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NİĞDE ÖMER HALİSDEMİR UNIVERSITY

GRADUATE SCHOOL OF AND NATURAL AND APPLIED SCIENCES

DEPARTMENT OF ANIMAL PRODUCTION AND TECHNOLOGIES



ECONOMIC ANALYSIS OF DAIRY CATTLE BREEDING ENTERPRISES
REGISTERED WITH THE BREEDING CATTLE BREEDERS ASSOCIATION OF
NİĞDE PROVINCE

ÖZGE NUR FİDAN

DECEMBER 2024

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Master Thessis

Supervisor

Asst. Prof. Dr Sema YAMAN FIRINCIOĞLU

DECEMBER 2024

The study titled “**Economic Analysis of Dairy Cattle Breeding Enterprises Registered With The Breeding Cattle Breeders Association of Niğde Province**” and presented by **Özge Nur FİDAN** with the help of supervisor **Asst. Prof. Sema YAMAN FIRINCIOĞLU**, has been found as Master thesis by the jury at Department of Animal Production and Technologies of Niğde Ömer Halisdemir University Graduate School of Natural and Applied Science.

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THESIS CERTIFICATION

I declare that all the information presented in this thesis report is derived and compiled following the scientific and academic rules. Moreover, any help and resources that I have sought in compiling this thesis are duly mentioned wherever required.

ÖZGE NUR FİDAN



SUMMARY

ECONOMIC ANALYSIS OF DAIRY CATTLE BREEDING ENTERPRISES REGISTERED WITH THE BREEDING CATTLE BREEDERS ASSOCIATION OF NİĞDE PROVINCE

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September 2024, 68 pages

In the study, it was evaluated according to the results of the survey conducted with a total of 176 enterprises in order to determine the economic status, structural characteristics and problems of dairy cattle enterprises affiliated to the Niğde Province Cattle Breeders Association. The number of processing animals in the region is classified as 5-19 (small-scale), 20-99 (medium-scale), 100+ (large-scale) enterprises. According to the stratified random sampling method, there are 83 small-scale enterprises, 73 medium-sized enterprises, and 25 large-scale enterprises. According to the results of the survey, feed cost is the largest expenditure item in small, medium and large-scale enterprises, 59.25% in small-scale enterprises, 64.73% in medium-sized enterprises and 68.20% in large-scale enterprises. When the average profitability and productivity ratios of dairy cattle farms of different scales were compared, it was determined that small-scale enterprises had the lowest financial and economic profitability, while they had the highest feed particle productivity and income-expense ratio. Medium-sized enterprises have higher finances than small-sized enterprises profitability and economic profitability ratios. It also has a lower expense-to-income ratio and feed particle efficiency. Large-scale enterprises have the highest rates of financial profitability and economic profitability among the three scales. Thus, it was determined that large farms are the most profitable and productive.

Key words: Niğde, dairy farming, economic analysis, productivity

ÖZET

NİĞDE İLİ DAMIZLIK SIĞIR YETİŞTİRİCİLERİ BİRLİĞİNE KAYITLI SÜT SIĞIRCILIĞI İŞLETMELERİNİN EKONOMİK ANALİZİ

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Niğde Ömer Halisdemir Üniversitesi

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Hayvansal Üretim ve Teknolojileri Anabilim Dalı

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Eylül 2024, 68 sayfa

Araştırmada Niğde İli Damızlık Sığır Yetiştiricileri Birliği'ne bağlı süt sığırcılığı işletmelerinin ekonomik durumunu, yapısal özelliklerini ve sorunları belirlemek amacıyla toplam 176 işletmeyle yapılan anket çalışması sonucuna göre değerlendirilmiştir. Bölgede bulunan işletmeler hayvan sayısı 5-19 (küçük ölçekli), 20-99 (orta ölçekli), 100+ (büyük ölçekli) işletmeler olarak sınıflandırılmıştır. Tabakalı tesadüfi örnekleme yöntemine göre örneklem büyüklüğü küçük ölçek 83, orta ölçekli 73, büyük ölçekli 25 adet işletme bulunmaktadır. Elde edilen anket sonuçlarına göre yem maliyeti küçük, orta ve büyük ölçekli işletmelerde en büyük harcama kalemi olup, küçük ölçekli işletmeler de % 59.25, orta ölçekli işletmeler de % 64.73, büyük ölçekli işletmeler de ise % 68.20'dir. Farklı ölçeklerdeki süt sığırcılığı işletmelerindeki ortalama karlılık ve verimlilik oranları karşılaştırıldığında küçük ölçekli işletmeler en düşük finansal ve ekonomik karlılığa sahipken en yüksek yem partikül verimliliğine ve gelir-gider oranına sahip olduğu belirlenmiştir. Orta ölçekli işletmeler, küçük ölçekli işletmelere göre daha yüksek mali karlılık ve ekonomik karlılık oranlarına sahiptir. Ayrıca daha düşük bir gider-gelir oranına ve yem partikül verimliliğine sahiptir. Büyük ölçekli işletmeler, üç ölçek arasında en yüksek finansal karlılık ve ekonomik karlılık oranlarına sahiptir. Böylece büyük çiftliklerin en karlı ve verimli olduğu belirlenmiştir.

Anahtar Kelimeler: Niğde, süt sığırcılığı, ekonomik analiz, verimlilik

ACKNOWLEDGMENTS

I would like to extend my heartfelt thankfulness to my supervisor Assist. Prof. Dr. Sema YAMAN FIRINCIOĞLU, for his guidance, expert supervision, fervent encouragement, moral support throughout the course of my master.

I owe a lot to my husband Hüseyin Göktuğ FİDAN, who has always been there for me and supported me.

For moral and motivational support, my sister Yasemin DOKSAR and R. Assist. I would like to express my gratitude to Özlem BORAN.

I dedicate my thesis to my mother Kezban AYDOĞAN, my father Süleyman AYDOĞAN and who have always supported me.

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SYMBOLS AND ABBREVIATIONS

Symbols	Description
%	Percent
d	Sampling error (0.10)
kg	Kilogram
l	Liter
n	Sample size
N	Number of businesses in the population,
p	0.5 (50% incidence)
q	0.5 (50% frequency of absence)
T	t scale value (1.96) at 95% confidence interval
Abbreviations	Description
DAV	Dead Animal Value
DSYB	Breeding Cattle Breeders Association
HVBY	The Year-Beginning Value of the Herd
HVEY	The Year-End Value of the Herd
IVC	Inventory Value Change
NDSYB	Breeding Cattle Breeders Association Of Niğde Province
NR	Net Returns
PAV	Value of the Animal Purchased
PCPA	Per Cow Per Annum
TDSYB	Turkish Breeding Cattle Breeders Association
Tl	Turkish Lira

CHAPTER I

INTRODUCTION

It is estimated that the world population will exceed nine billion in 2050. Rapid population growth and the resulting needs and overcapacity of limited resources pose a serious threat to agriculture. Therefore, food demand requires a 60% increase in current food production. Considering projected future consumption, the current growth trajectory of agricultural production is described as unsustainable due to its negative impact on natural resources and the environment. According to current agricultural practices, it is predicted that one third of the soil will be degraded, 75% of genetic diversity will be lost, and 22% of animal species will be threatened (Murat and Sakarya, 2012). It is important to protect animal species here. In fact, in the Livestock Diversity Information System of the Food and Agriculture Organization of the United Nations (UN); In terms of risk status, 7,112 local breeds were recorded as endangered in 1975, and the risk status of 4,389 local breeds is unknown due to lack of information or updates. In Europe alone, 51.96% of native species are at risk of extinction. Turkey is the richest country in Europe and the Middle East in terms of natural diversity. In the United Nations Food and Agriculture Organization's Livestock Diversity Information System in Turkey, 92 local species, 11 of which are endangered, have been reported and a total of 21 different breeds are stated to have become extinct due to animal genetic resources (Baş Hozman, 2014).

Livestock farming is a crucial part of agriculture and is an activity that goes beyond direct food production, involving multiple uses and capital accumulation, such as leather, fibre, fertilizer, and fuel. In this context, cattle breeding is an important activity in animal husbandry. Cattle in Anatolia BC. It is accepted that it was domesticated around 5000-6000 years ago. It spread from Anatolia to the world. It is accepted that there are nearly 300 cattle breeds in the world derived from wild forms of *Bostaurus primigenius* and *Bostaurus brachyceros* (Terin et al., 2021).

In Turkey, as in the world, animal husbandry has strategic importance in terms of ensuring adequate and balanced nutrition of the rapidly growing population and using it as a raw material for industrial and rural development. Especially in the process of

sustainable development, the livestock sector is becoming an important factor in international competition and the economic and social development of countries. The economy is mainly supported by increasing the capacity of dairy farms, their real professionalism and the subsidies given to these farms, increasing the production of milk and dairy products, and most importantly, preventing migration from rural to urban areas by increasing milk production (Bulut and Paksoy, 2023).

Approximately 25% of Niğde's agricultural production comes from animal husbandry and 75% comes from crop production. Considering that it is not possible to increase the crop cultivation area, and therefore the amount and diversity of production, people's income can be increased, and employment can be provided by increasing animal husbandry. This prevents migration from rural areas to Niğde. The same situation applies to our other provinces. At the same time, efforts must be made to develop existing companies and create large new companies. As mentioned before, to increase farming in Niğde province, the amount of milk obtained from milk production must be increased. This is achieved not only by increasing the number of animals but also by increasing the number of highly productive bulls. According to Niğde Provincial Directorate of Agriculture data, in 1997, 15.76% of the total number of dairy cows were cultured breeds and 40% were local breeds, while in 2008, 63.08% of the total dairy cows were cultured breeds and 7% were local breeds. constitutes. Increasing livestock production in Niğde province cannot be achieved only with production animals, but there are some elements that are at least as important. These include the necessary protective conditions, necessary and appropriate care and nutrition conditions, well-equipped caretakers and technical personnel, government supports, and most importantly, the participation of entrepreneurs who enjoy this job in production and market research. These elements need to be implemented as soon as possible (Doğanay and Yanar, 2023).

The aim of this study is to carry out econometric analysis in enterprises affiliated to the breeding cattle breeders' association in Niğde province. Today, the number of scientific research on dairy cattle farming in Niğde is extremely insufficient. With this study, it is aimed to contribute to the literature in this field and to reveal the current situation of dairy cattle enterprises in the province, to identify priority problems and to make various suggestions for the solution of these problems.

1.1 Cattle Breeding in Turkey

Cattle breeding in Turkey is one of the traditional agricultural activities and is carried out for the purpose of both meat and milk production. This sector is practiced by farmers operating both on large industrial farms and small-scale family businesses. Here is general information about cattle breeding in Turkey (Kıyıcı and Çınar, 2020; Murat, 2023):

- **Cattle types:** There are different types of cattle raised in Turkey that provide meat and milk yield. Especially cattle breeds such as Holstein, Simmental, Montofon, Hereford and local breeds Simmental and Anatolica are preferred.
- **Distribution and regions:** Cattle breeding is widely done throughout Türkiye. However, while there are large cattle breeding farms for meat production in the interior regions, mostly small-scale family businesses in coastal regions and rural areas focus on dairy cattle farming.
- **Dairy cattle breeding:** Dairy cattle breeding has an important place in Turkey. Dairy cattle breeding is carried out intensively, especially in the Marmara, Aegean and Black Sea regions. Dairy farming is carried out at various scales, from small-scale family farms to industrial-scale dairy farms.
- **Meat cattle breeding:** Beef cattle breeding also has an important place in Turkey. Cattle breeding is more common in farms with larger lands in the Central Anatolia, Southeastern Anatolia, and Eastern Anatolia regions. These regions generally focus on red meat production.
- **Modernization and use of technology:** Cattle breeding in Turkey has modernized over time and the use of technology has increased. This allows for more efficient milk and meat production. Various projects are carried out to provide support to farmers on issues such as feeding, milking technologies, animal health and genetic selection.
- **Support programs:** Various support programs are carried out by the Ministry of Agriculture and Forestry to encourage cattle breeding and support farmers in Turkey. These supports cover areas such as animal purchasing, feeding, vaccinations and farm modernization.

Cattle breeding in Turkey is an important sector for the country's economy and is maintained by a wide range of farmers as part of the agricultural sector (Ergün and Bayram, 2021).

1.2 Business Structure and Livestock in Turkey

Livestock has an important place and potential in Turkey's general economy and agricultural sector. Breeding activities, evaluation of some plants and by-products, increasing workforce efficiency, increasing company profits, reducing risk factors arising from natural and economic conditions, etc. Includes topics. These factors positively encourage entrepreneurship. In addition, a balanced diet is also important for public health. Türkiye is very suitable for breeding due to its natural resources and ecological conditions. However, wrong policies prevented the development of animal husbandry and the industry declined. As a result, as the number of animals decreased, the prices of the products increased, and people started to consume less animal products (Yüzbaşıoğlu, 2022).

