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# Sustainable Livestock Farming in Turkey and Pınarhisar Gene Center Implementations

## *Türkiye’de Sürdürülebilir Hayvancılık ve Pınarhisar Gen Merkezi Uygulamaları*

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### ABSTRACT

Turkey where a wide range of economic activities are carried out, expected levels in animal husbandry activities have not been achieved. Livestock, which is considered like insurance in agriculture; is not sustainable in terms of number, variety, and yield. The policies applied to agricultural activities, lack of education in this field, modern facilities, animal health conditions, and market conditions of the products are the reason for livestock activities not reaching the desired level. In Turkey, many sites have been designated as gene centers for the development of livestock activities. However, the results obtained from these places have always been below the expectations and are far from being applicable. It will be important for both Turkey and Pınarhisar to evaluate the Holstein breed as the gene center of cattle breeding. Economic problems in rural areas mainly stem from the inability to appropriately assess the existing economic potential. It is very important to determine the livestock potential in detail and to determine the strategies for the proper utilization of this potential among the agricultural activities. Thus, with sustainable livestock activities, rural areas in the district will be brought in to the economy.

**Keywords:** Pınarhisar, Livestock Operations, Gene Center

### ÖZ

Ülkemiz bulunduğu konum itibariye doğal ve beşeri özellikleri bakımından dikkat çekmektedir. Çok çeşitli ekonomik faaliyetlerin gerçekleştirildiği ülkemizde, hayvancılık faaliyetlerinde beklenen seviyeye ulaşılmamıştır. Tarımın sigortası olarak görülen hayvancılık; sayısı, çeşidi ve verimi bakımından sürdürülebilir olmaktan uzaktır. Oysaki, ülkemizin her bölgesi çok çeşitli hayvancılık faaliyetlerine olanaklar sağlamaktadır. Tarımsal faaliyetler için uygulanan politikalar, bu alandaki eğitim yetersizliği, modern olmayan tesislerin fazlalığı, hayvan sağlığı şartlarının oluşmaması ve elde edilen ürünlerin pazar koşullarının tam olarak oluşmaması hayvancılık faaliyetlerinin istenilen seviyeye gelmemesine neden olmaktadır. Tarihi eskiye inen ülkemiz, hayvan genetiği bakımından birçok ırkın menşedir. Ülkemizde hayvancılık faaliyetlerinin geliştirilmesi için birçok saha gen merkezi olarak belirlenmiştir. Ancak buralardan alınan sonuçlar her zaman beklentilerin altında kalmış ve uygulanabilir olmaktan uzaklaşmıştır. Çalışma sahasının büyükbaş hayvancılık içinde Holstein ırkının Siyah Alaca çeşidinin gen merkezi olarak daha fazla değerlendirilmesi hem ülkemiz hem de Pınarhisar için önemli olacaktır. İlçenin kırsal alanındaki ekonomik problemler yaygın bir kırsal yoksulluğa yol açmaktadır. Kırsal alanlardaki ekonomik problemler, temelde mevcut ekonomik potansiyelin uygun bir şekilde değerlendirilememesinden kaynaklanmaktadır. İlçenin en önemli geçim kaynağı durumundaki tarımsal faaliyetler içinde hayvancılık potansiyelinin ayrıntılı olarak ortaya konulması ve bu potansiyelin uygun bir şekilde değerlendirilmesine yönelik stratejilerin belirlenmesi son derece önemlidir. Böylece sürdürülebilir hayvancılık faaliyetleriyle ilçedeki kırsal alanların ekonomiye kazandırılması sağlanmış olacaktır.

**Anahtar kelimeler:** Pınarhisar, Hayvancılık Faaliyetleri, Gen Merkezi

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## 1. INTRODUCTION

Livestock farming can be carried out in the form of pasture, fattening-barn and semi-nomadic animal breeding. Stables and fattening in Turkey are mostly done in the southern Marmara and Thrace region and contribute much to the nutrition and economic activities of the country (Doğan, 2016, s. 144). In the main animal husbandry sector where meat, milk, and dairy products are provided as basic nutrients, yield value is of great importance. Therefore, instead of domestic animals with low yield, pure culture animals or culture hybrids formed by mating two different species have been used in an attempt to increase productivity. The Thrace region, which is between the Black Sea in northwestern Turkey, the Aegean, and the Marmara Sea, has approximately 7,000 years settlement history. Thrace has always been in the forefront and opened to settling since natural conditions were suitable and it was on the transit route between Europe and Asia. “Agriculture, on the one hand, meets the raw material needs of industrial plants processing food, tobacco, liquor, sugar, textiles and animal product, despite the rapidly growing population in Turkey, moreover, it meets the nutritional needs” (Sertkaya Dogan, 2008, s. 98). The high amount of flatland and the large area of the alluvial soils have attracted the attention of both the crop production and animal husbandry activities of the study area.

