from rural to urban areas.

In Turkey, by the year 2022, there are a total of 16,8 m head of cattle consisting of 49% pure breed, 43% crossbreeds and 8% local breeds. According to TUIK data, cattle milk production in our country was 21.4 million tons in 2021. As a result of the studies on breeding, developments in animal nutrition and management have increased the carcass weight, which was 143 kg/head in 1991, to 285 kg/head in 2021. (TUIK, 2022)

Table 1. Number of Cattle and Buffalo in Türkiye, Diyarbakir and Kayapınar District

Species	Türkiye	Diyarbakır	Kayapınar
Cattle	17.692.655	559.883	24.063
Buffalo	182.717	17.195	489

Source: Türkvet, 2022

When the number of animals and milk production amounts according to the species are examined in Turkey; Approximately 35% of the existing cattle are milked and 90.5% of the milk produced is obtained from cattle. In general, dairy cattle enterprises in Turkey are seen as small family enterprises. When the studies on dairy cattle breeding are examined, it is seen that the high costs of the enterprises, the problem of feed production and supply, technical problems, and the problems encountered in marketing come to the fore. There are significant differences between regions in terms of cattle breeding in Turkey. Although there are studies in the literature that examine the characteristics of dairy farms in different provinces, it is considered important to repeat the studies, observe the changes in the farms and develop solutions to their problems.

This study aims to reveal the general structure of the cattle farms in the Kayapınar District of Diyarbakır province and offer suggestions for its solution.

Understanding the multifaceted importance of dairy farming in Diyarbakır is crucial for policymakers, researchers, and stakeholders to develop strategies that enhance the sector's sustainability, address challenges faced by farmers, and promote the overall well-being of the community.

Materials and Method

The study material was sourced from cattle enterprises situated in the Kayapınar district of Diyarbakır province through in-person questionnaire interviews.
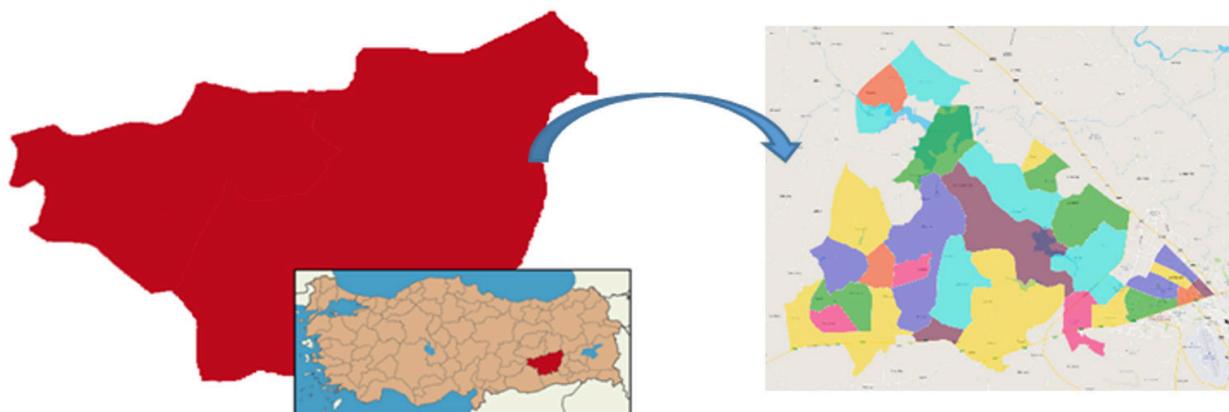

Figure 1. Study area location map

In the official Animal Recording and Data System (Türkvet) of the Ministry of Agriculture and Forestry in Kayapınar district, it has been determined that there are a total of 933 active holdings and 22144 cattle in 2022.

In this population size, the number of samples to be taken for a study to be carried out with 10% sampling error and 95% confidence level was calculated as 120 enterprises using the formula given below (Yazıcıoğlu and Erdoğan, 2004).

$$n = N.t^2.p.q / d^2(N-1) + t^2.p.q$$

n : Sample size
N : Population size (453)
t : t scale value at 95% confidence interval (1.96)
p : 0.5 (50% incidence)
q : 0.5 (50% incidence)
d : Sampling error (0.10)

Population Size (N)

The total number of active holdings and cattle in the Kayapınar district, as recorded in the official Animal Recording and Data System (Türkvet), is identified as the population size. In this case, N is 22144 cattle distributed among 933 active holdings.

Confidence Level (95%)

The confidence level represents the likelihood that the true population parameter falls within the calculated confidence interval. A 95% confidence level is commonly used in statistical studies, and it corresponds to a t scale value of 1.96. This value is derived from statistical tables and represents the standard deviation multiplier for a normal distribution.

Sampling Error (10%)

The sampling error, denoted as 'd,' signifies the acceptable margin of error in the estimate of the population parameter. In this study, a 10% sampling error is specified, meaning that the researchers aim for the estimated value to be within 10% of the true population parameter.

