International Journal of DAGENE

Danubian Animal Genetic Resources

Volume 7, Issue 2 (2022)

DAGENE
International Association for the Conservation
of Animal Breeds in the Danube Region
1078 Budapest, István street 2.
Hungary

Biodiversity of sheep population in Vojvodina - Serbia

GRBA, Jovana – DRAGIN, Saša – PIHLER, Ivan, – KUČEVIĆ, Denis – ČOBANOVIĆ, Ksenija – BJEDOV, Siniša

University of Novi Sad, Faculty of Agriculture, Republic of Serbia 21000, Novi Sad, Trg Dositeja Obradovića 8
*corresponding author: jovana.grba.94@gmail.com

Abstract

On the territory of AP Vojvodina, there are several autochthonous breeds of sheep: Tsigai, Chokan Tsigai, Horn-twisted Zuja and various strains of Pramenka. The creation of autochthonous races was influenced by specific climatic factors, so they are adapted to bad environmental conditions and are characterized by good resistance to diseases and a long lifespan. Productivity of autochthonous breeds is low, and they are suppressed in modern production that leads to a reduction in genetic variability. In this study, we explored how the racial composition and number of sheep in the area of Vojvodina changed in the period from 2010 to 2020. Data were collected and processed within main breeding organization of the Department of Animal Husbandry of the Faculty of Agriculture in Novi Sad, Serbia. The research included all sheep that are registered and whose records are kept. Based on the analysis, of sheep number by breed, an assessment of the current state, as well as the prospects for preservation and development of autochthonous sheep breeds were given. The population of Tsigai in the period of 2010 was 1757 animals, while in 2020 it was recorded at 5161 individuals. The population of Chokan Tsigai in the period of 2010 was 351, while in 2020 it was recorded at 2092 sheep. The population of Horn-twisted Zuja in 2010 was 145, while in 2020 there were 1056 sheep of that breed.

Keywords: biodiversity, sheep, autochthonous, Vojvodina region

Introduction

Process of degradation of natural habitats is very pronounced through various types of human activities (RADOVIĆ and PETROV, 2001). In recent decades, almost all domestic animals have experienced a significant reduction in genetic diversity (STANČIĆ and STANČIĆ, 2013). Preservation of biodiversity in domestic animals is in the interest for the world community survival (PRENTICE and ANZAR, 2011). Biodiversity conservation is a process of genetic conservation through the restoration of degraded ecosystems and natural habitats with autochthonous animal breeds (STANIVUK et al., 2017). Sheep breeds are mainly bred in economically underdeveloped regions with modest food sources (ŽUJOVIĆ et al., 2011). These genotypes are an important element of regional agro-biodiversity with impact on agro-ecosystems that determine the cultural heritage of a given region (JOVANOVIĆ et al., 2011). The analysis of autochthones breeds population size, in the Republic of Serbia, shows that

many of them are endangered and may disappear (STOJANOVIĆ, 2003). The structure and racial composition of sheep on the territory of AP Vojvodina is quite diverse. Expert report of the work performed in order to control the implementation of breeding programs in AP Vojvodina in 2020 shows greater interest of people in sheep breeding.
Autochthonous sheep breeds differ in their characteristics, but with the help of new technologies, the animal population is characterized in an appropriate way, both phenotypic and genotypic (DRAGIN et al., 2016). Preservation of indigenous breeds both in situ or ex situ would preserve gene pool, gene variability and biodiversity (DRAGIN et al., 2017).

Material and methods

According to the data of the Republic Bureau of Statistics, on the territory of AP Vojvodina for 2020, 286000 sheep of all breeds and categories are bred at the moment. 15 different breeds of sheep are entered into the Main Registry Book of sheep for the territory of Vojvodina (Table 1). According to the data of the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia, the genetic resources of endangered autochthonous breeds of sheep, bred on the territory of Serbia, include three breeds of sheep: Chokan Tsigai, Horn-twisted Zuja and Pramenka with different strains. In this research, we collected and processed data from the main breeding organization of the Department of Animal Husbandry of the Faculty of Agriculture in Novi Sad, Serbia, on the racial composition of registered sheep herd in the territory of AP Vojvodina in the period from 2010 to 2020.

Results and discussion

Table 1 show that there is a slight increase in the stock of sheep in the period from 2010 to 2020 in the territory of Vojvodina. The number of sheep sheds increased from 13034 in 2010 to 167426 in 2020. Such a rapid increase in the number of heads in the breeding stock of sheep in AP Vojvodina is primarily a consequence of the state's subsidy policy. In 2010, there were 5.11% of sheep in the breeding stock of sheep of AP Vojvodina, out of the total number of sheep in AP Vojvodina, while in 2020 there were 51.69% of sheep in the breeding stock (Expert report and results of performed tasks of control of breeding programs in AP Vojvodina for 2020).