Animal husbandry is one of the oldest cultural activities of mankind and people benefited from animals in various ways for a long time in order to sustain their lives even before animal husbandry was carried out in the cultural sense. People always needed animals in order to benefit from their strength, meat, milk, skin, bones and various aspects that could be increased (Şahin, 2015, s. 15). From past to present, Thrace is also one of the major centers of Turkey in terms of cattle, ovine breeding, and mandate breeding. This area is also an important gene center with native breeds (such as curly sheep, gray cattle breed, Thrace bee). Its proximity to major consumption centers such as Istanbul and the fact that there are still important agricultural areas make both Thrace and Pınarhisar important. It is important to protect the Holstein breed of the Black Pied type as a gene center in the cattle breeding area of the study area. The absence of other animal breeds and varieties from Anatolia to Thrace is valuable for the protection of genes. The emergence of these races and varieties from Thrace to all four sides of Turkey will keep the animal husbandry policy implemented.

Livestock activities in Turkey experienced difficulties in their efficiency - especially in cattle farming - to increase productivity in all activities should be planned and sustainable

work-based gene. “Due to the fact that the genotype structure of cattle is close to culture and culture hybrid in the Thrace region, animals of the region are used as breeding material for other regions of Turkey” (Semerci, 2006, s. 67). Therefore, the structural characteristics of animals in Thrace are of genetic importance. “The origin of culture and hybrid animals in Thrace is predominantly Holstein type breeds (73.8%). Cattle fattening

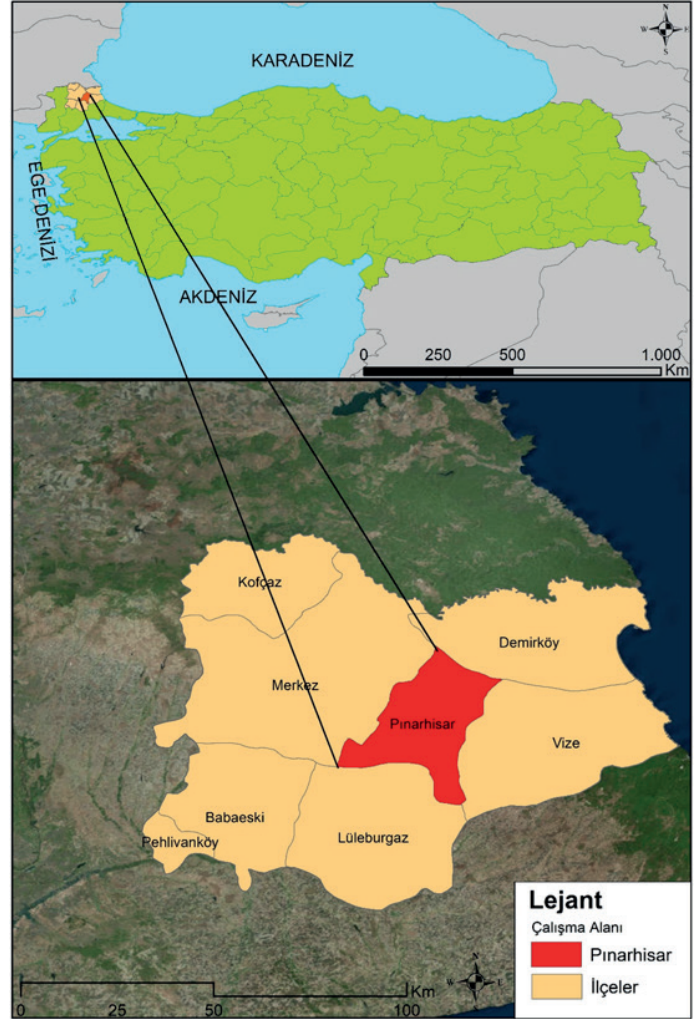


Figure 1: Location Map of the Worksite.