Incidence (p and q)

The incidence, represented by 'p' and 'q,' refers to the proportion of the population exhibiting the characteristic of interest. In this case, since the incidence is not explicitly known, it is assumed to be 50%, resulting in p = q = 0.5. This assumption is conservative and results in the maximum required sample size for a given confidence level and sampling error.

The primary data source for this research emanates from in-depth, face-to-face surveys conducted with 120 enterprise owners. The surveys were administered across 21 villages within the Kayapınar District of Diyarbakır during the months of July and August in 2023. The study focuses on breeders residing in the selected villages, forming the core basis of the research data.

The face-to-face survey approach ensures a direct and personalized interaction with enterprise owners, allowing for a comprehensive understanding of their perspectives and experiences in the dairy farming sector. The choice of villages and the sampling process provide a representative cross-section of the local community involved in dairy farming, contributing to the robustness and reliability of the research findings.

The data collected through the questionnaire were entered into the Excel program after the necessary coding and controls were made. While evaluating the data, simple averages and percentage calculations were used. A questionnaire was prepared to determine the general characteristics and practises in enterprises. The answers given by the business owners during the visits were recorded by entering this survey form, and the details about the business were noted by making observations during the visit. The statistical analysis of the data obtained from the research results was conducted using the SPSS 15.0 software package, employing frequency analysis

RESULTS AND DISCUSSION

Socio-Demographic Characteristics of Households

According to the study, 3.3% of cattle enterprises owners age are 18-30 years old, 9.16% are 31-40 years old, 79.1% are 41-60 years old and 8.3% are 61 years old (Figure 2).

The findings from the data reveal a notable demographic trend in livestock activities in the province, indicating a predominant involvement of middle-aged individuals. The aging trend observed over the years is particularly evident in the concentration of livestock activity owners within the 41-60 age range. This demographic shift aligns with similar studies conducted in different regions. For instance, Kaygısız and Özkan (2021) study in the Tekkeköy district of Samsun province reported that 62.50% of breeders fell within the 40-60 age range. Similarly, Özdemir et al. (2021)

found an average age of 43.56 years among breeders in the Balıkesir Gönen district. Tutkun et al. (2017) study in Diyarbakır Province reported a 48% ratio of breeders aged 41-60. In a study conducted in the Viranşehir district, it was determined that the average age of breeders is 41.9 years (Delebe and Yazgan, 2023). In another study conducted in Iğdır province, it was also determined that the average age of breeders is 44.9 (Yılmaz et al. 2020).
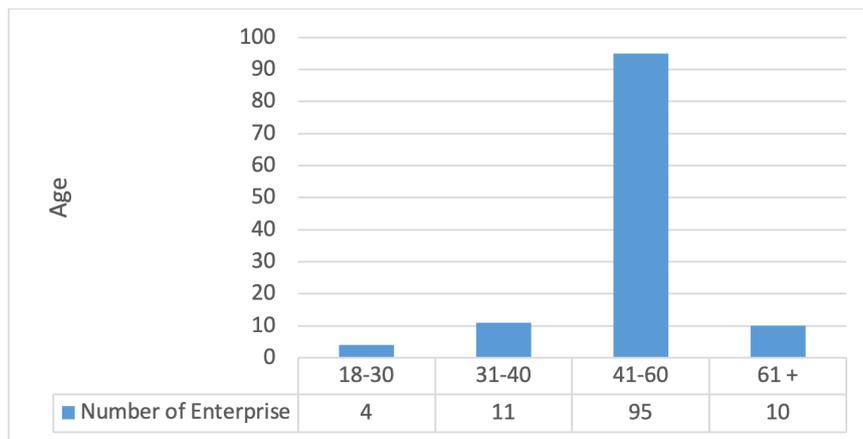

Figure 2. Distribution of breeders by age

Remarkably, in the current study, the age distribution stands at approximately 79.1%, indicating a substantial increase when compared to a previous study in the same province. This suggests a significant shift in the age composition of individuals engaged in livestock activities, with the breeder's age ratio nearly doubling.

A noteworthy concern is the limited involvement of youth in animal production, with only 3.3% falling within the 18-30 age range. This may have implications for the sustainability and succession of livestock activities in the long term.

It has been observed that, similar to other regions in Turkey, individuals engaged in cattle farming are mostly in the middle age group, and there is less interest from the younger population in cattle farming.

Additionally, literacy rates among breeders in animal husbandry present a diverse picture, with 42% being illiterate, 20% completing primary school, 24% secondary school, and 11% reaching high school. When the education levels of dairy farming business owners are evaluated according to scales, it is determined that, for small enterprises, approximately 49.1% are primary school graduates, for medium-sized enterprises, around 45.4% have primary school education, and for large enterprises, approximately 5.5% are primary school graduates. Across all scales, it is reported that high school graduates, with 49.6%, constitute the numerical majority (Mat &Cevger, 2020).