A continuous increase in the breeding stock is observed in the noble breeds of sheep, especially if we observe the two dominant breeds in this area, Württemberg and Ile d'France. The autochthonous breeds of Tsigai sheep, Chokan Tsigai and Horn-twisted Zuja, in the observed period, had oscillations in their number. The reason is the subsidy policy of the state and the fact that AP Vojvodina is a region with extremely intensive agricultural production suitable for stable system of sheep keeping, so farmers more often decided to breed noble breeds. Indigenous breeds of sheep have found their profitability through the exploitation of the few remaining natural pastures in AP Vojvodina.

Table 1. Population of registered sheep on the territory of Vojvodina in the period from 2010 to 2020

Breed	2010	2012	2014	2016	2018	2020
Bergamo sheep	111	351	599	1301	3209	2334
Tsigai	1757	1367	2054	3167	5580	5161
Chokan tsigai	351	632	632	346	1098	2092
Il de france	1681	2256	6614	10094	28455	44183
Suffolk	28	58	186	318	1210	1716
Charole	10	51	92	312	364	341
Texel	0	33	67	95	175	171
Racka sheep	145	219	288	62	331	1056
Vurttemberg	8951	11980	2143	31971	74460	10270
British milk sheep			33	327	206	121
Romanov				291	2135	5188
German Blackheaded						43
Pramenka					133	1860
German meatmerino						182
Lacon						269

In Figure 1, we can notice that the largest part of the sheep population in the territory of Vojvodina in 2020 consists of two noble breeds of combined abilities, Vurttemberg, with 61%, and Ile d'France, with 26% representation. While all other breeds occupy only 13% of the total sheep population.

Indigenous sheep breeds in AP Vojvodina make up less than 5% of the total sheep stock. At the selection review in 2020, 8309 sheep were recorded. The most represented breed was Tsigai, which had 5161 registered individuals. The incentive of the Ministry of Agriculture, Forestry and Water Management affects the number of registered breeding animals because funds are allocated to breeders for the preservation of genetic resources, regardless of whether they are registered in the Main register or not. Given that sheep breeding in Serbia is mainly based on

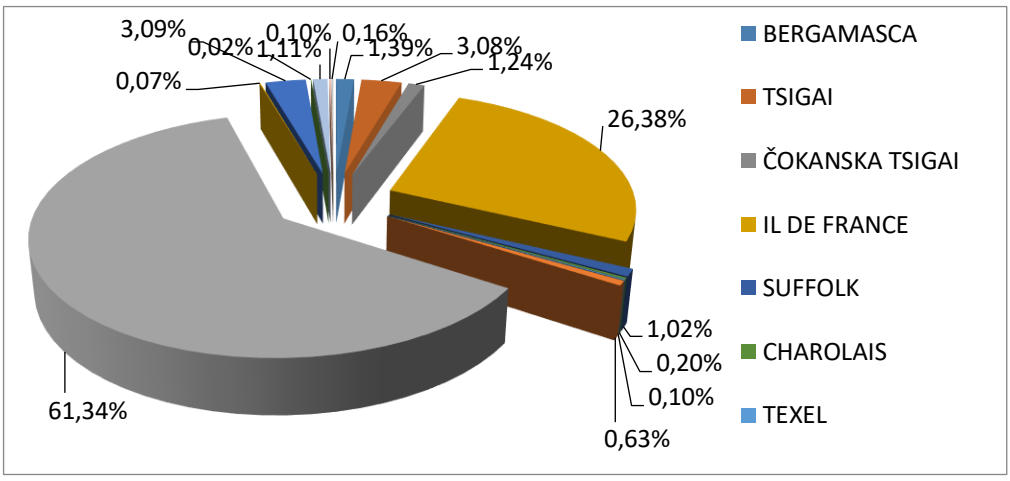

Figure 1. Schematic representation of the racial structure of sheep on the territory of Vojvodina in 2020

meat production, the breed structure does not support this. Sheep breeds selected for meat production, such as Suffolk, Charolais and Texel make up only 1.32% of the total breeding sheep population. Their number in 2020 was 2228 animals. One of the reasons is that sheep breeding in Serbia and on the territory of Vojvodina does not represent primary production, sheep are bred semi-intensively and extensively, and therefore the most represented breeds of sheep have combined abilities.

In Figure 2, we can see that of the total number of the sheep population in the territory of AP Vojvodina in 2020 (which was 167,426) , the largest part consists of two noble breeds of combined abilities, Württemberg with 102709 and Ile d'France with 44183 sheep. Breeders keep them for the production of mutton and lamb meat. Popularity that these breeds have risen expectation that the number of animals will grow in the coming years.

