

Milk composition characteristics of domestic yellow breed cows in the village herd

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Abstract. Türkiye is considered one of the most important gene centers in the world. Archaeological evidence and studies conducted to date show that cattle, sheep and goats were domesticated in Anatolia and its immediate surroundings. Since a detailed census based on the breeds and their characteristics of these species cannot be made today, no precise information can be obtained about the current status of the breeds. The skin color of the local yellow cows raised in the region was used, ranging from almost black brown and dirty yellow to red and cinnamon. It has been determined that they are small-bodied and have short horns. The rump is higher than the withers, and the back line is also seen to be straight. Horn color is dark black. The area around the eyes, sides of the face, neck, shoulder blades and shaped tip are darker. The tip of the nose is dark to black, and around the nose and mouth there is a slightly lighter-colored, sometimes off-white ring depending on the areas. The inner sides of the sections are light colored. Nail color is dark gray or black, close to black. The average dry matter of domestic yellow breed cattle was determined as 11.67, SNF 9.64, fat 2.15 and protein 3.53. However, it is understood that there is a significant deviation in the minimum and maximum values.

1 Introduction

In the United Nations Convention on Biodiversity, genetic resources are classified as "genetic material that has value for the present or the future." In order to meet the basic needs of people, approximately 40 of the 50,000 mammals and birds known in the world have been domesticated and 7616 farm animal breeds belonging to these species are accepted as genetic resources. Türkiye is considered one of the most important regions of the world. Archaeological evidence shows that sheep, cattle and goats were domesticated in or very close to Anatolia. Today, since there is no detailed census of the races belonging to these species, it is not possible to reach a definitive conclusion about the emergence of the races.

According to 2022 TÜİK data, our total cattle asset is 16,851,956 head. Of this, 49.23% (8,265,825 head) is cultured breed, 43.46% (7,324,866 head) is cultured hybrid, and 7.31% (1,231,365 head) is local breed.

However, it is known that there have been serious losses in farm animal genetic resources in our country over the last half century. Türkiye ranks ninth in the European continent in terms of biodiversity with its geographical regions, climate characteristics, flora and fauna features. Genetic diversity is referred to as biochemical packages that determine the physical and biochemical characteristics of heredity and existence [1]. Local breeds are important genetic resources that have adapted to harsh conditions and are grazed extensively in traditional breeding, in barns in the winter and freely in

the plateaus in the summer [2]. However, as in many parts of the world, there are races in Türkiye whose genes are under threat of extinction [3]. Today, many cattle breeds or types have become extinct [4]. The conservation of animal genetic resources in Türkiye started in 1980 with the protection of four cattle breeds that were at high risk of extinction. Today, 17 breeds or lines from 8 species are protected at the ministry level. Currently, Gray breed, Native Black, Native Southern Yellow, Eastern Anatolian Red, Kilis (South Anatolian Red) breed and Zavot Cattle are under protection. Breed identification criteria are based on written historical records and anecdotal historical evidence, body measurements, conformational morphological evidence, and biochemical evidence such as genetic distance and degree of homozygosity compared to other breeds [5].

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Table 1. Current Status of Turkiye's Native Cattle Breeds and Types [12].

Race - Type	Under threat	Extinct
Native Black	X	
Boz	X	
DAK	X	
Kilis cattle	X	
YGS	X	
Zavot	X	
Halep cattle		X
Cukurova cattle		X
Dörtyol cattle		X
Kırım cattle		X
Kıbrıs cattle		X
Seferhisar cattle		X
Kafkasya cattle		X
Malakan cattle		X
Diyarbakir cattle		X
Karacadağ cattle		X
Urga cattle		X
Kalmuk cattle		X
Eleşkirt cattle		X
Karaisalı cattle		X

Protecting genetic resources; It requires knowledge, expense, space, workforce and organizational skills. On the other hand, there are economic, scientific, cultural and ecological reasons for protecting genetic resources [6]. Although studies have been conducted on the Kilis breed among Southern Anatolian Red cattle, there is very little information about the Native Southern Yellow cattle (YGS).