These findings underscore the importance of considering both demographic and educational factors in shaping future policies and interventions aimed at sustaining and advancing animal husbandry practices in the region (Figure 3).
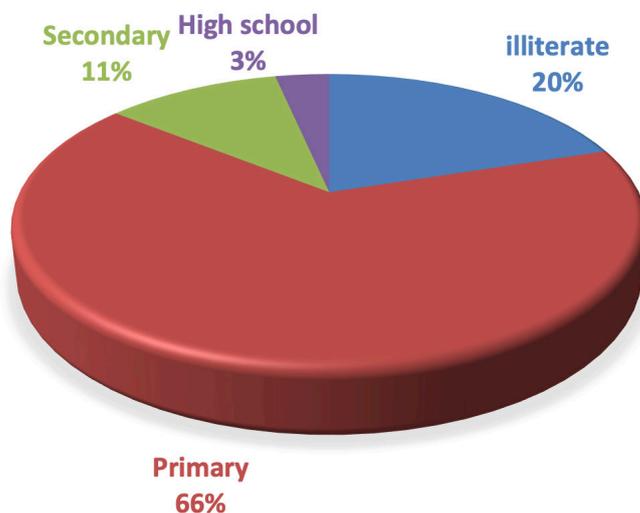

Figure 3. Literacy rate of enterprice owners

It has been determined that as the literacy rate increases, the number of people engaged in animal husbandry decreases.

Animal presence of enterprises

The study encompasses enterprises with a total of 2987 cattle distributed across various age groups.There are a total of 1541 (51,5%) cows, 517 (17,3%) heifers, 505 (16,9%) bullock, 412 (13,8%) calves and 12 (0,4%) bulls in the holdings (Figure 4).
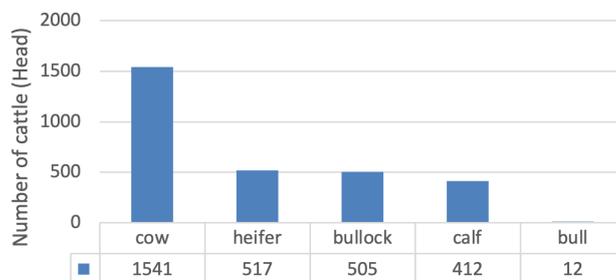

Figure 4. The animal presence

According to the research findings, 60% of the cattle are cross-breed, 23% are pure breeds and 17% are local breeds (Figure 5). Most farms enterprises prefer crossbred cattle due to insufficient barn and maintenance-feeding conditions. In a study conducted by Bakan and Aydın (2016) in Ağrı the province, they found the local breed rate is 11.6%. Tugay and Bakır (2008) found pure, cross-breed and local breeds as 5.3%, 23.6% and 71.1%, respectively in Giresun province.

In the study conducted in Balikesir Province, it was observed that 87.1% of the enterprises within the research scope preferred dairy breeds, while 12.9% opted for dual-purpose breeds (Mat & Cevger). A study conducted in Kahramanmaraş revealed that 61.79% preferred dairy breeds and 38.21% preferred dual-purpose breeds. Similarly, in a research study in the Thrace region, the preference was 80% for dairy breeds and 20% for mixed breeds (Güzel and Aybek, 2017; Keskin and Dellal, 2011). Regarding producers, it is believed that dairy cultural breeds have a superior breeding value, milk yield, and ease of calving compared to mixed breeds. On the other hand, mixed-breed animals are considered to have higher values in terms of slaughter value, economic lifespan, and lactation duration (Topçu, 2008).
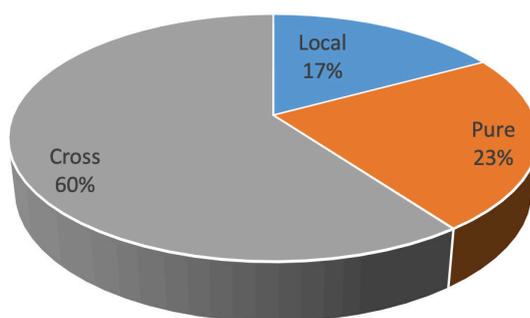

Figure 5. Cattle breed distributions

Cattle barns types

In this study, data was gathered through face-to-face surveys involving 120 enterprise owners. The distribution of barn types within these enterprises revealed that 91.6% were closed, 5.0% were semi-open, and 3.4% were open (Figure 6). A comparative analysis with a study conducted by Yılmaz et al (2020) in Iğdır province indicates notable differences. In the Iğdır study, 88.3% of barns were closed, with 8.0% being semi-open and 3.7% open. The findings from the current research surpass these percentages, signifying a higher prevalence of closed barns, semi-open barns, and open barns.

When examining some studies conducted in different provinces, it has been reported that existing businesses in Kayseri province prefer tied-stall barn types, with 75.0% (Şahin, 2009), in Çankırı province, 73.9% (Yıldız, 2013), in Sakarya province's Hendek district, 43.8% (Karaca, 2020), and in Austria, 40.2% of the businesses prefer tied-stall barn types (Klein-Jobstl et al., 2015).