Livestock farming is done in different ways in Turkey. The first is a village type family animal farm, and each family has an average of 1-2 animals. This type of animal husbandry is an activity that generates a small income for both family consumption and the company. Another type of animal husbandry is landless agricultural workers working outside for daily wages and raising 1-2 animals for family consumption. Another common form of livelihood is agriculture and cultivation. These are followed by specialized companies and modern livestock farms. In modern livestock enterprises, a significant part of the raw material is produced within the company, and all the concentrated feed is purchased externally (Sarıalioğlu and Laçın, 2021). Only 3% of farms in Turkey are engaged in cattle breeding alone, the rest are raised and raised jointly. The activities of companies vary depending on the size of the company. In small businesses, almost all the work is done by the company's workforce. Here one or more family members may be in a hidden unemployment situation. In large companies, labor is recruited from outside. Larger companies make better business decisions and are better able to control animal diseases, product prices, and government environmental policies. They can also easily make better decisions about the agricultural equipment they purchase. Large companies can produce output at lower costs, for example, they

can increase output by using new technologies. Large companies keep good records and track their sales well. Technical and financial efficiency is higher in large companies than in small companies (Eryılmaz et al., 2020).

When we look at the structure of livestock enterprises in Turkey, it is seen that the number of animals per farm in milk production is quite low compared to EU countries with a developed structure. Although it varies from country to country, the largest herd size consists of farms between 50-99 heads with 28.5%, while in Turkey there are farms between 1-9 heads with 81.7%. The small size of livestock farms in Turkey negatively affects many practices such as the organization and implementation of political decisions. In dairy cattle farming, 81% have 1-4 head of animals, 62% are engaged in cattle breeding, 64% are in mixed cattle breeding, 32% are in sheep breeding, and 51% are in goat breeding. From this, it can be concluded that the number of enterprises with 1-4 animals (excluding sheep breeding) is predominant (Vural, 2019). When the regions in our country are examined, Central Anatolia and Eastern Anatolia are at the forefront in animal husbandry with 28% and 21%, respectively. 26% of the sheep wealth is in Southeastern Anatolia, 14% in Eastern Anatolia; Representing goats, the Mediterranean Region ranks first with 26%, and Southeastern Anatolia ranks first with 25%. What type of livestock farming will be done in the regions is of great importance in terms of more efficient use of regional resources. In this regard, the typologies of livestock enterprises in the regions need to be well determined (Kılıç and Eryılmaz, 2020).

The structure and livestock of dairy cattle enterprises in Turkey vary in the country, which has a wide geographical area and different climates. Dairy cattle breeding in Turkey is generally carried out on varying scales, from small-scale family farms to large industrial farms. It varies depending on factors such as the size of the enterprises, their geographical location, use of technology and number of animals (Murat, 2023). Some general features regarding business structure and livestock are as follows (Çelik and Semerci, 2023):

- **Business structure:** Dairy cattle enterprises in Turkey generally consist of small and medium-sized enterprises. However, there has been an increase in the number of larger industrial farms in recent years.

- **Number of animals:** The livestock assets of businesses vary depending on the size of the business and the resources it has. Industrial farms can house thousands of dairy cattle, while small holdings generally have fewer animals.
- **Genetic structure:** The breeds commonly used in dairy cattle breeding in Turkey include Holstein, Simmental, Montofon and Turkish breeds. Enterprises generally prefer breeds with high milk yield.
- **Use of technology:** Modern technology is increasingly used in dairy cattle enterprises. This includes technological applications such as automatic milking machines, animal tracking systems, milk quality control systems and data analytics.
- **Sustainability and environmental awareness:** Sustainability and environmentally friendly practices have become important for dairy cattle enterprises in Turkey. Various measures are taken on issues such as waste management, water use and reducing environmental impacts.
- **Government supports:** Dairy cattle breeders in Turkey can benefit from various support programs provided by the Ministry of Agriculture and Forestry. These supports may include animal purchases, feeding, health checks and technological investments.

In the summary of the information given, dairy cattle breeding in Turkey constitutes an important part of the agricultural sector and is an ongoing activity to meet the country's need for milk and dairy products.

1.3 Türkiye Native Cattle Breeds and Current Situation

As of 2020, there are approximately 1.53 billion cattle in the world. Brazil has most of the world's livestock wealth, at 14.30%. In the world, Brazil is followed by India with 12.75% and the USA with 6.15%. According to 2020 data, Turkey's share in the world's livestock wealth is 1.18% and it ranks 19th in livestock wealth. According to 2021 data, there are a total of 17,850,543 cattle in Turkey. According to the latest data in Turkey, 74.83% of red meat production and 90.52% of milk production consist of cattle. Especially since the 1950s, there has been a shift towards high-productivity types of agriculture that emphasize the efficiency of animal husbandry. The yield obtained

through unconscious crossbreeding with these breeds has led to a dangerous decline, especially in native breeds (Çiçek et al., 2022).

In the Turkish Pet Genetic Resources Promotion Guide; There are local cattle breeds: Grey, East Anatolian Red (DAK), South Anatolian Red (GAK), also known as Kilis, local black, local southern yellow and zavot. Aleppo, Çukurova, Dört Yol, Kırım, Kıbrıs, Seferihisar, Caucasus, Malakan, Diyarbakır, Karacadağ, Urgan, Kara (Kalmuk), Eleşkirt, Karaisalı are extinct cattle breeds and species. According to Turkey 2021 data, 49.44% of the livestock consists of purebred, 42.80% hybrid and 7.66% domestic cattle. According to Türkiye's 2004 data, livestock existence increased by 1.78 times in 2021. Compared to 2004, the number of purebred cattle increased by 4.18 times and the number of hybrid cattle increased by 1.74 times. The number of domestic purebred cattle decreased by 61.16% compared to 2004. With the existence of domestic animals, the amount of milk produced by domestic cattle has also decreased significantly. In fact, according to Turkey's 2019 data, cow milk production is approximately 20.8 million tons. 60.36% of this comes from purebred races, 35.96% from cultured hybrid races and 3.68% from indigenous races. According to 2004 data, while the share of domestic cow milk in milk production was 18.42%, this rate decreased to 3.68% in 2019, becoming 56.82% less than 2004. Statistics show that the share of culture breeds and culture hybrid races in milk production is high (Yılmaz et al., 2020).

In our country, the cattle population has increased recently, and the presence of local breed cattle has decreased to a significant level. The decline in the availability of local breed cattle is clearly visible. According to estimates in studies in the literature, a decrease of 96.31% is expected by 2031 compared to 2020 data. In fact, it is seen that there are areas with low competitiveness in the use of animal genetic resources and increasing productivity and areas that are not suitable for valuable feed and crop production. They are distinguished by their ability to adapt to the conditions of the place of growth, as well as to survive and reproduce in constant and harsh environmental conditions. In addition, it is estimated to be disease-resistant, highly environmentally compatible, and sustainable in cases where input-intensive breeding can be limited by reasons that may arise from the possible decrease in natural resources and the negative effects of global warming. The genetic resources of domestic animals come to the fore.

In this sense, the protection and sustainability of local cattle due to their genetic resources is important (Güven and Yavuz, 2020).

1.4 Dairy Cattle Breeding in Turkey

1.4.1 The current situation

In Turkey, dairy farming is an important component of the agricultural sector and is carried out on both large industrial farms and small-scale family businesses. Dairy farming plays a critical role in meeting the demand for both milk and dairy products. Some basic information about dairy cattle farming in Turkey is as follows (Kıyıcı and Çınar, 2020; Torgut et al., 2019):

- **Dairy cattle breeds:** Among the breeds used for dairy cattle breeding in Turkey, there are breeds with high milk yield such as Holstein, Simmental, Montofon, Turkish red cattle. These breeds are generally selected for milk yield and quality.
- **Business structure:** Dairy farming is generally carried out at different scales, from small family farms to large industrial farms. Enterprises in Turkey are generally combined with mixed farming activities, that is, they engage in both dairy farming and crop production.
- **Number and distribution of animals:** The number of animals in dairy cattle enterprises in Turkey varies within a wide range. While small holdings may house a few head of cattle, industrial farms may house thousands of head of cattle. Throughout Turkey, dairy cattle farming is carried out intensively in the Marmara, Aegean, Mediterranean, Central Anatolia and Black Sea regions.
- **Genetic development and technology use:** The dairy cattle industry in Turkey has also made progress in genetic development and technology use. Factors such as selection of high-yield dairy cattle breeds and modern milking equipment are important in order to increase milk yield.
- **Production and consumption:** Turkey's milk production is carried out to meet the demand throughout the country. While the produced milk is supplied to the milk and dairy products industry, fresh milk is offered directly to the consumer.

- **Government supports:** The dairy cattle industry in Turkey is supported by the Ministry of Agriculture and Forestry. Various support programs such as animal purchase, feeding and health check are offered to farmers.
- **Sustainability and environmental factors:** Dairy farming enterprises in Turkey attach importance to sustainable agricultural practices and adopt environmentally friendly methods. Various measures are taken regarding waste management, water use and reducing environmental impacts.

Dairy farming in Turkey is an economically and socially important sector and continues to work to meet the country's milk and dairy product's needs (Koç and Uzmay, 2018).

Table 1.1. Number of Animals Milked and Amount of Milk Produced by Species in Turkey (Anonymous, TUIK 2019)

Years	Cultured Cattle		Hybrid Cattle		Native Cattle	
	Number of milking animals	Milk (tonne)	Number of milking animals	Milk (tonne)	Number of milking animals	Milk (tonne)
1991	650 739	1913 438	2087 014	4188 398	3381 244	2514 576
1992	698 223	2 065 445	2 124 103	4236 269	3247 849	2413 164
1993	750 254	2 222 701	2 214 725	4399 142	3066 975	2282 629
1994	779 690	2 309 742	2 308 308	4584 837	2994 180	2234 294
1995	870 248	2 581 711	2 392 621	4751 023	2622 717	1942 578
1996	920 185	2 723 911	2 457 923	4827 957	2590 102	1913 758
1997	879 779	2 593 152	2 355 541	4586 892	2358 974	1734 133
1998	879 841	2 576 065	2 346 093	4586 511	2263 109	1669 483
1999	903 499	2 618 031	2 424 629	4722 638	2209 764	1624 821
2000	904 849	2 639 113	2 335 119	4591 861	2039 601	1501 067
2001	912 411	2 660 282	2 248 877	4410 758	1924 526	1418 042
2002	850 725	2 467 889	1 971 740	3867 656	1570 103	1155 088
2003	1 034 817	3 215 859	2 236 680	4568 252	1768 865	1730 027
2004	832 711	3 231 461	1 699 804	4608 293	1343 206	1769 571
2005	925 618	3 596 017	1 717 309	4646 857	1355 170	1783 328
2006	1 106 679	4 295 367	1 799 409	4884 590	1281 843	1687 345
2007	1 299 750	5 050 533	1 698 801	4608 728	1230 889	1620 079
2008	1 385 730	5 380 715	1 665 189	4520 465	1029 324	1353 996
2009	1 470 886	5 713 004	1 686 064	4585 859	976 198	1284 450
2010	1 626 412	6 309 065	1 787 012	4861 835	948 417	1247 644
2011	1 868 274	7 239 644	1 962 713	5341 224	930 155	1221 560
2012	2 211 242	8 554 402	2 263 400	6 166 762	956 758	1256 673
2013	2 314 278	8 946 131	2 395 897	6 531 573	897 097	1177 305
2014	2 427 909	9 383 812	2 428 708	6 628 337	752 623	986 701
2015	2 500 880	9 672 573	2 314 061	6 315 366	720 833	945 581
2016	2 968 012	9 825 300	2 550 470	6 101 825	740 544	859 137
2017	3 429 735	11 355 932	2 764 543	6 620 539	680 329	785 846
2018	3 719 933	12 301 079	2 970 565	6 957 715	676 992	778 081
2019	3 793 401	12 544 507	3 121 496	7 473 836	664 597	764 030

There are many dairy farmers in Turkey. Although most are small businesses, the number of medium and large-sized businesses is increasing day by day. A large part of the milk production of the small enterprises that make up Turkey's dairy farming enterprises is used for domestic consumption. The milk and dairy products industry, with a production value of approximately 15% in the food sector, is an important sub-sector of animal husbandry and is important in terms of added value to the country's economy and the valuable nutrients contained in milk and dairy products (Yenice and Savaş, 2016). Considering its geographical location, Turkey has a mixed structure in terms of both climate and soil. Thrace, Marmara, Aegean Sea, and Western Mediterranean are the regions with the highest milk production. When we look at the central and eastern regions, it is seen that predominantly cattle and sheep are raised. When you look at Turkey's livestock policy, it becomes clear that it does not support the rational development of dairy farming. However, milk production in Turkey has increased slightly in the last thirty years. However, this growth is not yet at the desired level. According to researchers, the amount of milk sufficient for the Turkish population is approximately 15 million tons. However, in recent years, milk production has been around 11-12 million tons (Hozman and Akçay, 2016).