Photo 1: Holstein breed of the Black Pied type.

in the region is mainly directed towards milk production” (Gültekin, 2014, s. 18). Thrace is being made free of foot-and-mouth disease, while studies on other diseases in animals are continuing. Thrace and therefore Pınarhisar is a gene center in this region.

The province of Kırklareli has a total of 464,512 animals, 320,940 ovines and 143,592 cattle (2017). Although the presence of ovines in the province is higher than the presence of cattle, it is noteworthy that the yield obtained is higher than that of cattle due to the availability of the natural structure of the province. In the same year, Pınarhisar has a total of 47,661 animals, 40,936 cattle and 6,725 ovine. The topographic features of the study area are different from the province in general. Despite this, both animal husbandry and crop production activities have not reached the required level.

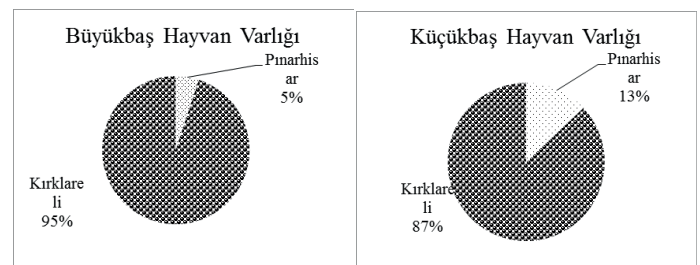
Pınarhisar, which dates back to ancient times, was founded in the central part of Kırklareli Province and in the foothills of the Strandja Mountains. Although Pınarhisar draws attention with its water resources, the Istranca Mountains in the north cut off the sea effect, it has an effect on the terrestrial climate of the region and has limited crop production. It will be beneficial to consider the Pınarhisar District, which stands out with its livestock activities, as a genetic center in the field of livestock in the Thrace Region.

“The most trouble hosting industry in terms of structure and characteristics of rural economic activities in Turkey is without a doubt the agricultural sector” (Coppersmith, 2007, s. 323). Chronic problems in the agricultural activities of Turkey show the effects both in the studying area and its environment. These problems are clearly seen in animal husbandry within agricultural activities. Industrial activities, which started about 50 years ago but increased in the last 30 years, migration from rural to urban areas, environmental pollution, rising input prices, the inadequacy of applied agricultural policies and the shifting of the new generation to other occupations also affected the livestock activities negatively. Due to the increasing input prices, both in Turkey and Thrace and Pınarhisar, the expected gains, especially in milk, dairy products, and meat, were not achieved and the livestock activities started to decline. In addition, the fact that animal husbandry activities are always behind plant production has caused Turkey and Pınarhisar animal husbandry not to develop. In addition, important and valuable activities such as mandate have been negatively affected and there has been a significant decrease in the production of mandate and its products.

### 1.1. Pınarhisar’s Place in Livestock Activities in Kırklareli Province

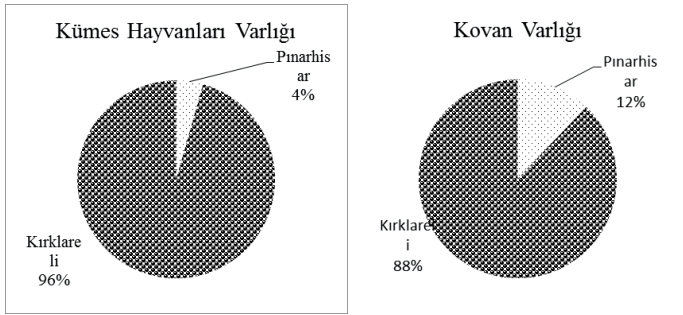
Pınarhisar, which has a wide plain, could not come to the forefront in terms of economic development due to dry agricultural practices. Since the surrounding industrial areas are centers of attraction for young people, both crop production and animal husbandry activities have not developed sufficiently. Connecting the young population to their lands with irrigated farming methods will be valuable especially as it will highlight the agricultural potential and pave the way for investments in the food industry accordingly. Pınarhisar, which is one of the 8 districts of Kırklareli, has not reached the desired level in terms of livestock activities in general. In Pınarhisar, which has favorable conditions in terms of proximity to a megacity like Istanbul, natural and human characteristics, some families do livestock activities as a second job to earn additional income, some families, especially in the northern parts of the district due to the rugged terrain and inefficient agricultural land for crop production, do this job as the main source of livelihood” (Cidan, 2016, s. 83). Despite the large plains in the study area, wheat and sunflowers are grown due to dry farming activities. Vegetable crop variety will increase when the irrigation shortage has eliminated the yield and consequently income will also increase. Although the animal husbandry activities in Pınarhisar are carried out on a large scale and in small family enterprises, the quality of meat and meat products is very high due to the feeding of animals in more natural environments” (Thrace Development Agency, 2012). However, “in order to develop intensive livestock in the region, the farmer should be introduced to new techniques and technologies and informed” (Balçı Akova, 2002, s. 38). Pınarhisar, which is relatively better in terms of ovine livestock, is one of the leading districts of Kırklareli in terms of beekeeping. There is no aquaculture activity in the district, which does not have a seashore, and there are no other animal husbandry activities such as silkworm.