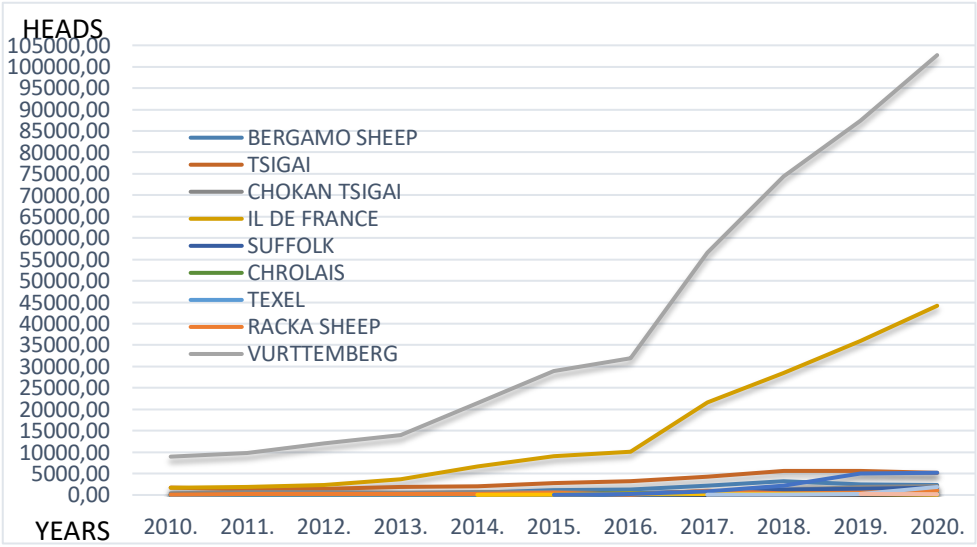

Figure 2. Schematic representation of the racial structure of sheep on the territory of Vojvodina in the period from 2010 to 2020

In Figure 3, our autochthonous breeds of sheep Tsigai, Chokan Tsigai and Horn-twisted Zuja are singled out. Their number in a period of 10 years is shown. Tsigai is our most productive breed of sheep, with combined production abilities in the direction of wool-meat-milk. Apart from Serbia, it is grown in Hungary, the Czech Republic, Slovakia, Russia, Romania and Bulgaria. The native population of the Tsigai breed on the territory of Vojvodina increased in the period from 2014 to 2019. Unfortunately, we notice that the number of Tsigai is decreasing from 5613 as it was in 2019, to 5161 in 2020. The reason for that may be that some animals did not meet the criteria for getting government subsidies determined by the breeding program in 2019, which was approved by the Provincial Secretariat for Agriculture, Water Management and Forestry. Due to the somewhat poorer quality of meat, Tsigai is less popular for the production of lamb, while their potential for milk production has almost never been used. Milk and dairy products are one of the ways to preserve this breed in the future because the market is open for these products. Chokan Tsigai represents our autochthonous breed of sheep, which is also a genetic resource in AP Vojvodina. It is used for meat production although, beside Tsigai, it is our best breed for milk production. If fed adequately, milk production is about 50 to 150 liters in lactation. From Graph 3, we can see that the number of this breed is relatively stagnant and slightly decreased in the period from 2010 to 2017. In the past few years, we have

noticed that that number was growing from 696, as it was in 2017, to 2092, in 2020. Today, its population size is stable.