Gene resources are important for the development of living things because they contain genes that provide resistance to different conditions. Any information about the breeds containing these genes is extremely important for breeding studies. The yet unknown properties of genetic resources are of critical importance in the negativities caused by world population growth, climatic changes, industrialization and urbanization. For these reasons, information on the characteristics of native breeds is needed.

Turkiye is one of the most important gene centers in the world. However, today many genetic resources are under protection due to the threat of loss. It is estimated that these genetic losses will negatively affect world agriculture in the near future. For this reason, in recent years, there has been a significant increase in studies and efforts to protect animal genetic resources in the world. Taking this need into consideration, it was aimed to reveal the morphological characteristics and milk components of the local yellow breed, which has adapted to harsh conditions and still contributes to its breeders by grazing extensively in traditional breeding, in barns in winter and freely in the plateaus in summer.

2 Material and method

The research was conducted in 2018 in Gürümze village, Feke District, Adana Province, where Native South Yellow cows registered within the scope of the Domestic

Animal Genetic Resources Protection Project are located. Feke District of Adana Province is 122 km away from Adana and is 620 m above sea level. Winters in Feke are rainy (snow and rain), summers are semi-arid and cool. It is 0-10 degrees in winter, 30-40 degrees in summer in the district center, and 15-20 degrees in plateaus and village areas.

For the study, business visits were made together with the technical staff of the Metropolitan Municipality, morphological features were observed and milk samples were taken. In the study, milk samples were taken from 8 head of YGS registered within the scope of the Domestic Animal Genetic Resources Protection Project, cared for by 3 neighboring breeders. Milk samples were taken by the owners of the animals who milked them during the winter months when the animals were cared for at home after returning from the pasture. The samples taken were preserved in the cold chain and transported to the laboratory where the analyzes were performed. In the study, milk samples were taken twice from 8 head of YGS while they were kept in the barn. MilkoScan FT120 (FOSS) milk analyzer measured dry matter (DM), non-fat dry matter (FDM), fat, protein, casein, lactose, urea nitrogen (urea). -N), density, acidity, free fatty acids, citric acid and freezing point were determined.

SPSS statistical package program was used to evaluate the data obtained in the research. To define herd milk composition values, mean, standard error and standard deviation, minimum, maximum and median values were calculated.

3 Results and discussion

3.1 Growing conditions

In the region, Native Southern Yellow Cattle is mostly raised in the form of extensive breeding, which we can call traditional breeding. The distribution areas of the native Sarı race within the borders of Turkiye are the provinces from Mersin to Hatay and Şanlıurfa, the regions between the Taurus and Amonos Mountains and the Mediterranean, and partly the north and northeast of these mountains [7].



Fig. 1. Distribution areas of the native Yellow race within the borders of Turkiye [7].

It is commonly raised in village herds (Figure 1) under primitive care, feeding and housing conditions. The herds are sent to the mountains for grazing in April and May, and they stay in the mountains for 6-7 months without human intervention, returning to the village with the

snowfall [7]. The herds are housed in barns in the winter and raised on pasture in the summer. The animals in the village between November and April are kept in the barns of the enterprise, which are generally located under the houses at night, and are spread in the pastures and pastures around the village during the day. However, on days when the weather is good, they are released into nearby forest areas and the animals return home in the evening. The heat of the animals in the barns under the houses contributes to the heating of the house.



Fig. 2. A view from the village herd.

Although it depends on the weather conditions, the animals are taken to the village plateau in late April and early May. Animals that graze freely in the pasture with their calves are not fed additionally. Animals that give birth at the beginning of September are taken to the barns, and when the first snow falls, they are grazed around the village during the day and kept in the barns at night in October and November. It is capable of grazing on rugged terrain and has adapted to mountainous regions. It can climb mountains like a goat. It is resistant to diseases and resistant to bad environmental conditions. Maternal instinct is developed. When she doesn't see her calf, she doesn't give milk.



Fig. 3. Adana Province Feke District Native Southern Yellow breed returning home.