As shown in **Figure 2**; In 2017, the Pınarhisar district attracts attention with a rate of 18% in cattle and ovine livestock activities



**Figure 2:** The Distribution of Cattle and Ovine Animals in Pınarhisar by Province in 2017. Source: TUIK, 2019.





**Figure 3:** Ratio of Poultry and Hive Presence in Pınarhisar by Province in 2017. Source: TUIK, 2019.

in Kırklareli Province. 5% of this ratio is cattle and 13% is sheep and goat breeding. In the ovine activity, breeding of sheep and, to a certain extent, hair goat attracts attention.

In 2017, the ratio of poultry activities of the district in Kırklareli province was 4.4%. This ratio shows that poultry farming is underdeveloped (Figure 3). Almost all of this ratio is made up of chicken (egg hen) breeding. In Pınarhisar, there is a maximum of 22,526 chicken eggs from poultry, there is no meat breeding in the district. The presence of other poultry (duck, goose, and turkey) is also much more limited (541 heads). In apiculture (which is the only livestock branch in which the district is in first place), the province has a share of 12.1% in total hive assets (Figure 3). In 2017, out of a total of 6,010 hives, 500 of them were old-style barrels. Considering the factors that have recently experienced a rapid transformation in agricultural activities (such as GMO crops, organic farming, domestic seed use and proximity to Istanbul, etc.), it is noteworthy that the Pınarhisar district is far behind the expectations due to the animal husbandry potential. As a matter of fact, there should be a chance for the Pınarhisar district with the changes and developments in the surrounding agricultural centers.

## 1.2. Base Lines of Livestock Activities in the Pınarhisar District

As mentioned before, in Pınarhisar (which lags behind the livestock potential of Kırklareli Province), apart from the presence of sheep and beekeeping, there has been no significant improvement in any of the other livestock branches.

As shown in Table 1 prepared according to the selected years; cattle and ovine livestock activities in the district did not come to the fore much. In the district where there is almost no domestic cattle and mandate, it is seen that culture breed cattle breeding has developed relatively. In the presence of these

animals, it is not possible to talk about a steady development trend in recent years due to the chronic problems of animal husbandry (such as instability in milk prices, increase in other input costs, especially feed). For ovine livestock breeding - as detailed in the following sections - there has been a stable development in the district.

### 1.2.1. Cattle Breeding

In general, the cattle breeding activities, which are not very important in the district, the culture race, which was 3,549 head in 2005, increased by 78% in the past 12 years and reached 6,312. On the other hand, the presence of cross-breed cattle experienced a significant decrease in the same period. In 2005, the number of crossbreed cattle, which was 3,815, decreased to 407. This is a significant concern. The total number of bovine animals declined from 7.367 to 6.725 in the 2005-2017 period (Table 1).

**Table 1:** Presence of Cattle and Ovine in Pınarhisar by Selected Years

Animal Presence	2005	2010	2017
Cattle (Culture)	3.549	8.377	6.312
Cattle (Hybrid)	3.815	-	407
Cattle (Local)	-	-	3
Mandate	-	-	3
Sheep (Merino Sheep)	-	-	1.594
Sheep (Local)	17.200	22.100	25.352
Hair Goat	8.000	10.500	13.990

Source: TUIK, 2019.