Furthermore, when juxtaposed with the study by Özsağlıcak and Yanar (2022), which focused on cattle enterprises, a distinct pattern emerges. In the present study, 95.0% of cattle enterprises reported closed barns, while 4.8% and 0.3% had semi-open and open barns, respectively. This variation in barn types among cattle enterprises highlights the nuanced preferences and practices within different regions or populations. The results suggest a higher inclination towards closed barns in the current investigation compared to the findings of Özsağlıcak and Yanar's study. These disparities could be attributed to various factors, including geographical, climatic, or management differences that influence the choices of barn types among livestock owners.
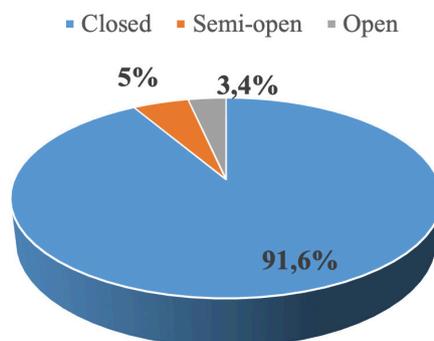

Figure 6. Barn types

Demir et al. (2014) in a study conducted in Kars province, 95.1% of the barns are closed and 4.9% are semi-open barns and 83.1% of closed barns The vast majority of them are of fixed-attached barn type. In another study, % 97 of barns are closed and 3% are open (Kaygısız and Tümer, 2009) while Yaylak et al. (2015), in their study in Ödemiş district of İzmir province, 8.7% of the barns were closed, 15.2% semi-closed and 76.1% were open

Cattle barn capacity

The average capacity of the barns was determined as 28 cattle. In the study, barn capacities vary, 6% of the enterprises have a capacity of 1-5, 14% of 6-10, 42% of 11-20 and 18% of 21-50, and barns with a capacity of 51 and more was not observed (Figure 7).
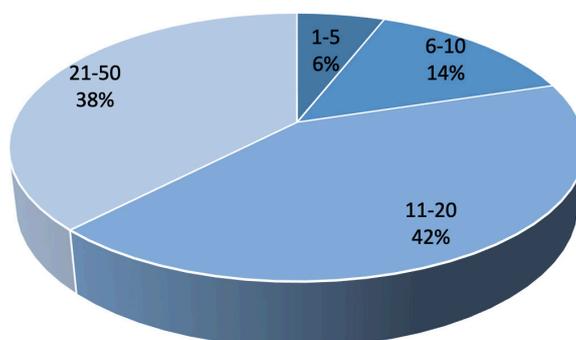

Figure 7. Barn capacity of the owners

The majority of enterprises opt for stone in constructing barn walls, concrete for barn floors, sheet metal for barn roofs, and wood for feeders. According to a report by Kaygısız and Tümer in 2009, briquettes are employed as a heating source in 40.0% of the existing cattle barns in Kahramanmaraş province.

In a separate study conducted by Mundan et al. in 2018 in Şanlıurfa province, it was documented that the wall-building material 69.7% briquette, 11.9% stone and 18.4% bricks were used. It has been determined that it is the most common occurrence in cattle barns in Giresun province, the stone material at 62.5%, then briquette at 27.9%, wood at 8.6% and adobe at 1.1% (Tugay and Bakır, 2006).

Differences between regions, climatic, and economic levels and growers' differences between provinces occurred due to preferences and habits arising from socio-demographic differences.

Animal feeding

For economical and rational animal feeding, it is necessary to take into account the genetic characteristics of the animals as well as their productivity, physiological state (pregnancy), health status and environmental conditions.

Within the scope of the research, it was found that 22% of the examined existing enterprises did not provide animal feed based on different ages and genders. Animal feeding was implemented with the same content and amount while 41% of the businesses stated that grouped and 37% stated that they partially implemented (Figure 8)
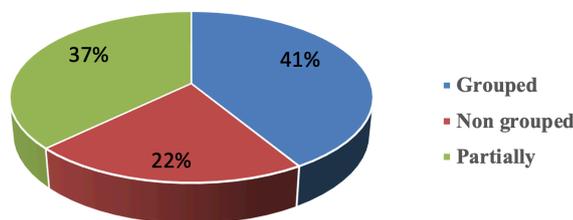

Figure. 8. Animal feeding methods

In the study, animal feeding practises was presented in Figure 9. In the research, 43.3% of the enterprises stated that they procured by purchasing the roughage, 22.5% of them by groving and rest of them 34.1% declared that they both by growing and puchasing to meet requirments of the enterprises

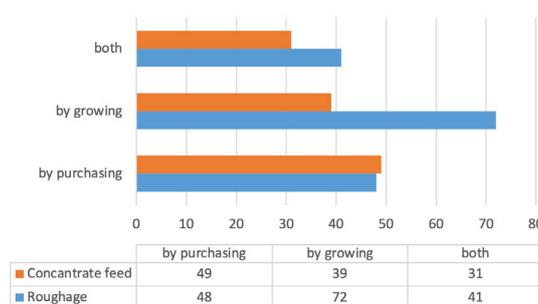|	by purchasing	by growing	both
Concantrate feed	49	39	31
Roughage	48	72	41

Figure 9. Concentrate and roughage procure situations of the enterprises

It was found that 41% of the enterprises acquired concentrated feed through a dealer, 33% fed their animals with the grains they grew, and 26% of both by purchasing and growing. The most important problem of farms is the high forage and concentrate feed prices.