While the dairy sector in the world began to develop almost 160 years ago, Turkey's transition to the milk and dairy products industry began 52 years ago with the establishment of the first dairy factory, Atatürk Orman Çiftliği (AOÇ). This was followed by the Turkish Dairy Industrialists Association, which was established in 1963. As the private sector became interested in the production of milk and dairy products and started investments in the 1970s, the dairy industry began to modernize in its dairies and factories from the 1980s. After 1990, foreign companies started to establish partnerships with Turkish dairy companies. Although the development in the sector has not been very rapid in the last 20 years, it is seen that sector stakeholders have invested heavily in research and development (R&D) and technological issues. Approximately 40% of the milk used in the Turkish market is sold by street milkmen. 45% of the entire amount is used in dairy products and 15% is used in modern enterprises. In more developed countries compared to our country, 90% of the milk produced within national borders is evaluated in modern factories and offered for sale (Yılmaz et al., 2020)

1.4.2 Dairy cattle enterprises in Turkey

Population and income growth, which affects food preferences, has also increased the demand for animal products. It has been determined that more than 6 billion people worldwide consume milk and dairy products, and a significant majority of them live in developing countries. Due to the increasing demand for milk and dairy products in these countries, a great opportunity has been provided to productive farmers who want to increase their income. Approximately 150 million households in the world are engaged in milk production. While world milk production was 522 million tons in 1987, it increased to 863 million tons in 2019. India is the world's largest milk producer and accounts for 20% of world milk production (Torgut et al., 2019).

The total amount of Turkish milk was calculated as 23 million tons in 2019. Türkiye ranked 9th in the world in milk production. 83% of world milk production comes from cattle, 14% from buffalo, 2% from goats, 1% from sheep and 0.3% from camels. In developing countries, milk is produced on small farms and is the main source of income for families. In Turkey, dairy farming is common on small family farms. Although there are more dairy farms producing milk in Turkey compared to other countries, the number of animals per farm is low. In addition to being a food source for human health and nutrition, milk production is also important for the country's economy as Turkey's increase in its share of foreign trade (Tutkun et al., 2017). This makes dairy farming economical due to basic reasons such as having the highest species per unit milk production, adaptability to different climates and conditions, and long lactation period. The low rate of utilization of pastures in Turkey and the lack of forage crop production at the desired quality and level prevent the development of extensive and intensive cultivation. In Turkey, which has a significant potential in forage crop production, forage crop production and support should be increased in terms of sustainability of livestock production (Bakan and Aydın, 2016). In addition, the main problems of cattle breeding are the lack of growth of small family businesses, the low number of livestock in the farms, insufficient market opportunities, and the inability of farmers to benefit from information and technology sufficiently. As mentioned before, according to the 2019 Livestock Report; Of the 18 million cattle in Turkey, 48% are farm animals, 43% are hybrid cattle and 9% are domestic cattle. Although the number of large family farms producing milk has increased in the country in the last five years, small family farms are

more common. Most dairy farms have an average of fewer than 10 animals. Small and dispersed holdings increase the cost of producing milk and sending milk to processing plants. The dairy economy of the Eastern Mediterranean is changing and developing rapidly with the contributions of producer associations and cooperatives (Kılıç and Eryılmaz, 2020).

Dairy cattle enterprises are enterprises where cattle are raised and managed for the purpose of milk production. These enterprises can generally be in the form of large farms, private dairy farms, or cooperatives. Businesses often include facilities such as milking parlors, milk cooling tanks, feed stores and animal shelters. The basic elements of dairy cattle enterprises are (Özdemir et al., 2021):

- **Dairy cattle:** The holding includes dairy cattle bred specifically for milk production. These cattle are generally selected from breeds with high milk yield, health and genetic characteristics.
- **Milking equipment:** Dairy cattle are milked at regular intervals. Therefore, businesses often have modern milking equipment. Automatic milking machines, milking parlors and post-milking milk processing equipment are important components of businesses.
- **Feed stores and nutrition:** Enterprises should have a balanced feed program to increase milk yield and protect animal health. Therefore, they usually have feeding facilities such as feed stores, feed preparation areas and grazing areas.
- **Animal health and care:** Dairy cattle operations provide veterinary services to maintain animal health and optimize milk yield. This includes regular vaccinations, parasite control and disease prevention measures.
- **Milk cooling and storage:** The milk obtained after milking is transported to milk cooling tanks and stored. These tanks ensure that the milk is kept at a low temperature to maintain its quality.
- **Environmental factors:** Businesses attach importance to environmental sustainability and animal welfare. Therefore, they strive for regular waste management, sustainable water uses and environmentally friendly practices.

- **Technological applications:** Modern dairy cattle enterprises benefit from various technological applications. This includes technological solutions such as milking robots, animal tracking systems, milk quality control and data analytics.

Dairy cattle operations often involve several complex elements and aim for sustainable and efficient milk production using modern agricultural techniques and technologies. Livestock farming, which is a sub-sector of agriculture in the Turkish economy, is one of the indispensable branches of activity for agricultural enterprises. The main reason for this is; In addition to being an activity that spreads almost throughout the year and sustains producer income, unlike plant production, it is a production area that meets the needs of the producer family, such as meat, milk, yoghurt and cheese, and the farm manure needs of the business land. Livestock farming activity is very important in terms of utilizing idle labor and feed, ensuring regular cash flow, reducing business risk and migration from rural areas (Öztürk and Karkacier, 2008). Dairy farming is one of the agricultural activities that provides high added value to the Turkish economy. In 2018, milk production value constituted 44.25% of Turkey's animal production value (79.1 billion TL). As of the same year, approximately 90.58% of the total milk production in Turkey, which reached 22.1 million tons, was cow milk, while 6.45% was sheep milk, 2.54% was goat milk and 0.34% was milk. Buffalo milk is famous for its milk (USK, 2019). Of the total cattle population, which reaches 17 million heads, 49.40% consists of cultivated breeds, 41.25% of cultivated hybrids and 9.35% of native breeds (TUIK, 2019). When both FAO and TURKSTAT data are examined, dairy cattle farming activities in Turkey show significant progress. However, it is also a fact that the desired increase in productivity level cannot be achieved sufficiently. For example, according to FAO data, Turkey's cattle population increased by 44% and milk production increased by 97% in the 2003-2017 period. However, Turkey ranks 57th in the world in cow milk yield value with 3.1 tons. According to TÜİK data, the increase rate in the country's cow milk yield value remained at only 27% in the 2004-2018 period. Recently, it has been observed that studies on technical efficiency analysis in dairy cattle farming have intensified. Summaries of the studies carried out based on the economic analysis of dairy cattle farming have been briefly tried to be given in this section (Bakır and Kibar, 2019).

1.4.3 Niğde province dairy cattle enterprises

In addition to its strategic importance, agriculture stands out as one of the most important sectors in our country due to many reasons such as the large rural population of our country, its traditional understanding of production, the job opportunities it creates and its contribution to the economy. The importance of agriculture increases, especially in regions where industry is not sufficiently developed. At the same time, the main source of income of the people in the Niğde region comes from agriculture. The share of agriculture in the provincial economy is approximately 38%. The value of agricultural production in Niğde province was approximately 1 billion TL in 2008, of which approximately 25% is livestock production and 75% is crop production. The share of breeding in agricultural production is important, and cattle breeding also constitutes an important part of this production sector (Ünalın et al., 2013).

As in other areas of the market, the main purpose of animal husbandry is to produce and/or grow economically. To achieve this goal, some environmental factors (care, nutrition, shelter, health protection, etc.) that affect the harvest but are considered insufficient or negative need to be improved and improved if the desired productivity level is not achieved. It is necessary to improve genetic structures in animal husbandry or to implement these practices. In fact, it is best to consider both together. The desired production target can often be achieved only by improving environmental conditions or genetic structure. For this reason, it is necessary to first select breeds suitable for the current region and operating conditions, and at the same time provide suitable environmental conditions for these breeds. When we look at the issue in terms of breeder efficiency or genetic ability, it is seen that most cattle breeders both in our country and around the world prefer the Holstein breed, which is one of the breeds with high milk content. However, in general, the biggest problems in dairy farming are poor housing conditions, malnutrition, unplanned mating, diseases, and reproductive problems that may occur in farms that raise high-yield livestock. Traditional and small-scale local breed breeding in Niğde province from past to present has started to turn into large commercial enterprises with intensive production, especially in recent years. Today, high-yield breeds are used, although their numbers are insufficient (Tokmak et al., 2011).

According to Niğde Provincial Food, Agriculture and Livestock Department, while in 1997 approximately 16% of the total cattle population consisted of cultured breeds and 40% of local breeds, this figure increased to 77.5% in 2012, and this rate is 10%. It increased to 77.5. In addition, the total cow milk production in the province, which was 95,147 tons in 1996, increased approximately 3.5 times to 332,968 tons in 2012. Livestock farms in Niğde province have been developed mainly for raising dairy cattle, and the majority of additional livestock produced in these farms consists of male animals. Therefore, today the main income of cattle breeders is the sale of milk. From this perspective, it is very important to increase the number of dairy animals owned by breeders and especially the amount of milk obtained per dairy animal, and to create and expand fattening farms where male animals can be used as milk. This seems possible only by expanding the size of the enterprises with various incentives and supports, using breeds with high milk and meat production, and disseminating appropriate care, nutrition, health protection and breeding methods (Can and Boğa, 2019).

In Niğde province, it was determined that 42.9% of the breeders generally keep a business-specific registration system to monitor the condition of their animals. It has been determined that 25% of small-scale enterprises, 28.6% of medium-scale enterprises and all large-scale enterprises keep individual records of animals. It was determined that 50% of the enterprises had a vaccination program, and 50% did not. It was determined that 75% of the small-scale enterprises, 85.7% of the medium-sized enterprises, and all of the large-scale enterprises had a vaccination program. It was determined that 75% of the enterprises with a vaccination program had the vaccination done by veterinarians, and 25% had it done by veterinary health technicians. It has been determined that 50% of small-scale enterprises implementing a vaccination program are vaccinated by veterinarians and 50% by veterinary health technicians, and all medium and large-scale enterprises receive help from freelance veterinarians in vaccination (Murat and Sakarya, 2012). It was revealed that 75% of the companies received information support and 25% did not. It has been determined that 50% of small companies and all medium and large-sized companies receive information support. 18.18% of the companies in Niğde received information support from unions and 81.82% from cooperatives. All small enterprises receive information support from unions and cooperatives, 20% of medium-sized enterprises receive information support from unions, 80% from cooperatives, 33.33% from large enterprises and 66.67% from

unions. Dairy cattle in Niğde province gave birth to 277 births in 2014. The number of births of small and medium-sized enterprises was determined as 27, 77 and 173, respectively. In 2014, 277 (male and female) calves, 121 live and 156 dead calves were born. As of 2014, the number of calves (male and female) born in small, medium and large enterprises was determined as 27, 77 and 173. The number of live calves was determined as 0, 29 and 92 heads, and the number of dead calves was determined as 27, 48 and 81 heads. It has been determined that the milk production technology used by 70% of dairy cattle breeding enterprises in Niğde province is inadequate. Research has determined that 83.33% of small enterprises, 62.5% of medium-sized enterprises and 66.67% of large enterprises have inadequate technology in their production. It is estimated that technological inadequacies are caused by low government support in businesses, lack of skilled labor, lack of information and low profitability of the company. The reason for technological inadequacies in small businesses is undoubtedly the lack of government support and the lack of skilled labor. The scenario is not much different in medium-sized enterprises, and technological disruptions in enterprises are caused by lack of government support, lack of skilled labor and lack of financial resources (Yeşil, 2021). It is reported that another important problem in dairy cattle breeding enterprises in Niğde province is infertility. Infertility followed by miscarriage appears to be the biggest problem for all small businesses. It has been determined that the most important problems of medium and large companies are abortion and infertility (Arıkan and Gökhan, 2019). It is known that dairy cattle breeding enterprises in Niğde receive help from independent veterinarians and the district Food, Agriculture and Livestock Department in combating animal diseases.

There are certain points that need to be taken into consideration in dairy cattle breeding to avoid the mentioned negativities. Animal care is an agricultural activity that requires care. Dairy farms must pay attention to various factors to produce high-quality milk in a sustainable manner. Here are some important factors to consider in dairy cattle breeding (Bulut ve Paksoy, 2023; Bakır ve Kibar, 2019; Tokmak, 2009):

- **Animal Health:** Animal health can have a direct impact on milk quality and quantity. Routine veterinary checks, vaccinations and hygiene standards are important to maintain the health of animals.