As of 2017, there were 607 enterprises in the district and in the same year, the number of cattle was 7.506. The presence of cattle per enterprise is 12.4. Pınarhisar has 1 large-scale meat combination. The total meadow-pasture area of the district is 17,740 Dakar and there is no feed factory. In this context, it is seen that the general character of bovine animal husbandry is at subsistence level.

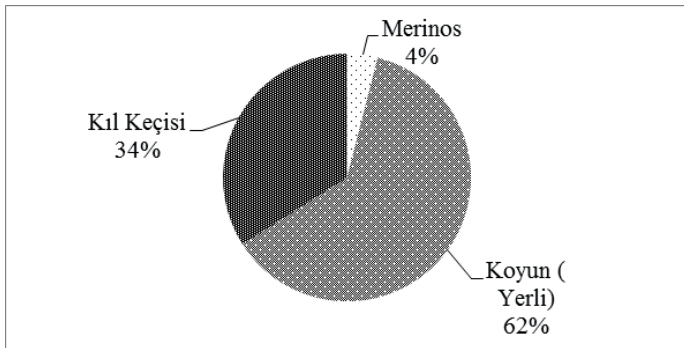
Among the bovine animals, 2,953 of 6,312 breeds of culture breed cattle were milked in 2017 and 68 of 407 hybrid breeds were milked (TUIK, 2019). In 2017, a total of 11,731 tons of milk was produced in the district. Almost all milk production (11,538 tons) was obtained from culture breed cattle. Milk produced in connection with cattle breeding has a parallel development with the presence of animals. Although milk production has increased in the district since the second half of the 2000s, it has been observed that although it has not decreased below 10 thousand tons in recent years, there has still been a

small scale decline. In 2010, the milk production from cattle (3,373 heads) was 13,178 tons. In 2017, the number of milked cattle declined (2,953) and the amount of milk obtained decreased to 11,731 tons (TUIK, 2019).

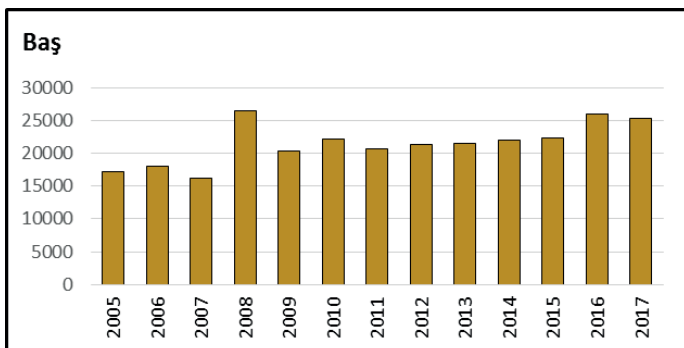
### 1.2.2. Ovine Breeding

Since the past, sheep has been one of the most bred animals in Thrace. Especially in Thrace conditions, domestic breeding of sheep has been the most important livestock activity (Taşlıgil, 2010, s. 166). Ovine breeding activities conducted in the district generally stand out because of curly sheep which are widely bred under Thrace conditions.

In 2017, among ovine animals, local sheep had a share of 62% and hair goat had a share of 34% (Figure 4). For the first time in Pınarhisar, merino sheep breeding was the subject of statistics, and in the same year, 1,594 sheep were observed in the district (TUIK, 2019). Considering the presence of sheep (that forms the basis of ovine breeding in Pınarhisar) it is seen that there has been a development that we can call stable in this field over the years (Figure 5).



**Figure 4:** Proportional Values of Ovine Animals in Pınarhisar by 2017. Source: TUIK, 2019.



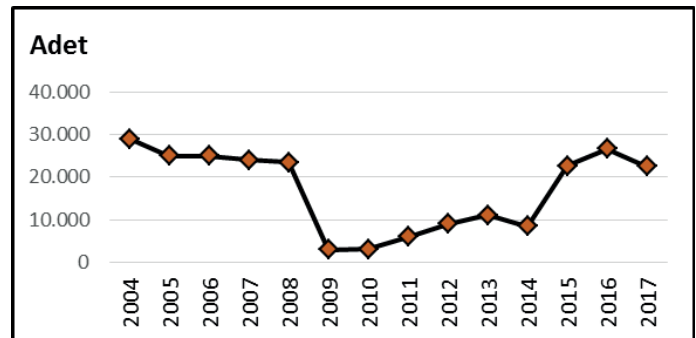
**Figure 5:** Change of Sheep (Domestic) Presence in Pınarhisar Between 2005 and 2017. Source: TUIK, 2019.