They stated that most of the existing enterprises visited within the scope of the research had difficulties in supplying feed. It has been observed that the enterprises which stated that they did not have difficulties in supplying feed, also carried out plant production activities and used products such as wheat, barley, corn straw and straw obtained from them as animal feed.

In addition, the rate of growing forage crops and silage corn in farms is also low. It was observed that 40% of the breeders within the scope of the research used silage in animal feeding, while 60% did not use silage and did not even know what silage was.

Reproduction

Reproduction is considered the basis of animal breeding and is an indispensable condition for continuity in animal production. The main goal in dairy cattle enterprises is to obtain one offspring per year from each cow. Necessary conditions must be created for healthy reproduction to occur in enterprises. For healthy reproduction and fertility, animals must be fed well and balanced, preventive medical measures must be taken, and shelter and care conditions must be improved. In addition to the factors listed above, for healthy reproduction and successful fertility in cattle farms, it is of great importance to follow the estrus cycle of the animals well and perform timely breeding or artificial insemination. Within the scope of our research, the most common reproductive problems in enterprises, as well as estrus monitoring and breeding methods used (natural and artificial insemination) were examined. In the research, it was determined that 69% of the breeders observe estrus (heat) and 31% did not (Figure 10).

When the study examined which method breeders preferred in Insemination, It was determined that while almost all of the enterprises (94%) preferred natural insemination by using sire instead of artificial insemination, 6% of the enterprises applied the artificial method only (Figure 11).

In a study conducted in Giresun province by Tugay and Bakır (2011) reported that 38.9% of the enterprises performed artificial insemination and 58.2% performed natural insemination. The rate obtained in this study was found to be

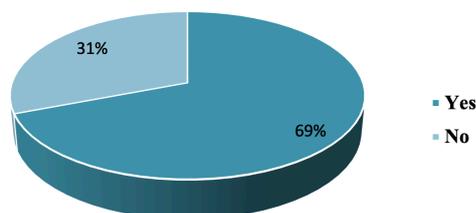higher than performing artificial insemination.
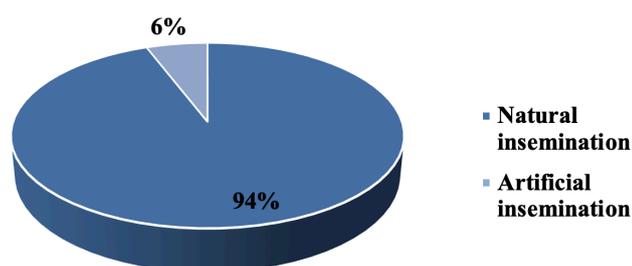

Figure 10. Estrus observation

Figure 11. Insemination methods used by breeders

In the study, the answers given by the breeders within the scope of the research regarding the time intervals in which they inseminated the cows after they came into heat. Accordingly, 46% of the breeders declared that they had it done in the first 0-4 hours after the heat was observed, 40% of them after 5-10 hours and the rest of 14% was 11-18 hours (Figure 12). Traditionally, the optimal timing for artificial insemination (AI) in cattle has been conventionally linked to the onset of estrus, occurring within 6 to 24 hours from the initial signs of estrus. Nevertheless, recent research indicates a shift in this interval, proposing that AI should be conducted within 16 to 6 hours before ovulation, thereby aligning it more closely with the conclusion of the estrus period.
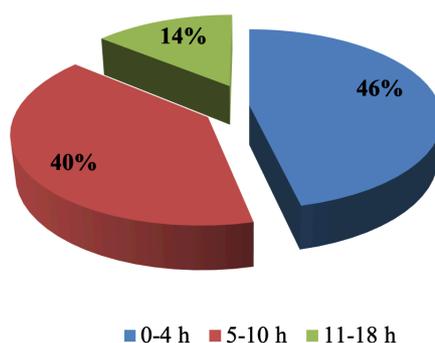

Figure 12. İnsemination timing

Milking

In cattle farms, ensuring the health of udders and maintaining hygiene during the milking process are crucial factors influencing the quality and dependability of the obtained milk. The way and conditions of storage of milk after milking are other important factors regarding the safety of milk. It has been determined that milking is generally done twice a day (99%) in farms, in the morning and evening, and in a very small number of farms (1%) in large capacity modern enterprises milking is done 3 times a day (Figure 13)

Cows are typically subjected to two milking sessions per day, although the frequency may vary based on the farmer's management strategy. The most prevalent approach involves milking at least twice a day, ensuring the comfort of the cows as their udders have a limited capacity to hold milk before requiring expulsion.