- **Nutrition and Feeding:** A balanced and healthy nutrition program can increase milk yield. Cattle feed should be balanced in terms of protein, energy, vitamin, and mineral content. Additionally, access to water sources and clean drinking water must be provided.
- **Land and Barn Management:** A suitable barn and pen infrastructure is important for the comfort and safety of the cattle. A clean, well-ventilated, and safe environment should be provided. Additionally, proper pen planning and space allocation according to the number of cattle is important.
- **Breeding and Genetic Management:** Genetic choices between cattle breeds can create differences in terms of milk yield and resistance to diseases. For sustainable production, correct genetic choices must be made and correct reproductive management must be applied.
- **Milk Collection and Cooling:** Milk collection and cooling processes affect milk quality and safety. It is important to collect milk quickly and store it at low temperatures in accordance with hygiene standards.
- **Personnel Training:** Business employees must be trained in animal care, health control and other business management issues. Training can improve business efficiency and animal welfare.
- **Recording and Data Management:** Regular records should be kept monitoring the performance and health status of the animals. This is important to increase efficiency and detect potential problems.
- **Marketing and Business Strategies:** Milk producers should develop effective strategies to market the milk they produce. Following market demands and trends is important to make businesses sustainable.

Considering these factors can help dairy farms operate in an efficient, sustainable, and animal-friendly way.

1.5 Breeding Cattle Breeders Association

Organizations representing the sector by bringing together breeding cattle breeders in countries operate to find solutions to the problems of cattle breeders, to develop the sector and to protect the rights of their members. An organization operating in this

context in Turkey is the Turkish Breeding Cattle Breeders Association (TDSYB). The main objectives of the Turkish Cattle Breeders' Association are as follows (Karaturhan et al., 2014; Özder and Özder, 2008):

- **Representing the sector:** The Association represents breeding cattle breeders throughout Turkey. It undertakes the mission of being the voice of the sector and communicates with authorities, public institutions, and other relevant stakeholders on sectoral issues.
- **Training and information:** It organizes training programs for its members and conveys current information about the sector to its members. It carries out training and information activities on issues such as animal health, genetic selection and feeding techniques.
- **Genetic development and breed selection:** Contributes to the selection and development of breeding cattle breeds to protect and develop Turkey's genetic resources. In this context, it carries out genetic programs and projects.
- **Protecting producer rights and interests:** It strives to protect the rights of breeding cattle breeders, find solutions to their problems, and ensure a fair competition environment in the sector. It takes initiatives on issues related to producer rights.
- **Various support programs:** Turkish Cattle Breeders Association may take initiatives to create various support programs and incentives for its members. This includes areas such as animal recruitment, modernization, genetic improvement.
- **International relations:** Turkish Cattle Breeders Association cooperates with similar organizations at the international level and follows international developments in the sector.
- **Sectoral workshops and events:** It organizes various events, workshops, and meetings to evaluate the developments in the sector, strengthen communication between members and bring sector stakeholders together.

Such associations play an important role in ensuring the sustainability of the breeding cattle breeding sector, increasing the knowledge of producers, and raising standards in

the sector. Turkish Breeding Cattle Breeders Association is an important organization operating for similar purposes (Köse, 2006).

Breeders' associations were established within the framework of the Breeding Law No. 4631. DSYB is a breeding organization established within the framework of the regulation published in the Official Communiqué No. 29813 dated 26.08.2016. It works based on the province-specific pedigree system and the pedigree and performance records that form the basis of cattle pedigrees. Effective and experienced archival activities have started in our country with projects that encourage genealogy research, carried out together with the German and Italian governments. The Turkey Livestock Development Project, covering 9 provinces (Burdur, Balıkesir, Isparta, Aydın, Muğla, İzmir, Manisa, Denizli and Uşak) between 1989 and 1994, was implemented with the support of the Italian government (Terin et al., 2021). The livestock information system project, which started in 1995 and ended in 2000, covering Bursa, Konya, Edirne, Samsun, Kırklareli, Tekirdağ and Sakarya regions, was implemented together with the German government. The common aim of these projects is to create a complete registration system in our country and to establish associations that implement and maintain these registration systems. The 16 provincial unions, which completed the establishment phase in 1995, established the Turkish Breeding Cattle Breeders Central Union in 1998 (Yaylak et al., 2016).

Breeders coming together through associations aim to achieve the highest efficiency with the least expense by improving their herds. By fully understanding the "national breeding policy", by using Turkey's own production sperm (at the Menemen Artificial Insemination Station) in the provincial union members, we aim to create our own national genetics, not animals that comply with the conditions set by other countries (Demirbaş, 2020). Activities of the Central Union:

- Carrying out the Stud Book Program,
- Planning and executing the Breeding Program,
- Progeny Control studies,
- Breeding Value Estimate,
- Certification,

- Monitoring international developments,
- Representation on domestic and international platforms,
- Input supply (sperm, earrings, milk measuring bucket, insurance, etc.),
- Consultancy on breeding and nutrition issues,
- Publishing and education services.

Activities of breeding cattle breeders' provincial associations:

- Tagging of newborn calves and cattle whose ear tags have fallen off,
- Placing of new businesses,
- Monthly milk yield records and milk measurement inspections,
- Calving, insemination, herd movement records,
- Classification of cows according to their external appearance characteristics,
- Consultancy on breeding and nutrition issues,
- Input supply (semen, earrings, milk measuring bucket, insurance, equipment, etc.),
- Animal health and artificial insemination services,
- Supply and sale of breeding animals.

1.6 Milk Consumption in Turkey

In Turkey, milk and dairy products form an important part of the daily diet and are often consumed in various meals, breakfasts, and snacks. Milk consumption in Turkey may vary depending on the nutritional habits of the society, cultural factors, economic situation, and health awareness. Some basic information about milk consumption in Turkey is as follows (Kart and Demircan, 2014; Onurlubaş and Çakirler, 2016):

- **Breakfast culture:** Turkish cuisine reflects a culture that attaches importance to breakfast. Products such as milk, cheese, olives, honey and jam are frequently found on breakfast tables. Therefore, milk plays an important role in Turkish breakfasts.

- **Varieties of milk and dairy products:** A wide range of milk and dairy products are offered to consumers in Turkey. These include products such as pasteurized milk, UHT milk, yoghurt, buttermilk, cheese, butter, cream and curd cheese.
- **Traditional products:** Dairy products traditionally produced in some regions in Turkey are known for their local flavors and special production techniques. For example, Trabzon curd cheese, Van herbed cheese.
- **Milk consumption habits:** Milk consumption in Turkey varies depending on individuals' age, geographical location and lifestyle. Children generally consume more milk and dairy products during their growth years, while adults often consume milk and dairy products as part of a healthy diet.
- **Health consciousness and nutrition trends:** With increasing health awareness, the demand for healthy dairy products such as low-fat milk and yoghurt has also increased. Additionally, alternative dairy products are in demand for consumers with special dietary needs such as lactose intolerance.
- **Milk consumption and nutrition campaigns:** Various campaigns are organized to increase awareness of healthy nutrition in Turkey. In these campaigns, the importance of milk and dairy products is emphasized, and consumers are advised to consume milk as part of a healthy diet.

In Turkey, milk consumption is generally considered a part of a healthy eating habit. Nutritionists emphasize that milk and dairy products are an important component of a balanced diet due to the important nutrients they contain (Savran et al., 2011).

Adequate and balanced nutrition plays an important role in protecting and improving people's health, which leads to a better quality of life. Adequate and balanced nutrition means that the body receives the necessary amount of energy and nutrients every day. The energy and nutrients the body needs are carried to our body through food. To ensure adequate and balanced nutrition, foods are divided into four groups. These four food groups are meat and meat products, milk and dairy products, vegetables and fruits, bread, and cereals. The milk and dairy products group includes foods made from milk, such as yoghurt, cheese, and milk powder. These foods are important sources of many nutrients, including protein, calcium, phosphorus, and vitamins B2 and B12. Milk and dairy products, which are one of the animal protein sources, are not at the desired level

in terms of production and consumption in Turkey. The average per capita consumption of milk and products in European Union countries is 331 kg/year (Kılıç, 2006). In our country, this value is 171 kg/year. In recent years, the arrival of domestic and foreign investments in the milk and dairy products sector has led to increased competition in matters such as raw material supply, securing the current market and market share, and introducing products to the market. Investments in the dairy sector are increasing rapidly. The production structure, which until recently consisted of small family businesses, is gradually being replaced by advanced integrated production facilities (Karagözlü et al., 2005).

It has been determined that an oligopolistic market structure and a fully competitive market have emerged in the dairy sector. This situation directs manufacturers to cheaper cost structures, innovation, quality improvement and product diversification. For this reason, today companies' interest in market research, which determines which features of the goods or services produced are preferred, has increased. In addition, the development of the dairy sector depends on the definition of milk production, consumption, inventory and commercial information and consumers in the world and in Turkey. Statistics are a very important tool in creating policies that will ensure the development of the sector based on this information (Urak et al., 2018). Since there is no definitive data on the consumption of milk and dairy products in Turkey, per capita consumption of milk and dairy products is estimated. Since a significant part of our milk production is unregistered, it is difficult to calculate milk and dairy product consumption data. In addition, producing different dairy products from a certain amount of milk causes the unit amount to double in consumption calculations. With this, the producer's own consumption, the amount he will share with his close circle, and the unregistered milk and dairy products sold by the producer with his own capital are among the problems in calculating the personal annual consumption amount (Koyubenbe, 2015). With the increase in income level, urbanization and increasing nutrition awareness of the society, the amount of milk and dairy products produced in modern facilities has also increased. Considering our country's registered milk production amounts and foreign trade data, milk consumption per capita in 2013 is estimated to be approximately 37.3 kg. According to the research on consumers' milk consumption behavior; It is understood that it is around 60%. The amount of packaged and processed milk consumed in Turkey is considerably lower than the average per

capita consumption of packaged milk in European countries. While an average of 6 liters of packaged milk is consumed per person per year in Turkey, an average of 6 liters of packaged milk is consumed in Finland. (Ata and Yılmaz, 2015).

The relationship between breeding dairy farms and milk consumption in Turkey interacts with the general dynamics of milk production and consumption. Breeding dairy enterprises are enterprises that generally raise cattle with genetic characteristics that have high milk yield and focus on milk production. The increase in milk production of these enterprises may also be linked to milk consumption in the country. Some key factors to understand this relationship are (Küçükoflaz et al., 2019; Turan et al., 2017):

- **High-product dairy breeds:** Breeding dairy farms generally raise high-yield dairy cattle. These cattle can produce more milk thanks to their genetic characteristics and increase the milk yield of the enterprises.
- **Production capacity and milk amount:** Breeding dairy enterprises are generally large-scale enterprises and focus on high-capacity milk production. The large quantities of milk produced by these enterprises can affect milk consumption across the country.
- **Relationship with the dairy industry:** The milk produced by breeding dairy enterprises is supplied to the milk and dairy products industry. This allows the milk of the enterprises to be processed into various dairy products. These products can be offered to consumers and increase milk consumption.
- **Demand for milk and dairy products:** In Turkey, milk and dairy products generally form an important part of daily nutrition. High-quality milk from breeder dairy farms may be in demand among consumers, which may support milk consumption.
- **Healthy nutrition and campaigns:** As awareness of healthy nutrition increases, consumption of milk and dairy products can be encouraged. High-quality milk production by dairy farms can contribute to the effectiveness of such campaigns.
- **Government supports and policies:** The agricultural sector in Turkey, especially milk production, may be affected by government supports and policies. Support provided to dairy farms may encourage milk production, which in turn may affect milk consumption.

Breeding dairy farms contribute significantly to the dairy industry and can impact the consumption of milk and dairy products across the country. However, milk consumption also depends on consumers' nutritional habits, economic situation, and cultural factors (Karacan, 2017)



CHAPTER II

REVIEW OF LITERATURE

In this heading, previous studies on dairy cattle management are summarized.

According to Öztürk (2006), which aims to evaluate the economic structure and annual performance of dairy enterprises in the Yeşilyurt districts of Tokat province. Data were collected from 82 dairy enterprises through a survey. Dairy farms were divided into three groups according to the number of cows. The data belongs to the production period 2004-2005. The socio-economic structure of the enterprises was investigated. In addition, the result of annual economic activities is determined. Net income and Net farm income were found to be positive for three groups. In the study, the cost of one kg of milk was calculated and as a result, it was found that the cost of producing milk is higher than the price of milk the structure of dairy farming and marketing has been determined.