The number of sheep in the district in 2005 was 17,200, which increased to 22,100 in 2010 and to 25,352 in 2017. In the last 12 years, the number of sheep has increased by 47.5%. In sheep and goat breeding in Pınarhisar district, there are goat species besides domestic goat breeds. In the district, there were 13,990 hair goats and 1,594 heads of merino in 2017 (Figure 5).

### 1.2.3. Presence of Poultry

The said activity in the district is mainly carried out in the area of laying hens. In 2017, 97.6% of the 23,067 poultry animals consisted of laying hens followed by duck (257), turkey (157) and goose (127), respectively. It is seen that turkeys, ducks, and especially geese, do not have much commercial value. In Pınarhisar, which does not have broiler breeding, there is one modern farm that stands out in egg poultry farming. Pınarhisar ranks last in Kırklareli with Vize and Kofçaz in terms of this branch of animal husbandry.

Looking at the development of the egg hen (which has been the most important element of poultry in the district for the last 14 years), a remarkable change can be seen (Figure 6). Between 2004 and 2008, the average number of chicken in the district was around 25,000, in 2009 this decreased to 3,000 and the lowest value in recent years was recorded with this value. In this case, because of Avian Flu (H5N1), this situation was experienced in the same period across all of Turkey.



**Figure 6:** Changes in the Presence of Chicken (Ovulation) in Pınarhisar (2004-2017). Source: TUIK, 2019.

Thousands of poultry were killed due to the effect of the virus in question. With the decrease in the prevalence of the virus, an improvement has been achieved in Pınarhisar in this area and the number of chickens has reached its old values today. Although the number of laying hens was 26,608 in 2016, it decreased by 22,526 in 2017 (TUIK, 2019).

### 1.2.4. Beekeeping

Pınarhisar is one of the leading districts of Kırklareli in beekeeping, although it is at the back in many branches of animal husbandry. In Kırklareli, it had a 12.1% share with a total of 6,010 beehives in 2017. The number of hives both old and new has increased over the years and significant increases have been observed in honey production.

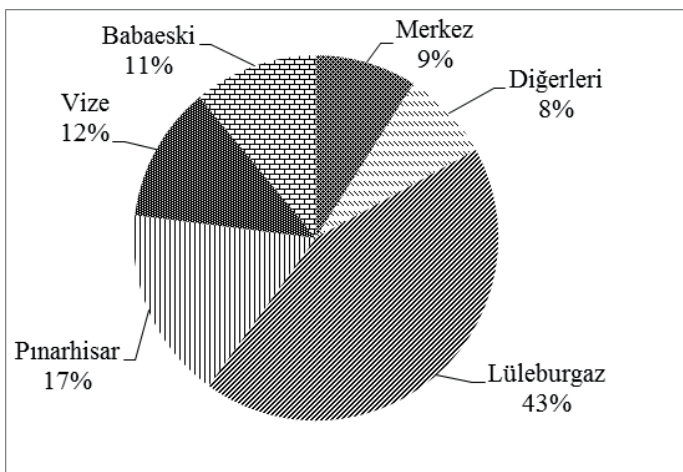
In 2005, 56.3 tons of honey were produced from 2,870 hives, 420 of which were old and 2,450 new. In 2010, a total of 63.4 tons from 3,733 hives, including 300 old and 3,433 new and in 2017, 120.2 tons of honey were produced from 6,010 hives, 500 old and 5510 new. Between 2005 and 2017, the number of hives increased by 110% in the last period, while the total honey obtained increased by 113% at the same rate (Table 2). Wax production was in the range of 3-4 tons according to the data of selected years.

**Table 2:** Values for Beekeeping Activities in Pınarhisar by Selected Years

Year	Hives Presence		Number of Businesses	Honey Production Ton	Wax Production
	Old Hives	New Hives			
2005	420	2.450	15	56.3	3.4
2010	300	3.433	15	63.4	4.2
2017	500	5.510	81	120.2	3.6

Source: TUIK, 2019.