3.2 Morphological features

The skin color is brown, almost black. It is a small-bodied, short-horned cattle breed. The rump height is higher than the withers. The back line is straight. Color varies from dirty yellow to red and cinnamon. Horn color is dark black. Around the eyes, sides of the face, neck, shoulder blades and tail tip are darker. The tip of the nose is dark, ranging from black to black, and there is a slightly lighter-colored, sometimes off-white ring around the nose and mouth compared to the body. The inner sides of the legs are light colored. Nail color is dark gray or black, close to black.

A study reported that the type described as Dörtüyl, where there is no Çukurova type, is not a local indigenous breed but the Yellow cattle bred in the region, and it was

reported that Southern Anatolian Red cattle can be examined as 3 types, Local Southern Yellow, Kilis, Aleppo-Damascus type. However, the Aleppo-Damascus type will be excluded due to the fact that the numbers are too small to be considered and cannot be distinguished. Among the Southern Anatolian Red cattle (GAK), the Kilis breed stands out with its high milk yield, while the YGS stands out with its heat resistance, pasture ability and hoof strength. He states that Kilis cattle come from the same root, but that they are a local primitive cattle that have been bred for work efficiency for a long time, and the same type of local primitive cattle is bred in Egypt under the name 'Beladi' [8]. Argues that Kilis cattle should be considered as separate breeds and should not be seen as a type under the name of "South Yellow Red cattle" with YGSs [9].

In a study conducted on GAK and YGS cattle, the general averages (\pm SH) of body length, withers height, rump height and chest depth of GAK cattle were 141.37 ± 1.26 cm, 123.22 ± 1.06 cm, 128.38 ± 1 cm, respectively. While 113 cm and 64.06 ± 0.53 cm, these features in YGS cows are as follows, respectively. It was determined as 119.29 ± 0.84 cm, 103.29 ± 0.68 cm, 105.70 ± 0.79 cm and 55.63 ± 0.39 cm. It was revealed that there was a statistically significant difference between cattle species in terms of these examined characteristics ($P<0.01$). The researcher reports that these cattle, which are generally evaluated under the same breed name, are two different breeds [10].

YGS are defined as small-bodied breeds with a birth weight of 12-14 kg and an adult weight varying between 150-250 kg, with a withers height of 105-115 cm. It is also reported that there is a lactation milk yield of 1500-2500 kg with 3.5-4.5% fat in an average lactation period of 200-250 days [11].



Fig. 4. YGS height at withers.



Fig. 5. GAK height at withers.

3.3. Milk composition

Within the scope of the study, the analysis results of milk samples from a total of 8 heads of Native Yellow breed cows are summarized in Table 1. In this study, the average total solids of Native yellow breed cattle was determined as 11.67, SNF 9.64, fat 2.15 and protein 3.52. However, when looking at the minimum and maximum values column, it becomes clear that there is significant variation.

Table 2. Descriptive statistics of milk analysis results of YGS.

Milk content	Average	Standard error	Standard deviation	Min.	Max.
TS	11.67	0.28	0.80	10.65	13.36
SNF	9.64	0.07	0.20	9.37	9.92
Fat	2.15	0.28	0.78	1.23	3.65
Protein	3.53	0.08	0.23	3.11	3.79
Lactose	5.21	0.06	0.16	4.97	5.40
Casein	2.96	0.06	0.17	2.67	3.22
Urea	0.02	0.00	0.01	0.02	0.04
Density	1036.35	0.51	1.44	1034.40	1038.68
Acidity	6.94	0.23	0.65	5.63	7.54
FFA	1.24	0.29	0.83	-0.39	2.06
CitrAci	0.14	0.01	0.03	0.11	0.19
FPD	0.58	0.01	0.02	0.55	0.59

4 Conclusion

Since local breeds adapt to all kinds of environmental conditions (geographical conditions, climatic conditions, feed resources, diseases) of the regions they live in, they are resistant to the diseases of the region and are able to utilize the inefficient feed resources in the region. Türkiye native cattle breeds have been in danger of extinction due to crossbreeding with cultured breeds for a long time, and their pure genotypes have begun to disappear. With the changing selection criteria around the world in animal breeding, domestic and even local gene resources have increased their importance. It is thought that it is necessary to create some phenotype data (milk/meat yield, feed utilization, disease resistance, etc.) of YGS, which are bred under fully extensive conditions, and an expanded breeding program, not just protection herds.

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