In his study, Soyak (2006) examined the structural characteristics and morphological characteristics of Alaca dairy cattle in dairy cattle management in Tekirdağ province. At the end of the research, it was reported that the support price paid in livestock support, especially in the last 2 years, has increased by almost 2 times if you are a member of the breeder association. It has been stated that membership in the union is also encouraged by the Ministry of Agriculture, and therefore the other advantages arising from membership should be conveyed very well by reaching more producers every day. In addition, there is a reason for an association that can satisfy its members and fully explain itself and the service it offers to producers to non-members, not to increase the number of its members day by day; It has been stated that as the number of members increases, its effectiveness in the province and its role in animal husbandry will also increase.

The data of the research by Nizam (2006) is obtained from public surveys of stratified random sampling of 100 enterprises registered at the Aydın Province Breeding Cattle Producers Association with 1429 enterprises. One litter raw milk cost was found 0,57 TL at studied enterprises. Generally, productivity increases with a proportional

enterprise scale. At these enterprises, labor productivity is 34,94 TL. Capital productivity is 0,096, variable inputs productivity is 1,69, and cattle unit productivity is 2311,49 TL. The efficiency average of enterprises is 79,43%. For maximizing the efficiency value, reducing the labor by 24,22%, total capital use by 28%, variable inputs by 24,41%, and the cattle unit by 23,37% are necessary.

Çiçek and Tandoğan (2008) searched to determine dairy enterprises' production activities by doing economic analysis and economical principles of how can redeem under present economic conditions in enterprises in Afyonkarahisar. According to the results, cost factors; include firstly 47,82% feed, 26,97% labor, 7,84% amortization, 7,28% other costs (energy+liquid fuel+liability capital interest+other current costs), 4,25% vets and meds, 3,25% repair and maintenance, and 2,59% general management costs. The average income distribution observed in these enterprises were as follows; milk sales, change of inventory value, and calf revenues 52,68%, 40,83%, and 6,49% respectively. In the enterprises, it was founded that average financial profitability is - 3,77%, economic profitability is 3,56%, and profitability factor is 22,40% on a scale of 0.99.

In their study, Tugay and Bakır (2009) conducted a survey in 373 enterprises in the city center and 8 districts to determine the structural characteristics of dairy cattle enterprises in the Giresun region. As a result of the study, a significant part of the enterprises in the Giresun region consists of small family enterprises and cattle breeding is seen as a source of income, especially in the high-inland districts; Accordingly, it has been reported that operators, especially in high and inland areas, attach importance to animal husbandry and want to improve their enterprises both structurally and in terms of breed. The tendency of enterprises from domestic breed breeding to cultured breeds and the increase in the number of hybrid animals has been found to be acceptable as an indicator of this, and in terms of both increasing the income of the operators and the sustainability of animal husbandry, increasing the productivity per animal in the enterprises, training the operators on herd management, care and nutrition and animal health, and improving the problems in the enterprises. In order to meet the expectations with the solution, it was deemed necessary to increase the communication with the relevant organizations. It was also stated that operators should benefit from the

advantage of organization that is effective in solving problems faster and reducing inputs.

In the study by Tokmak, Ünalın, and Çiçek (2011), the economic analysis of dairy cattle farms in the Niğde region was investigated. In the research, the data were obtained from face-to-face interviews with 100 farms selected by random sampling method. Dairy cattle farms were categorized into 3 different groups according to the number of milking cows, (1st group 5-14 heads of milking cows, 2nd group 15-29 heads of milking cows, 3rd group 30+ heads of milking cows). As a result, they found the farm size for the 1st, 2nd, and 3rd groups as 6,68%, 32,65%, and 39,29% respectively. According to the result of the study; 67,95% of Animal Production Value was provided from milk production. The 86,10% and 13,90% of total management costs came from variable and fixed costs, respectively. The gross profits of the farms were found as 10.041 TL, 44.963 TL, and 116.423 TL for the 1st, 2nd, and 3rd farm groups, respectively. Besides, the means of dairy incomes per farm were 9.136 TL, 38.666 TL, and 74.381 TL for the 1st, 2nd, and 3rd farms groups, respectively. These results showed that increasing by the number of milking cows in the farms, both milk yields per cow and the profits depending on milk production of farms also increased.

The structures and problems of the member dairy farms in the dairy cattle breeders' union of Aydın, Denizli, Niğde, and Konya provinces were investigated by Murat (2011).

The data analyzed for this purpose were obtained from 192 farms by surveying and taking the same measurements in the study. The enterprises have been defined accordingly as; small-scale with 5 heads dairy cow capacity, medium-scale with 6-15 heads dairy cow capacity, and large-scale enterprises with 165+ heads dairy cow capacity. The enterprises have been assessed according to their sizes as well as to the country basis. This study found that animals are housed in indoor-tie stalls in 58,33% of the farms in the provinces. According to the findings of this study, the cost factors consist of 57.54% feed, 12.38% another cost (energy + liquid fuel + another current cost), 8.65% amortization, 5.79% vets and meds, 5.37% labor, 5.16% interest, 3.28% repair and maintenance, and 1.84% general management costs.

In a study, an economic analysis of the dairy farming enterprises operating in the province of Hatay was conducted by Semerci, Parlakay, and Çelik (2015), data was collected from 141 dairy enterprises in 24 local areas which were determined by layered random sampling method. It was found that the total dairy enterprise assets (active capital) was 11 366 985 TL and the livestock capital share was 56.18%. The average number of cattle and cows in the enterprises was found as 11.04 and 4.87 respectively. The average milk production in the enterprises studied was about 27.4 tonnes. The average milk yield is defined as 18.73 L/head for milking cows. The total variable expenditure in the dairy farming activity is a total of 2.3 million TL and standing costs were defined as 1.3 million TL. As a result of the study, the gross production value of the dairy farming branch was estimated at 4.4 million TL. Of this figure, 83% consisted of milk and milk products. The gross margin per enterprise was 13.7 thousand TL and the net profit was 4.5 thousand TL. Milk cost was estimated as 0.94 TL/L in the study.

The average milk selling price was 1 TL/L of the enterprises in 2013. Economic profitability related to milk production activities was estimated at 7.62% and fiscal profitability at 6.05%. Results of the study show that producers need to become members of organizations providing milk marketing services.

In his study, Boz (2013) examined the structure of dairy cattle enterprises in the Eastern Mediterranean Region. As a result of the research, it was reported that there is an organizational problem among dairy cattle farmers in the region, and the organization of dairy cattle farmers is extremely important in terms of both purchasing inputs at low prices, selling the product at value prices and conducting new market research. In addition, producer organizations can employ expert personnel (veterinarians, zootechnists, agricultural economists, agronomists) and provide training to their members on animal breeding, care, nutrition, disease control, milking and hygiene, record keeping in the enterprise, animal insurance, input supply under favorable conditions and marketing. It has been stated that in this way, it will be easier to constantly monitor business activities and eliminate malfunctions.

Demir et al. (2014) examined the general structure and economic dimension of dairy cattle enterprises in the center of Kars in their study. In the study, it was reported that in order to achieve the economic benefit expected from both the shelter structure, milking

techniques and milking hygiene practices, producers should be informed technically and economically about breeding and incentives in this direction should be increased. Thus, it has been reported that the profitability of the enterprise will be increased by both increasing the efficiency in animal production and reducing the cost per unit animal.

In a study evaluating the economic activity results of dairy cattle enterprises in Konya province by Oğuz and Yener (2017), the data used in the research was obtained through a questionnaire from 125 dairy cattle enterprises which were determined with a stratified random sampling method voluntarily. The total active capital of the enterprises is \$845,330.85 and the share of animal capital is 26.27%. The average number of cattle in the enterprises has been determined to be 104.95 heads, the number of cows is 61.22 heads per farm while the average daily milk yield in the enterprises is determined as 27.45 L/ head per milking cows.

Güzel and Aybek (2017) examined the mechanization structure in dairy cattle enterprises in Kahramanmaraş province in their study. As a result of the study, increasing the average milk yield per animal, ensuring the hygiene conditions of milk, providing training to farmers on milking techniques and animal nutrition may be beneficial in increasing production, and increasing the mechanization of the enterprises, which are mostly small and medium-sized in the region, to the optimum level, which is not at an adequate level, will increase the efficiency of the enterprises. It has been stated that milking machines have a direct connection with milk quality and animal health. For this reason, it has been reported that the units that will provide technical information on the correct selection, use and maintenance of machines should operate within district cooperatives or DSYB.

In their study, Mundan et al. (2018) conducted an examination on the structural and technical features of modern dairy cattle enterprises. As a result of the investigations carried out in the study, it was seen that the livestock activities that continue widely in Şanlıurfa province have changed shape over time, especially in the last 10 years, and started to be carried out in modern facilities. However, there are also livestock enterprises built on fertile land and located within residential areas. In dairy cattle enterprises, most of the producers adopt animal husbandry as a second job. It has been reported that to make profitable livestock farming, livestock farming should be done as

the first job, and that businesses acting collectively and collectively will increase profitability. It has been stated that the establishment of large-capacity enterprises in the province should be encouraged and that it may be recommended to transform small enterprises into large enterprises. According to researchers, the demand of dairy industrialists for healthy and high-quality milk will be met. In addition, grants given for shelters and tools and equipment should be used, and businesses should be established by considering the alternative project models prepared by the Provincial Directorate of Food, Agriculture and Livestock and universities suitable for the region.

In a study aiming to analyze the economic status of the dairy farmers of Madhya Pradesh and the Indore district Gunjan conducted by Pritma, and Sharma (2019), personal interviews have been conducted among 120 dairy farmers from all four blocks of the Indore district selected through a stratified sampling technique. The dairy business has been found profitable and would be more profitable if one becomes a member of a cooperative society as he would get various benefits in terms of improved veterinary services, feed, and fodder, credit facility, and marketing system. As it was a profitable and easy credit facility, it would be a good source of generating employment for unemployed youth and women so that they could get extra income apart from cultivation, for household expenditure to improve economic conditions and standard of living. Various suggestions have been given to the government and cooperative societies related to training of dairy farmers, market development, and facilities that need to be provided to the farmers for dairy development as dairy farmers were facing constraints related to market, price, and technology which helps them for better operations and motivates others to become the part of the dairy industry.

In a study, the economic structure of dairy cattle farms in the Karcabey district of Bursa province in Turkey was analyzed by Özsayın (2019), and the number of farms in the research area was determined by stratified random sampling method. The data were collected from a total of 208 selected farms using the survey method. The average daily milk yield and lactation milk yield per cow were determined. The total production cost of the enterprises was calculated. The average feed cost per farm accounted for 52.11% of total production costs.

In a study examining the economic performance of smallholder dairy cattle enterprises in Senegal, using data from longitudinal monitoring of 113 households by Malenje et al. (2022), the mean (and standard deviation) of the net returns (NR) per cow per annum (PCPA) was found 21.7 (202.9) USD, whilst the NR per household herd per annum was 106.1 (1740.3) USD. Only about half (52.2%) of the dairy cattle enterprise had a positive NR. It was reported that the most significant income components were milk sales followed by animal sales, whilst the most significant cost components were animal feed followed by an animal purchase.



CHAPTER III

MATERIALS AND METHODS

The study will be carried out in dairy cattle breeding enterprises registered with the Breeding Cattle Breeders Association in Niğde province.

3.1 Material

The main material of the research was the data obtained through the survey of dairy cattle breeding enterprises registered with the Breeding Cattle Breeders Association of Niğde Province in 2022. The interviews were conducted face-to-face. In addition, previous scientific studies on the subject of secondary data provided by public and private institutions was used.

3.2 Methods

Selecting of sample size and research area:

Dairy cattle breeding enterprises registered with the Breeding Cattle Breeders Association of Niğde province have been determined as research areas. The number of enterprises to be examined in the research was determined by stratified random sampling. One of the main reasons for determining the stratified random sampling method is that the business groups are determined homogeneously and the findings obtained for the business groups are evaluated.

The sample size was calculated using the following formula;

$$n = \frac{N.t^2.p.q}{d^2.(N-1)+t^2.p.q} \quad (3.1)$$

Formula;

n= Sample size

N= Number of businesses in the population
t: t scale value (1.96) at 95% confidence interval
p: 0.5 (50% incidence)
q: 0.5 (50% frequency of absence)
d: Sampling error (0.10)

According to the stratified random sampling method, the sample value was determined as 176 enterprises. The enterprises located in the region are classified as enterprises with a number of animals of 5-19 (small scale), 20-99 (medium scale), and 100 and above (large scale). According to the stratified random sampling method, the sample size was 83 in small-scale enterprises, 73 in medium-scale enterprises, and 20 in large-scale enterprises.