It has been found in a study conducted in Erzincan by Sağalcık and Yanar (2022) that The rate of enterprises where

milking is done once a day is 1.4% and done twice is 98.6%

It was determined that 86% of the milking was done by hand and 14% of the milking was done by machine in a village where there was only a cooperative (Figure 14). Aksoy et al. (2014), in a study conducted in Erzurum province, found the rate of enterprises milking by hand as 88.7%. Koçyiğit et al. (2016) found that 85% of milking by hand in a study conducted in Hınıs district of Erzurum province.

In a study conducted in Erzincan province, it was reported that in 47.4% of the enterprises, milking is done manually, in 47.1%, mobile milking machines are used, and in 5.5%, milking is carried out in milking units (Özsağlıcak & Yanar, 2022).

A study conducted in the Tekkeköy district of Samsun province, ıt was found that in 31% of the enterprises, milking is done manually and in 69% of made by milking machines (Kaygısız and Özkan,2021)
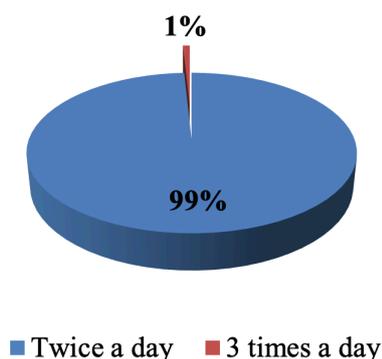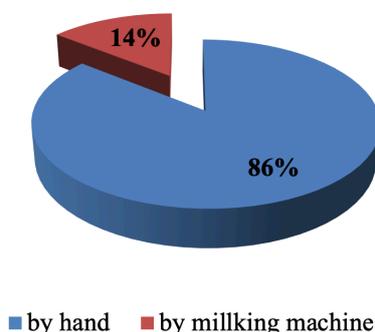

Figure 13. Milking time

Figure 14. Milking methods

Within the scope of the research, 90% of the breeders pay attention to milking hygiene including the pre- and post milking routines as well as the cleanliness of the equipment used to milk the cows. Premilking procedures such as dipping, dry wiping, fore stripping, and cleaning or drying of the teats and teat ends.

Within the surveyed enterprises, the study revealed that 47.4% employed manual milking techniques, 47.1% utilized mobile milking machines, and 5.5% conducted milking in designated milking parlors. Furthermore, a significant 94.1% of breeders practiced udder cleaning and disinfection both before and after the milking process. Notably, the research found that only 47.7% of the enterprises underwent regular checks for mastitis. (Özsağlıcak and Yanar,2022)

Marketing

A small proportion of this milk (1%) was marketed as raw milk only and the rest of the milk in the enterprises was sold after processing into different products such as 48% yoghurt, 45% cheese, and 6% butter (Figure 15).

In the Giresun region, dairy farming businesses evaluate their milk as butter, yogurt, cheese, raw milk, and curd, as reported by Tugay (2007). In another study conducted in Ağrı province, 15.1% of the operators reported selling their produced milk to milk collectors, 2.8% to dairies, and 82.1% reported using it in other ways (for household needs, selling to interested parties, etc.) Bakan (2014).
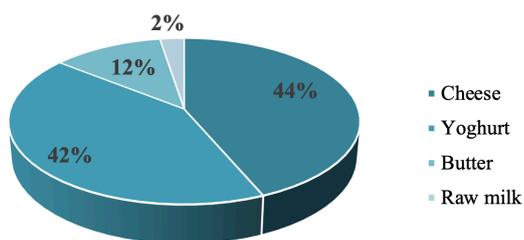
Figure 15. Raw milk marketing methods of the enterprises

Animal Health and Veterinary services

The study outcomes indicate that nearly all enterprises (99.2%) prioritize protective vaccination. Veterinary services are sought by a substantial 90.9% of the enterprises, with 70.4% seeking veterinary care only when a disease is observed, and 29.6% opting for regular veterinary check-ups. Common animal diseases seen were declared as brucellosis, mastitis, foot and mouth disease (FMT), theileria and septicemia (Figure 16). A study conducted by Bakır and Kibar (2019) in Muş province, determined the incidence of mastitis (64.7%) in cows raised in enterprises is higher than in this study (5,8%).
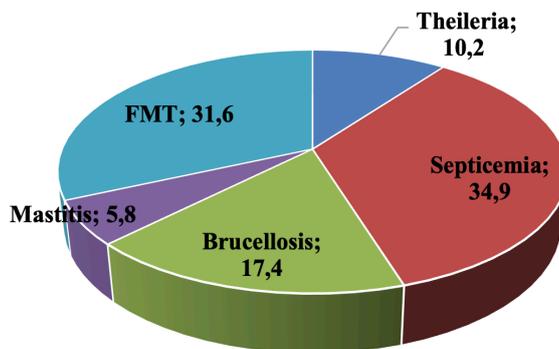

Figure 16. The most common animal diseases

One of the most effective health protection methods for animals is vaccination. Vaccinating on time and correctly can minimize the risk of disease in animals. The quality of the vaccines used, cold chain application, the vaccination schedule and the method of administering are important factors affecting the disease-preventive effectiveness of the vaccine. It has been determined that failure to vaccinate on time causes widespread epidemic diseases, especially FMD, and serious economic losses.