Pınarhisar district, which provided 17% of the total production of Kırklareli province with a total of 120.2 tons of honey production in 2017, ranks second after Lüleburgaz (Figure 7). There are 81 enterprises registered to the Beekeeping



**Figure 7:** Proportional Distribution of Districts of Kırklareli Province in Honey Production as of 2017. Source: TUIK, 2019.

Registry System in the district and all 6,010 hives benefited from the support. In general, beekeeping activities carried out in Lüleburgaz, Pınarhisar and Vize districts are carried out in parallel with sunflower cultivation and accordingly, it makes an important contribution to the economy of the field.

### 1.2.5. Other Livestock Branches

When we look at the presence of single shank in Pınarhisar, it is seen that the number of horses, mules, and donkeys has decreased year by year. As a result of mechanization in agriculture and the decrease in the need for animal power from year to year, there were 128 donkeys, 51 horses, and only 18 mules as of 2017 (TUIK, 2019). Part of the horse presence in Thrace is raised as racehorse. For this purpose, horse breeding is carried out in Kırklareli and Tekirdağ. In Pınarhisar, the presence of 51 horses equals only 8.5% of Kırklareli.

As in different areas of Thrace, it is known that the presence of single shank animals in Pınarhisar district has decreased year by year. In the period from 2005 to 2017, it is observed that the presence of single shank animals and horse and mule assets, especially donkey, decreased (Table 3). In Pınarhisar, where there is no silkworm and fishing activity, two plants have been tested for worm manure production but no success has been achieved.

**Table 3:** Presence of Single Shanks in Pınarhisar by Selected Years

Single Shank Animal Presence	2005	2010	2017
Horse	128	66	51
Mule	48	34	18
Donkey	170	155	123

Source: TUIK, 2019.

## 2. CONCLUSION

Since Pınarhisar hasn't been able to fully reflect its position in economic activities, it has not made much progress. Although it has conditions that can easily market its products due to agricultural production, it has not reached the expected level.

For Pınarhisar, sheep breeding and beekeeping are among the main branches of animal husbandry. Other animal husbandry activities are carried out for the needs of the producers in order to earn a large subsistence in small family enterprises. Although it has a significant presence in sheep breeding, it is seen that its share is still small when compared to the general province of Kırklareli.

Pınarhisar's most developed animal husbandry branch is beekeeping. With the increasing number of beehives and the significant increases in honey production related to this, it attracts attention in this sense.

However, collective bee deaths from time to time reached alarming levels in various parts of the world. This situation is also a problem here and the producer has difficulties.

Pınarhisar's proximity to a major consumption center such as Istanbul, its convenient location in terms of transportation, topography, etc. properties should be evaluated very well. The district may provide a great advantage in terms of the marketing of both raw and processed products to the extent of developing agricultural conditions. In this respect, it is very important that Pınarhisar's livestock activities and related animal products are directly supported by the market of Istanbul and other big centers and the producer is assured in this direction.

Consideration of the highly productive culture and hybrid breeds both in Pınarhisar and Thrace, in accordance with their structure, nutrition and health conditions must be provided.

Pınarhisar will make more contributions to the economy of the region and the country as livestock activities will increase productivity, quality and hygiene conditions as it will enable the jobs to be carried out under intensive conditions.

The milk and other products obtained by the dairies and enterprises to be paid for their labor will increase the income of the families. The fact that livestock activities are carried out on large farms with strong legal incentives and investments with a control mechanism in order to take them out of family businesses will contribute to both Pınarhisar's and the national economy.

Thus, livelihood activities of subsistence cattle, ovine, poultry, single shank, and standing out beekeeping should be transformed into a major economic activity.

Kırklareli and its surroundings, where Pınarhisar district is connected, is an important destination with different tourism opportunities. Within the framework of the relationship between tourism and other economic activities, animal husbandry should be considered and evaluated in a way that will contribute to Pınarhisar and its environment as a very important element.

Developing planned and programmed sustainable policies should be a priority in order to increase the efficiency and quality

of livestock activities. In this context, the protection of Pınarhisar as a gene center in the field of animal husbandry within the Thrace region will be extremely beneficial.

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