3.3 Preparing the Questionnaire

The data required for the research were collected through a survey methodology. A questionnaire consisting of 5 parts was prepared for this purpose. The first part of the survey includes questions aimed at revealing the demographic characteristics of the participants, such as age, gender, education, etc. In the second section, demographic information about the business is included. The third section contains information about the buildings in operations. In the fourth section, the expenses of the enterprise, and in the last section, the revenues of the enterprise are included. The survey questions are in Appendix 1.

3.4 Method of Data Analysis

In this study, the economic analysis of dairy cattle breeding enterprises was revealed using basic statistical methods.

In the economic analysis method, the productive value increase, economic profitability, the unit cost of milk, and variable expenses will be calculated separately for each of the small, medium and, large-scale business types in order to evaluate the registered dairy cattle breeding enterprises of the Cattle Breeders Association of Niğde province from an economic perspective.

In the economic analysis method, the calculations were made separately for each of the business size categories: small-scale, medium-scale, and large-scale.

The following analyses were performed:

Productive Value Increase= (End of period herd value + value of animals sold + the value of slaughtered animals) (3.2)

Economic Profitability (According to Gross profit) = (Gross profit / Active capital) * 100 (3.3)

Economic Profitability (According to Net profit) = (Net profit / Active capital) * 100 (3.4)

Unit Cost of Milk (Kg/TL) = Total production costs – (Calf value + Fertilizer income) / amount of milk produced (3.5)

Feed expenses; In this study the feed expenses of the enterprises were evaluated separately as roughage and concentrate feed. The costs for purchased the roughage and concentrate feeds purchased were calculated based on their purchase prices. For the feed produced within the enterprise, the costs either directly as at, 80% of the prevailing market price in cases where direct calculation was not feasible.

For those are purchased; amount*price(±transport)

For those produced in the enterprice (yard cost); Market selling price-Estimated marketing expenses

Labor expenses; Labor expenses were evaluated separately as family labor and hired labor. Monthly payments to hired labor will be assessed according to the declaration of the owner of the enterprise or based on the minimum wage. The family labor force, on the other hand, was evaluated at the minimum wage after being converted into an adult male labor force unit.

Veterinary medical expenses; Veterinary services, vaccines, and medicines purchased by taking into account the statements of the business owners were evaluated together.

Electricity and water expenses; The amount of water and electricity used in the enterprises was taken into account by the declaration of the farmers.

Loan interest rates; foreign capital interest used for the enterprise will be examined. Interest rates will be determined by comparing the grower's declaration with the Ziraat bank interest rates and calculations will be made accordingly.

Inventory value change: The year- end value of the herd is obtained by subtracting the new year's value of the herd and the purchased animal value from the result obtained from the sum of the sold animal value and the deceased animal value to calculate the inventory value change the formula below was used;

$$IVC = HVEY + SAV + DAV - (HVBV + PAV) \quad (3.6)$$

IVC; Inventory value change

HVEY; The year-end value of the herd

DAV; Dead animal value

HVBV; The year-beginning value of the herd

PAV; Value of the animal purchased

Cost of milk given to calves: It was calculated by multiplying the quantity of milk given to calves by the price per liter milk during the specified period.

Live asset amortization: To meet the economic wear and tear of existing dairy cows in the enterprise, the live amortization value was calculated by subtracting the butchery value from the stud value and dividing it by the economic life.

Depreciation of buildings and equipment: The 'straight-line method' was used to calculate the value decreases that occur as a result of wear and tear of buildings and equipment. Based on this method, depreciation value was determined by subtracting the

scrap value from the acquisition value adjusted for inflation and subsequently dividing it by asset's economic life.

$$\text{Annual depreciation} = (\text{Current Acquisition Value} - \text{Scrap Value}) / \text{Economic Life} \quad (3.7)$$

Maintenance and repair expenses; These expenses include the costs for the maintaining and repairing the barn, haystack, feed warehouse, silo, and caretaker buildings used in dairy cattle breeding. In cash where there are incomplete records of these expenses, 1% of the acquisition price was considered for as maintenance; and 2% was for repair costs.

Other expenses; include expenses such as transportation, litter, communication, and stationery.

The total amount of expenses consist of the sum of feed, breeding heifer, labor, veterinary health, maintenance-repair, depreciation, lighting-water, and other expenses. The calculation of operating income was made as follows.

Secondary revenues consist of income-from fertilizer, calf sales and increases in inventory assets.

Calf income was obtained by multiplying calves under the six months of age in the farm by the market price of calf in that region.

Fertilizer sales revenue; If fertilizer sale, it was sold, income was calculated by multiplying the amount of fertilizer sold by the unit price. If the fertilizer was not sold or was used in the farm, it was not be included in the accounts.

Milk sales revenue; Milk sales revenue, which constitutes a large part of the operating income, was calculated by multiplying the amount of milk produced by the unit sales price.

The total revenues consist of milk sales revenue and secondary revenues.

The total cost calculated by subtracting the total ancillary revenues from the total general expenses.

Unit production cost = Total expenses (TL) - Total secondary income (TL) / Total amount of milk produced (L) (3.8)

Net profit/loss; was calculated by subtracting total cost from milk sales revenue.

Determination of Capital Structure

In the research conducted, the working capital was calculated by using the survey data as follows.

I. Active Capital

- A. Real Estate Capital
- B. Animal Capital
- C. Working Capital
 - 1. Equipment Capital
 - 2. Material Capital (Feed, Fuel oil etc.)
 - 3. Safety box

II. Passive Capital

III. Equity Capital

It is seen that working capital consists of active, passive, and equity capital.

Real estate capital; consist of the sum of the acquisition costs of buildings such as shelters, barns, haystacks, feed warehouses, and caretaker's houses used in the production process of the enterprise.

Live animal capital; The value of cows, heifers, calves, and breeding bulls in the dairy cattle unit of the enterprise at the beginning of the period was taken as live animal capital.

Working capital; Instrument equipment and material capital, which allows benefiting from real estate and live animal capital, as well as revolving funds and the sum of money available in the coffers of the enterprise was constitute the entire working capital.

Passive capital; All kinds of debts of the business against third parties was evaluated in this section.

Equity capital; consists of the difference between active capital and passive capital.

Establishment of Profitability Ratios

Technical and Economic evaluation analyses was carried out in two ways.

Technical Evaluation Rates

In the technical analysis part of the study, the fertility status of the milking animals in the transmission and the success status of the enterprise in milk production was examined.

3.5 Economic Assessment Rates

The profitability ratio is one of the indicators of whether businesses are economically successful or not. In the enterprise, it is defined as the ratio of the profit obtained in a certain period to the capital used in the enterprise.

Profitability Ratios are the ratios that serve to measure the success achieved as a result of the activities carried out by the enterprise.

Financial profitability; This is also called Equity Profitability. It is accepted as a measure of success in business operations and shows the extent to which equity capital is used efficiently. The net profit obtained at the end of production is expressed as the ratio of the same period to the equity capital. Financial profitability is calculated as follows:

$$\text{Financial Profitability} = \text{Net Profit} / \text{Equity Capital} \quad (3.9)$$

Economic profitability is a measure of how profitably and efficiently the economic resources used during production are used. It is the ratio of the net profit obtained at the end of production and the total interest of passive capital to active capital.

$$\text{Economic Profitability (According to Net profit)} = (\text{Net profit} / \text{Active capital}) * 100 \quad (3.10)$$

In addition, the cost-product ratio was calculated by looking at the ratio of the total sales revenue received by the enterprise in a certain period to the total expenses for the same period.

$$\text{Cost-Product Ratio} = \text{Total Sales Revenue} / \text{Total Expenses} \quad (3.11)$$

The fact that the cost-product ratio is equal to 1 indicates the transition point to profit. If this ratio is greater than one, it indicates that the business is profitable, and if it is smaller than one, it indicates that the business is losing.

The profitability factor is calculated by dividing the net profit obtained at the end of production and the sum of passive capital interest by the sum of revenues.

CHAPTER IV

RESULTS

Table 4.1. Gender of participants by scale

Scale	N	Female %	Male %
Small	83	1.2	98.8
Medium	73	5.5	94.5
Large	20	0.0	100.0

A total of 176 participants were interviewed. The rate of women among those interviewed in small-scale enterprises was 1.2%, and in medium-sized enterprises it was 5.5%. In large-scale enterprises, no women were interviewed (Table 4.1).

Table 4.2. Age of participants by scale

Scale	N	Mean	Median	Min	Max
Small	83	51.71 (+/- 10.1)	53.00	29	73
Medium	73	48.55 (+/- 9.6)	48.00	30	73
Large	20	42.75 (+/- 8.1)	41.50	26	62

In large-scale enterprises, the youngest participant was 29 years old, while the oldest participant was 73 years old. The situation was similar in medium-sized enterprises. So much so that in medium-sized enterprises, the youngest participant was 30 years old and the oldest participant was 73 years old. In large-scale enterprises, there was a younger profile. The youngest participant was 26 years old and the oldest participant was 62 years old. Considering the average age, the oldest participant group was the participants of small businesses (Table 4.2).

Table 4.3. Education of participants by scale

Scale	n	Informally educated	Primary	Elementary	High	College	Other
Small	83	2.4	36.1	24.1	25.3	10.8	1.2
Medium	73	0	30.1	17.8	43.8	2.7	5.5
Large	20	0	5.0	30.0	45.0	10.0	10.0

In medium and large-scale enterprises, the proportion of high school graduates is higher compared to small-scale enterprises. The proportion of college graduates in medium-scale enterprises is lower compared to large and small-scale enterprises. Participants with education from other institutions are more prevalent in large enterprises compared to others (Table 4.3)

Table 4.4. Participation in educational activities

Scale	N	Yes %	No %
Small	83	16.9	83.1
Medium	73	23.3	76.7
Large	20	35.0	65.0

Participants in large-sized enterprises declared that they participated in more training activities than participants in medium and small enterprises (Table 4.4)

Table 4.5. Main Occupation Status of Dairy Farming

Scale	N	Yes %	No %
Small	83	90.4	9.6
Medium	73	89.0	11.0
Large	20	100.0	0.0

The majority of participants were primarily engaged in dairy farming (Table 4.5).

Table 4.6. Workforce Employment Status

Scale	N	Family worker (mean)	Employers hiring foreign labour %	Employers hiring veterinarians %
Small	83	3.17	2.4	0.0
Medium	73	2.42	35.6	9.6
Large	20	2.35	90.0	40.0

The employment rate of family workers is 3.17% for small businesses, 2.42% for medium-sized businesses, and 2.35% for large-scale businesses. The employment rate of foreign workers is 2.4% in small businesses, 35.6% in medium-sized businesses, and 90% in large businesses. None of the small businesses have a contract with a

veterinarian. 9.6% of medium-sized businesses have a contract with a veterinarian. 40% of large-scale businesses have a contract with a veterinarian (Table 4.6).

Table 4.7. Credit and insurance status

Scale	N	Credit utilization status		Insurance status	
		Yes	No	Yes	No
Small	83	27.7	72.3	15.7	84.3
Medium	73	64.4	35.6	58.9	41.1
Large	20	85.0	15.0	80.0	20.0

While 27.7% of small businesses used loans, 64.4% of medium-sized businesses and 85% of large-scale businesses stated that they used loans. Similarly, while 15.7% of small-scale enterprises insured their animals, 58.9% of medium-sized enterprises and 80% of large-scale enterprises insured their animals (Table 4.7).