CONCLUSION

The majority of the cattle farms under investigation are small enterprises. This situation means that they cannot specialize in animal production and prevents them from increasing production. As far as animal diseases are concerned, foot and mouth disease and mastitis are particularly prevalent in the district. It was found that vaccinations and other health protection measures are not effectively implemented on the farms. Cattle farms in Diyarbakır suffer from high input costs for production. It was determined that the type of organization in the cooperative structure is not very common in cattle farms and there is only one cooperative in the district. For sustainable livestock production, the relevant public institutions and organizations need to work more intensively and carry out training, monitoring and evaluation activities to increase productivity per animal on farms, train operators in herd management.

To ensure sustainable animal production in the Kayapınar district, it is imperative for relevant public institutions and organizations to intensify their efforts. This involves conducting comprehensive training, monitoring, and evaluation activities aimed at increasing productivity per animal. Operator training on herd management, care, feeding, and animal health is essential. Addressing existing challenges within enterprises will contribute to meeting expectations and fostering a more sustainable and efficient cattle breeding sector in the region. Overall, this research serves as a valuable resource, providing essential data for understanding and addressing the general structure of cattle breeding in the Kayapınar district of Diyarbakır province.

REFERENCES

Aksoy, A., Güler, İ.O. & Terin, M. (2014). Erzurum ili damızlık sığır yetiştiricileri birliğine üye olan ve olmayan üreticilerin belirli özellikler açısından karşılaştırılması. GOP Ziraat Fakültesi Dergisi. 31(3), 82-90

Bakan, Ö. & Aydın, R. (2016). Ağrı İli Süt Sığırcılığı İşletmelerinin Sosyo-Ekonomik Özellikleri. Ziraat Fakültesi Dergisi, 47(2),113-122.

Bakan, Ö. (2014).Ağrı ili süt sığırcılığı işletmelerinin yapısal özellikleri. Yüksek Lisans Tezi, Atatürk Üniversitesi Fen Bilimleri Enstitüsü, Erzurum, 2014

Bakır, G. & Kibar, M. (2019). Muş İlinde Süt Sığırcılığı İşletmelerinde Sağlık Yönetiminin Belirlenmesi. Iğdır Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 9(4), 2409-2419, https://doi.org/10.21597/jist.533230

Baş, Hozman, S. & Akçay, H. (2016). Sivas İli Damızlık Sığır Yetiştiricileri Birliğine Üye Süt Sığırcılığı İşletmelerinin Bazı Teknik ve Ekonomik Özellikleri. Tarım Ekonomisi Dergisi, 22(1), 57-65.

Delebe, Ç. & Yazgan, K. (2023). Viranşehir İlçesindeki Süt Sığırı İşletmelerin Kimi Yapısal Özelliklerinin Süt Verimine Etkisi. Tekirdağ Ziraat Fakültesi Dergisi, 20(2), 441-451. https://doi.org/10.33462/jotaf.1223936

Demir, P., Adıgüzel, S.I., Sarı, M. & Ayvazoğlu, C. (2014). Kars merkez ilçedeki süt sığırcılık işletmelerinin genel yapısı ve ekonomik boyutu. F.Ü. Sağlık Bil. Vet. Dergisi 281: 9-13.

Güzel, M.& Aybek, A. (2017). Kahramanmaraş ili süt sığırcılığı işletmelerinin mekanizasyon yapısı. KSÜ Doğa Bil Derg, 20, 148-159

Karaca, M. (2020). Hendek ilçesi süt sığırcılığı işletmelerinde buzağılarda yaşama gücü ile ilgili yönetsel uygulamalar. Bursa Uludağ Üniversitesi Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi (Basılmış).

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

Kaygısız, A. & R. Tümer. (2009). Kahramanmaraş ili süt sığırı işletmelerinin yapısal özellikleri: 2. Barınak özellikleri. Kahramanmaraş Sütçü İmam Univ. Doğa Bilim. Derg., 121:40-47.

Keskin, G& Dellal, İ. (2011). Trakya bölgesinde süt sığırcılığı üretim faaliyetinde brüt kar analizi. Kafkas Üniv Vet Fak Derg, 17, 177-182.