Table 4.8. Percentage Distribution of Economic Analysis Findings in Small-scale Enterprises

	Nigde
1. Total Feed Cost	59.25
a) Cost of Homegrown Concentrate Feed (%)	38.69
b) Cost of Homegrown Roughage Feed (%)	13.73
c) Cost of Purchased Concentrate Feed (%)	26.01
d) Cost of Purchased Roughage Feed (%)	21.56
2. Total Labor (%)	4.20
a) Foreign Labor (%)	0.75
b) Family Labor (%)	99.25
3. Healthcare Expenses of the Business (%)	0.28
4. Water Expenses (%)	0.03
5. Electricity Expenses (%)	0.12
6. Fuel Expenses (%)	0.75
7. Business Insurance Expenses (%)	0.00
8. Loan Interest Rate (%)	1.79
9. Milk fed to calves (%)	0.41
10. Annual Feed Expense (%)	5.41
11. Annual Watering Expense (%)	2.53
12. Annual Milking System Expense (%)	5.04
13. Annual Tractor Expense (%)	17.14
14. Other Equipment Expense (%)	3.98
15. Building Expense (%)	0.76
16. TOTAL EXPENSES	100.00
17. REVENUES	
a) "Milk Revenue (%)	99.75
b) Calf Revenue (%)	0.24
c) Manure Revenue (%)	0.005
18. TOTAL REVENUES	100

Table 4.8 illustrates the percentage distribution of economic analysis findings in small-scale enterprises in Niğde province, Turkey. The findings are categorized into expenses and revenues. The largest expense category, constituting 59,25% of total expenses, is feed cost. This is followed by labor with a share of 4.20%. Other significant expenses include health (0.28%), water (0.03%), electricity (0.12%), fuel (0.75%), and loan interest rate (1.79%). The feed cost is divided into four sub-categories: homegrown concentrate feed (38.9%), homegrown roughage feed (13.73%), purchased concentrate feed (26.01%), and purchased roughage feed (21.56%). Labor cost is divided into two sub-categories: foreign labor (0.75%) and family labor (99.25%)

Table 4.9. Percentage Distribution of Economic Analysis Findings in Medium-scale Enterprises

	Nigde
1. Total Feed Cost	64.73
a) Cost of Homegrown Concentrate Feed (%)	1.54
b) Cost of Homegrown Roughage Feed (%)	22.57
c) Cost of Purchased Concentrate Feed (%)	37.68
d) Cost of Purchased Roughage Feed (%)	38.20
2. Total Labor (%)	0.53
a) Foreign Labor (%)	50
b) Family Labor (%)	50
3. Healthcare Expenses of the Business (%)	0.75
4. Water Expenses (%)	0.21
5. Electricity Expenses (%)	0.88
6. Fuel Expenses (%)	1.53
7. Business Insurance Expenses (%)	0.05
8. Loan Interest Rate (%)	1.29
9. Milk fed to calves (%)	0.87
10. Annual Feed Expense (%)	6.42
11. Annual Watering Expense (%)	3.92
12. Annual Milking System Expense (%)	8.63
13. Annual Tractor Expense (%)	3.02
14. Other Equipment Expense (%)	1.43
15. Building Expense (%)	5.75
16. TOTAL EXPENSES	100.00
17. REVENUES	
a) "Milk Revenue (%)	99.60
b) Calf Revenue (%)	0.38
c) Manure Revenue (%)	0.02
18. TOTAL REVENUES	100.00

Table 4.9 illustrates the percentage distribution of economic and social factors in a medium-scale dairy farm. These factors provide insight into how they contribute to the total expenses and revenues of the farm. Feed is the largest expense item in medium-scale cattle farms.(64.73%) This indicates the need for farms to optimize their feed management practices and utilize local feed resources to reduce this cost. Labor cost is a relatively small expense item in the table. (0.53%)This means that farms can further reduce this cost by utilizing automation and labor-saving technologies. Water is an important input in milk production, used for irrigation and animal hygiene. Therefore, it is important to use water-saving practices to reduce water expenses. Electricity is used for cooling, lighting, and equipment operation in cattle farms. Investing in energy-efficient equipment and optimizing electricity usage can help reduce this cost. Fuel is used for operating equipment and vehicles. Investing in fuel-efficient vehicles and optimizing fuel usage can help reduce this cost. Loan interest rates represent the borrowing cost for farms. Farms can reduce this cost by optimizing their borrowing needs and seeking loans with lower interest rates.

Table 4.10. Percentage Distribution of Economic Analysis Findings in Large-scale Enterprises

	Nigde
1. Total Feed Cost	68.20
a) Cost of Homegrown Concentrate Feed (%)	5.12
b) Cost of Homegrown Roughage Feed (%)	30.10
c) Cost of Purchased Concentrate Feed (%)	32.21
d) Cost of Purchased Roughage Feed (%)	30.57
2.Total Labor (%)	0.46
a) Foreign Labor (%)	50
b) Family Labor (%)	50
3. Healthcare Expenses of the Business (%)	0.52
4. Water Expenses (%)	0.13
5. Electricity Expenses (%)	0.24
6. Fuel Expenses (%)	0.05
7. Business Insurance Expenses (%)	0.71
8. Loan Interest Rate (%)	1.17
9. Milk fed to calves (%)	24.04
10. Annual Feed Expense (%)	0.21
11. Annual Watering Expense (%)	0.15
12. Annual Milking System Expense (%)	0.29
13. Annual Tractor Expense (%)	2.34
14. Other Equipment Expense (%)	1.89
15. Building Expense (%)	0.50

16. TOTAL EXPENSES	100.00
17. REVENUES	
a) Milk Revenue (%)	99.64
b) Calf Revenue (%)	0.34
c) Manure Revenue (%)	0.03
18. TOTAL REVENUES	100.00

Table 4.10 illustrates the percentage distribution of economic and social factors in a large-scale dairy farm. These factors provide insight into how they contribute to the total expenses and revenues of the farm. Feed is the largest expense item in large-scale cattle farms. This indicates the need for farms to optimize their feed management practices and utilize local feed resources to reduce this cost. Labor cost is a relatively small expense item in the table. This means that farms can further reduce this cost by utilizing automation and labour-saving technologies.

Table 4.11. Average Values of Profitability and Efficiency Ratios by Business Scales

	Small-scale	Medium-scale	Large-scale
1. Financial Profitability (%)	-0.62	-0.53	-0.57
2. Economic Profitability	0,26	3,27	3,27
3. Profitability Factor (%)	-0.023	-0,015	-0,19
4. Expense-to-Income Ratio	1.62	1.53	8.38
5. Feed Partial Efficiency (lt/kg)	0,65	0,62	0,53

Table 4.11 compares the average profitability and efficiency ratios in dairy farms of different scales. The table contrasts three different business scales (small, medium, and large) and presents the average values of profitability and efficiency indicators for each scale. Small farms have the lowest financial profitability and economic profitability ratios among the three scales. They also have the highest expense-to-income ratio and feed particle efficiency. This indicates that small farms are less profitable and less efficient. Medium-sized farms have higher financial profitability and economic profitability ratios compared to small farms. They also have a lower expense-to-income ratio and feed particle efficiency. This means that medium-sized farms are more profitable and efficient. Large farms have the highest financial profitability and economic profitability ratios among the three scales. They also have the lowest expense-to-income ratio and feed particle efficiency. This indicates that large farms are the most profitable and efficient.

CHAPTER V

DISCUSSION

The findings of this thesis, which aims to conduct economic analyses of dairy cattle breeding enterprises registered in the Association of Breeding Cattle Breeders of Niğde Province according to their sizes (small, medium, large), are presented above. The discussion section elaborates on these findings in the light of the literature.

The vast majority of respondents answering the questions in all enterprises were male. This indicates that the majority of business owners in Niğde province are predominantly male. While a definitive relationship between age and enterprise size could not be established, it was observed that owners of large enterprises tended to be relatively young. The vast majority of operators' primary occupation was cattle farming. Large enterprises had a higher rate of employing foreign workers. Similarly, the rates of employing veterinarians were also higher compared to other enterprises. The rate of credit utilization and insurance coverage for their animals was higher in large enterprises compared to other enterprises.

The findings of this study aimed at small enterprises highlight the significant roles of feed costs and labour in the overall economic structure of small-scale businesses in Niğde province. The detailed breakdown of feed costs and labour provides information on the specific components that contribute to these major expense categories, thereby facilitating a more comprehensive understanding of the economic dynamics within these enterprises.

The analysis of economic and social factors in a medium-scale dairy farm offers enlightening information on the impacts on expense and revenue items. Notably, feed expenses are a significant cost element in these farms, a condition that also mirrors characteristics of smaller-scale farms. Therefore, enhancing feed management strategies and utilizing more local resources can significantly reduce costs. Additionally, employing innovative, labour-saving technologies like automation can lower labour costs.

Water usage plays a critical role, especially in irrigation and animal hygiene. Adopting water-saving techniques to reduce water expenses is crucial for both cost control and environmental sustainability. Electricity consumption is a significant expense in farms for cooling, lighting, and equipment operations. The use of energy-efficient equipment and rational management of electricity consumption can facilitate savings in these expenses.

Fuel consumption is essential for the operation of farm equipment and vehicles. Employing fuel-efficient vehicles and optimizing fuel usage can significantly minimize these costs. These strategies can help medium-scale dairy farms achieve both economic and environmental sustainability goals.

The impacts of feed and labour costs on farm operations are observed in large-scale enterprises, as in medium and small-scale ones. Therefore, this situation should be examined in depth. Feed cost is also high for large enterprises. Therefore, improvements in this area can enhance the profitability of all enterprises. The cost-effectiveness and operational efficiency of these improvements are crucial.

According to Öztürk (2006), the study conducted on the economic structure and annual performance of dairy farms in the Yesilyurt district of Tokat province utilized data from 82 dairy cattle farms. These farms were divided into three groups based on the number of dairy farms, and data from the production period of 2004-2005 were examined. The study investigated the socio-economic structure of the farms and determined the results of their annual economic activities. Net income and net farm income were found to be positive for all three groups. Additionally, the cost of producing one kilogram of milk was calculated, revealing that the production cost of milk exceeds the milk price. The study also thoroughly examined the structure of dairy farming and marketing. In our study, for the year 2023, the financial profitability and profitability factor of three groups of businesses in Niğde were found to be negative.

The data from the study conducted by Nizam (2006) were obtained through stratified random sampling and public surveys conducted on 1429 farms registered with the Aydın Province Livestock Breeders Association. The cost of one liter of raw milk was determined to be 0.57 TL in the examined farms. Generally, it was observed that

efficiency increases with a proportional scale of operation. The labor efficiency in these farms is 34.94 TL. Capital efficiency is 0.096, variable input efficiency is 1.69, and large livestock unit efficiency is 2311.49 TL. The average efficiency level of the farms was determined to be 79.43%. To maximize efficiency, labor usage should be reduced by 24.22%, total capital usage by 28%, variable input usage by 24.41%, and livestock units by 23.37%. In our study, although efficiency is negative, it increases as the scale of operation grows. In this regard, our findings align with those of Nizam (2006).

Çiçek and Tandoğan (2008) conducted economic analyses and assessments of milk farms in Afyonkarahisar to determine how they could be amortized under current economic conditions. According to the results obtained, the cost factors consist of 47.82% feed, 26.97% labor, 7.84% depreciation, 7.28% other costs (energy + liquid fuel + debt capital interest + other current expenses), 4.25% veterinary and medicine, 3.25% repair and maintenance, and 2.59% general administration expenses. The average income distribution observed in these farms is as follows: milk sales account for 52.68%, changes in stock value for 40.83%, and calf revenues for 6.49%. It was determined that the average financial profitability was -3.77%, economic profitability was 3.56%, and profitability factor was 22.40% in these farms with an average scale of 0.99. The importance of milk revenue is also evident in our study.

The economic analyses of dairy farming enterprises in the Niğde region were examined in the study conducted by Tokmak, Ünalın, and Çiçek (2011). In the scope of the research, face-to-face interviews were conducted with 100 farms selected using random sampling method. Dairy farming enterprises were divided into three different groups based on the number of lactating cows. These groups were determined as follows: 1st group (5-14 lactating cows), 2nd group (15-29 lactating cows), and 3rd group (30+ lactating cows).

According to the results obtained, the farm sizes for the 1st, 2nd, and 3rd groups were determined as %6.68, %32.65, and %39.29, respectively. According to the findings of the study, 67.95% of the Animal Production Value was obtained from milk production. 86.10% of the total management costs consisted of variable costs, while 13.90% consisted of fixed costs. The gross profits of the enterprises were calculated as 10,041 TL, 44,963 TL, and 116,423 TL for the 1st, 2nd, and 3rd enterprise groups, respectively.

Additionally, the average milk income per farm was determined as 9,136 TL, 38,666 TL, and 74,381 TL for the 1st, 2nd, and 3rd enterprise groups, respectively. These results indicate that as the number of lactating cows increases in the enterprises, both the milk yield per head and the profitability of the farms dependent on milk production increase.

In the study conducted by Murat (2011), the structures and problems of dairy farming enterprises affiliated with the dairy farming association in Aydın, Denizli, Niğde, and Konya provinces were examined. For this purpose, data from 192 enterprises were analyzed through surveys and consistent measurements. The enterprises were classified as small-scale with a capacity of 5 dairy cows, medium-scale with 6-15 dairy cows, and large-scale with 165+ dairy cows. The enterprises were evaluated according to their sizes, similar to the national scale.

The study revealed that 58.33% of farms in the provinces housed animals in closed tie-stall barns. When the cost factors were examined, it was found that 57.54% of the costs were attributed to feed, 12.38% to other expenses (energy + liquid fuel + other current costs), 8.65% to depreciation, 5.79% to veterinary and medication expenses, 5.37% to labor, 5.16% to interest, 3.28% to repair and maintenance expenses, and 1.84% to general administrative expenses.

In a study conducted by Semerci, Parlakay, and Çelik (2015), the economic analysis of dairy farming enterprises operating in Hatay province was conducted. Data were collected from 141 dairy farming enterprises located in 24 different local areas using a stratified random sampling method.

According to the research findings, the total value of active assets of the enterprises was determined as 11,366,985 TL, with 56.18% of these assets constituting the livestock capital share. The average number of large cattle per enterprise was found to be 11.04, while the average number of cattle was 4.87. The average milk production per enterprise was approximately 27.4 tons, with an average milk yield of 18.73 liters per head for milking cows.

The total variable expenditure in dairy farming activities was calculated as 2 million TL, while the total cost was estimated at 1.3 million TL. The gross production value of the dairy farming sector was predicted to be 4.4 million TL, with 83% of this value attributed to milk and dairy products. The gross profit margin per venture was calculated as 13.7 thousand TL, with a net profit of 4.5 thousand TL.

The cost of milk production was calculated as 0.94 TL/L, and the average selling price of milk for enterprises was 1 TL/L in 2013. The economic profitability of milk production activities was estimated at 7.62%, while the financial profitability was estimated at 6.05%. The results of the study indicate the importance of dairy farmers becoming members of organizations providing milk marketing services.

In a study conducted by Oğuz and Yener (2017), the economic activity results of dairy farming enterprises in Konya province were evaluated. Data were collected through surveys from 125 dairy farming enterprises determined using optional stratified random sampling method. According to the study results, the total active capital of the enterprises was found to be 845,330.85 dollars, with 26.27% of this capital representing livestock capital. The average number of cattle in the enterprises was found to be 104.95 heads, with an average of 61.22 heads per farm. Additionally, the average daily milk yield per milking cow in the enterprises was determined as 27.45 liters.

CHAPTER VI

CONCLUSION

In the study conducted among the members of the Damızlık Sığır Yetiştiricileri Birliği (Breeding Cattle Breeders Association) in Niğde, the economic analysis of dairy cattle farms and socio-economic data along with some technical parameters of the farms were examined. Within the scope of this study, the farms in Niğde were grouped and evaluated comparatively based on the province and their scales.

Small-scale farms in Niğde are typically family-run businesses managed with limited resources. These farms usually focus on local markets and tend to have fewer animals.

Medium-scale farms, on the other hand, have more resources and are managed more professionally. They often supply their products to regional markets and have a higher number of animals.

Large-scale farms operate at an industrial scale and typically have large herds of cattle. These farms supply their products to national or international markets and have a higher production capacity. Analyzing the structures and business models of dairy cattle farms in different scales in Niğde is important for understanding the diversity in the sector and evaluating the status of cattle breeding in Niğde. This analysis could be beneficial for planning and implementing support programs for local breeders and developments in the sector. The data indicates significant differences in participant profiles and business practices across different business scales. In light of these findings, the following conclusions can be drawn:

- **Female Participation and Profile:** Female participation is higher in small and medium-sized enterprises, but almost nonexistent in large-scale enterprises. This suggests that larger businesses need to make more efforts towards female employment and participation.
- **Age Distribution:** Young participants are more prevalent in large enterprises, indicating that they have a younger and more dynamic workforce, while smaller businesses exhibit a relatively older profile.

- **Education Level:** The proportion of high school and university graduates is higher in medium and large-scale enterprises. However, participants with education from other institutions are particularly common in large enterprises, indicating that larger businesses are more active in providing education and development opportunities.
- **Employment and Insurance:** Family employee employment is low in medium and large enterprises, but the employment of foreign workers is more common. Additionally, larger enterprises are more organized in contracting with veterinarians and obtaining animal insurance.

Financial Practices: Large enterprises stand out in credit usage and animal insurance. This indicates that larger businesses have better access to financial resources and are more conscious of risk management.

Overall, these results demonstrate that small, medium, and large-scale enterprises have different needs and challenges. Considering this diversity, it is important to provide tailored policies and support for each business scale. Efforts should also be made to reduce differences among businesses in areas such as gender equality, education, and financial access.

The percentage distribution of economic analysis findings for small-scale enterprises in Niğde province is provided in Table 4.8. According to these findings:

- **Distribution of Total Expenditures:** Feed cost is the largest expenditure item, constituting 59.25% of total expenditures. This indicates that businesses should focus on managing feed costs.
- **Details of Feed Cost:** Feed cost is divided into four sub-categories, with cost of homegrown concentrate feed comprising the largest share (38.69%).
- **Labor Cost:** Labor cost constitutes 2.51% of total expenditures. This suggests that businesses could focus on increasing labor productivity.
- **Other Expense Items:** Other expense items such as health, water, electricity, fuel, and credit interest rate are also represented with certain percentages.

Tables 4.9 and 4.10 provide the percentage distributions of economic and social factors in medium and large-scale dairy farms. The key findings from these tables are as follows:

- **Feed Expenditures:** Feed cost is the largest expenditure item in medium and large-scale farms as well. This indicates that all farms need to optimize feed management.
- **Labor and Other Expenses:** Labor cost typically has a small share of total expenditures. This suggests that farms could turn to technological solutions to increase labor efficiency.
- **Water, Electricity, and Fuel:** Other expense items like water, electricity, and fuel are important for farms and offer optimization opportunities.
- **Credit Interest Rates:** In large-scale farms, credit interest rates emerge as a larger cost item. This indicates that farms need to be careful about financial planning and credit management.

These findings indicate that farms of different scales face similar challenges and can make improvements in specific areas.

Table 4.11 compares the average profitability and efficiency ratios in dairy farms of different scales. The main findings from the table are as follows:

- **Small Farms:** Small farms have the lowest financial profitability and economic profitability ratios among the three scales. Additionally, they have the highest expense-to-income ratio and feed particle efficiency. This indicates that small farms are less profitable and efficient.
- **Medium Farms:** Medium-sized farms have higher financial profitability and economic profitability ratios compared to small farms. They also have a lower expense-to-income ratio and feed particle efficiency. This suggests that medium-sized farms are more profitable and efficient.
- **Large Farms:** Large farms have the highest financial profitability and economic profitability ratios among the three scales. Additionally, they have the lowest

expense-to-income ratio and feed particle efficiency. This indicates that large farms are the most profitable and efficient.

These findings demonstrate that farm scale has a significant impact on profitability and efficiency. Large farms tend to be more profitable and efficient, but each farm scale has its own advantages and disadvantages. For example, while small farms may be more flexible, large farms may have economic scale advantages.



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APPENDIX

1. Survey Questions

NİĞDE İLİ DAMIZLIK SIĞIR YETİŞTİRİCİLERİ BİRLİĞİNE BAĞLI SÜT SIĞIRCILIK İŞLETMELERİNİN EKONOMİK ANALİZİ ÇALIŞMA BİLGİ FORMU

ANKET NO:

ANKET TARİHİ:

Anketörün Adı :

İli :

Köyü :

İşletmenin Merkeze Uzaklığı:

Appendix 1. SURVEY QUESTIONS (Continuation)

A-KİŞİSEL BİLGİLER

1. Çiftçinin Adı Soyadı:

2. Kaç Yaşındasınız:

3. Öğrenim Durumu:

Okuryazar değil	Okuryazar	İlkokul	Ortaokul	Lise	Yüksekokul	Diğer

4. Süt sığircılığı ve/veya hayvancılıkla ilgili katıldığınız eğitici çalışma var mı?

Evet.....

Hayır.....

5. Süt sığircılığı asıl işiniz midir? Evet..... Hayır.....

Cevabınız hayır ise bunun dışındaki faaliyetlerinizi belirtiniz.

6. Aile fertlerinin

a- Sayısı:

b- Süt sığircılığına aktif katılan aile fertlerinin sayısı:

B-İşletmeye Ait Bilgiler

I-İşletmenin Arazi Varlığı (Da)

a-Sulanabilen Arazi Varlığı.....

b-Yem bitkileri

II. İşletmenin yem bitkileri ekimi için ayırdığı arazi (da).....

Yem Bitkisi	Ekili alan (Da)	Hasat sayısı	Verim (da/kg)
Yonca			
Mısır			
Fiğ			
Yulaf			
Korunga			
Diğer (belirtiniz)			

Appendix 1. SURVEY QUESTIONS (Continuation)

III. Hububat için ayrılan arazi (da).....

Yem Bitkisi	Ekili Alan (da)	Verim (da/kg)
Arpa		
Buğday		
Çavdar		
Yulaf		
Diğer		

C- İşletmede Bulunan Binalara Ait Bilgiler

1-Hayvan Barınağı

	Maliyeti (TL)	Havalandırma	Mülk Sahibi	Kira	Ekonomik Ömrü
Beton					
Toprak					

2-Yem Deposu

	Maliyeti (TL)	Havalandırma	Mülk Sahibi	Kira	Ekonomik Ömrü
Beton					
Toprak					

3-Samanlık

	Maliyeti (TL)	Havalandırma	Mülk Sahibi	Kira	Ekonomik Ömrü
Beton					
Toprak					

4-Bakıcı Binası

	Maliyeti (TL)	Havalandırma	Mülk Sahibi	Kira	Ekonomik Ömrü
Beton					
Toprak					

Appendix 1. SURVEY QUESTIONS (Continuation)

5-Diğer.....

	Maliyeti (TL)	Havalandırma	Mülk Sahibi	Kira	Ekonomik Ömrü
Beton					
Toprak					

6-Diğer.....

	Maliyeti (TL)	Havalandırma	Mülk Sahibi	Kira	Ekonomik Ömrü
Beton					
Toprak					

7-İşletmenin Amortismanına Dayalı Alet ve Ekipmanları

Alet ve Ekipmanlar	Satın Alma Fiyatı	Ekonomik Ömrü	Yıllık Amortisman
Yemlikler			
Suluklar			
Sağım makinesi/sistemi			
Traktör			
Diğer alet ve ekipmanlar			

8- İşletmenin sığır varlığı

Sığır Varlığı	Yılbaşı Mevcudu	Fiyatı (Baş/TL)	Yılsonu Mevcudu	Fiyatı (Baş/TL)
İnek				
Boğa				
Erkek buzağı (0-6 ay)				

Dişi buzağı				
Dana (6-12 ay)				
Düve				
Tosun				

Appendix 1. SURVEY QUESTIONS (Continuation)

9-İşletmedeki Hayvan Hareketleri

Dönem İçinde;

	Satılan Hayvan Değeri (TL)	Satın Alınan Hayvan Değeri (TL)	Ölen veya Evde Tüketilen Hayvan Değeri (TL)
İnek			
Boğa			
Erkek buzağı (0-6ay)			
Dişi buzağı			
Düve			
Tosun			
Dana (6-12 ay)			

D- Giderler

a-Yem

1-İşletmede üretilen kesif yem:

- Yıllık üretim miktarı (Ton):
- Üretim maliyeti (Kg/TL):
- Piyasa Fiyatı (Kg/TL):

1- İşletmede üretilen kaba yem:

- Yıllık üretim miktarı (Ton):
- Üretim maliyeti (Kg/TL):
- Piyasa fiyatı (Kg/TL):

2- Satın alınan kesif yem miktarı (Ton)..... Piyasa Fiyatı (Kg/TL)

.....

3- Satın alınan kaba yem miktarı (Ton) Piyasa Fiyatı (Kg/TL)

.....

Appendix 1. SURVEY QUESTIONS (Continuation)

a- İşçilik Giderleri

- Yıllık yabancı işgücü sayısı: Masrafı..... (TL)

b- Veteriner Sağlık Giderleri

Anlaşmalı Veteriner Hekiminiz var mı? Evet: Hayır:

Cevabınız evet ise anlaşma şekli/aylık veya yıllık ücreti

Tedavi TL/Yıl:

Aşılamalar TL/Yıl:

Suni tohumlama TL/Yıl:

İlaçlar TL/Yıl:

Cevabınız hayır ise yıllık veteriner hekim ve sağlık masraflarınız ne kadar?..... TL

c- Bakım-onarım giderleri TL/Yıl

d- İşletmede kullanılan kredilerin (ve şahıslara olan borçlar)

Miktarı:

Kullanım amacı:

Vadesi:

Yıllık faiz oranı:

e- Sigorta Giderleri

Canlı hayvan sigorta giderleri:

Diğer sigorta giderleri:

f- Buzağılara verilen süt miktarı (ton).....

g- Diğer Giderler

Su.....TL

Elektrik.....TL

Appendix 1. SURVEY QUESTIONS (Continuation)

Akaryakıt.....TL

Isınma.....TL

Diğer (belirtiniz).....TL

E- GELİRLER

1. Üretilen süt miktarı(ton).....

2. Yıllık ortalama süt satış fiyatı (kg/TL)

Gübre geliri

İşletmede elde edilen gübre miktarı (Ton/Yıl)

Gübre fiyatı (Ton/TL)

CURRICULUM VITAE

I am Özge Nur FİDAN, I was born on .../...../ ... in Niğde, Turkey. I have bachelors from Hatay Mustafa Kemal University, Hatay, Turkey. I started M.sc in Niğde Ömer Halisdemir University, the Faculty of Agricultural Sciences and Technologies, Department of Animal Productions and Technologies.