Klein-Jobstl D, Arnholdt, T., Sturmlechner, F. Iwersen, M. Drillich, M. (2015). Results of an online questionnaire to survey calf management practices on dairy cattle breeding farms in Austria and to estimate differences in disease incidences depending on farm structure and management practices. Acta Veterinaria Scandinavica, 57(44): 1-10. https://doi.org/10.1186/s13028-015-0134-y

Koçyiğit, R., Diler, A., Yanar, M., Güler, O., Aydın, R., & Avcı, M. (2015). Erzurum İli Hınıs İlçesi sığırcılık işletmelerinin yapısal durumu, Çiftlik yönetimi ve buzağı yetiştirme uygulamaları. Iğdır Üniv. Fen Bilimleri Enstitüsü Dergisi, 5(4), 85-97.

Köseman, A. & Şeker, İ. (2016). Malatya İlinde Sığırcılık İşletmelerinin Mevcut Durumu, I.Yapısal Özellikler. Fırat Üniversitesi Sağlık Bilimleri Veteriner Dergisi, 30(1), 5-12.

Maç, H. (2013). Yem Bitkileri Üretim Desteği Politikasının Değerlendirilmesi, Konya İli Ereğli İlçesi Örneği. Yayımlanmamış Yüksek Lisans Tezi, Süleyman Demirel Üniversitesi Fen Bilimleri Enstitüsü, Isparta.

Mat, B. & Cevger, Y. (2020). Structural characteristics and problems of dairy farms in Balıkesir province Eurasian J Vet Sci, 2020, 36, 4, 277-286 https://doi.org/10.15312/EurasianJVetSci.2020.309.

Şahin, K. (2001). Kayseri İlinde Süt Sığırcılığı Yapan İşletmelerin Yapısal Özellikleri ve Pazarlama Sorunları. YYÜ Tarım Bilimleri Dergisi,

11(1),79-86.

Özdemir, Y., Kınıklı, F. & Engindeniz, S. (2021). Süt Sığırcılığı İşletmelerinin Yapısal Özellikleri ve Sorunları Üzerine Bir Araştırma, Balıkesir'in Gönen İlçesi Örneği , 8 (4), 1001 – 1011. https://doi.org/10.30910/turkjans.938077

Özsağlıcak, S. & Yanar, M. (2022). Erzincan İli Merkez İlçesi Sığırcılık İşletmelerinde Barınakların Yapısal Özellikleri ve İşletmecilerin Öğrenim Durumlarıyla İlişkileri Anadolu, J. of Aari 32 (1): 62-75. https://doi.org/10.18615/anadolu.1130026

Şahin, S. (2009). Kayseri il merkezi süt sığırı barınaklarının yapısal özellikleri. Selçuk Üniversitesi Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi (Basılmış).

Topçu Y, 2008. Süt sığırcılığı işletmelerinde başarıyı etkileyen faktörlerin analizi: Erzurum ili örneği. OMÜ Zir Fak Dergisi, 23, 17-24.

Tugay, A. & Bakır, G. (2008). Giresun yöresindeki sığırcılık işletmelerinde kullanılan yem çeşitleri ve hayvan besleme alışkanlıkları. Atatürk Üniv. Ziraat Fakültesi Dergisi,39(2), 231-239.

Tugay, A. (2007).Giresun yöresindeki süt sığırcılığı işletmelerinin yapısal özellikleri. Yüksek Lisans Tezi, Yüzüncü Yıl Üniversitesi Fen Bilimleri Enstitüsü, Van.

Tutkun, M., Denli, M., & Sessiz, A. (2017). Diyarbakır İli Süt Sığırcılığı İşletmelerinin Yapısal Durum Analizi. Türk Tarım –Gıda Bilim veTeknoloji Dergisi,5(5),476-483.https://doi.org/10.24925/turjaf.v5i5.476-483.933

Yaylak, E., Y. Konca & N. Koyubenbe. (2015). İzmir ili Ödemiş ilçesinde damızlık sığır yetiştiricileri birliği üyesi işletmelerde sığırların barındırılması. TURJAF 3(35):316-324.

Yazıcıoğlu, E. & Erdoğan, S. (2004). SPSS Uygulamalı Bilimsel Araştırma Yöntemleri. Detay Anatolia Akademik Yayıncılık, 1. Baskı, Ankara.

Yıldız B, 2013. Çankırı ili süt sığırı barınaklarının yapısal özellikleri ve yeni barınak modellerinin geliştirilmesi. Selçuk Üniversitesi Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi (Basılmış)

Yılmaz, H. & Köknaroğlu, H. (2007). Avrupa Birliği Ortak Tarım Politikasına Uyum Sürecinde Türkiye'de İzlenen Hayvancılık Politikalarının Değerlendirilmesi. V. Zootekni Bilim Kongresi, 5-8 Eylül, 2007, Van.

Yılmaz, İ., Kaylan, V. & Yanar, M. (2020). Iğdır İli Büyükbaş Hayvan Yetiştiriciliğinin Yapısal Analizi. Iğdır Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 10(1), 684-693. https://doi.org/10.21597/jist.567366