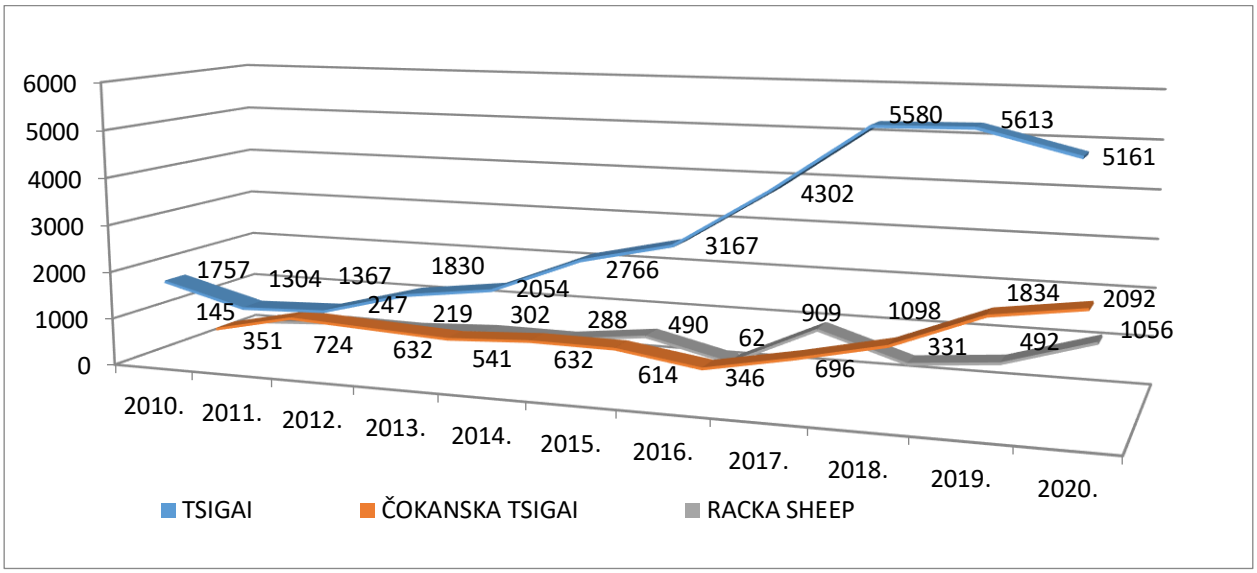

Figure 3. Schematic presentation population of autochthonous sheep on the territory of Vojvodina in the period from 2010 to 2020 in the period 2010 to 2020

The Horn-twisted Zuja is our autochthonous breed of sheep, which is also a genetic resource in AP Vojvodina. It is a breed of sheep with combined production characteristics, that has been bred in our area since ancient times and it is adapted to traditional housing conditions, which is mostly extensive. From the Figure 3, we can see that the breeding stock of Horn-twisted Zuja increased in the period of 10 years (their number was only 145 in 2012, while in 2020, 1056 were recorded). The reason for the decrease in the population in 2012, 2014, 2016 and 2018 is because the sheep were rejected if they did not meet the criteria for subsidies determine by the Main Breeding Program and the Law on animal husbandry (Official Gazette of RS 41/09, 93/12, 14/16). Today, the number of registered sheep is stable, which means that the conservation program is being successfully implemented and that efforts are made in order to preserve this breed. Subsidy measures of the state (Decree for genetic improvement of animal husbandry issued by the Ministry of Agriculture and Environmental Protection, as well as the Law on Incentives in Agriculture) contributed to the increase in the parent stock.

Conclusion

The subsidy policy of the state (Republic of Serbia) in the last 11 years has led to an explosion in the number of sheep in the registered parental herds of sheep in the territory of AP Vojvodina, but it has not led to a significant increase in the total number of sheep. In addition to the large increase in the number of noble breeds of sheep (in the number of registered parental herds) in AP Vojvodina, the number of autochthonous breeds also increased. We can conclude that the state policy aimed at genetic improvement in sheep breeding has achieved its first goal - a large number of heads are included in the registered breeding stock and their production capabilities are monitored. The next step is to increase the quality of the breeding stock. especially in autochthonous breeds, which (although their number has increased in the last 11 years) still make up less than 5% of the total number of registered heads in the breeding stock of sheep of AP Vojvodina

References

DRAGIN, S. – STANČIĆ, I. – JOTANOVIĆ, S. (2016): Biotechnology in animal reproduction. Faculty of. Agriculture, Novi Sad

DRAGIN, S. – ŠARAN, M. – RADOVIĆ, I. (2017): Preservation And Conservation Of Sheep Genetic Resources In Northern Serbia, Vojvodina, (Invited paper), The 5th International Scientific Conference "Animal Biotechnology", Abstracts: Slovak J. Anim. Sci., 50: 159–174.

JOVANOVIĆ, S. – SAVIĆ, M. – ALEKSIĆ, S. – ŽIVKOVIĆ, D. (2011): Production standards and the quality of milk and meat products from cattle and sheep raised in sustainable production systems. Biotechnology in Animal Husbandry, 27(3): 397–404.

PRENTICE, J.R. – ANZAR, M. (2011): Cryopreservation of Mammalian oocyte for conservation of animal genetics. Veterinary medicine international, p 1–11.

RADOVIĆ, I. – PETROV, B. (2001): Raznovrsnost života i struktura i funkcija, Novi Sad 421str.

STANIVUK, J. – DRAGIN, S. – ZEKIĆ, V. – STANČIĆ, I. – RADOVIĆ, I. – TIKVICKI, M. (2017): Sustainable Use Of Podolian Cow, Genetic Resources, The 5th International Scientific Conference "Animal Biotechnology", Abstracts: Slovak J. Anim. Sci., 50(4): 159–174.

STANČIĆ, I. – STANČIĆ, B. (2013): Animal genetic resources in Serbia, Slovak J. Anim. Sci., 46(4): 137–140.

STOJANOVIĆ, S. – ĐORĐEVIĆ-MILOŠEVIĆ, S. (2003): Autochthonous breeds of domestic animals in Serbia and Montenegro. Fed. Secret. Environ. Prot., Belgrade, Serbia and Montenegro, 250.

Stručni izveštaj i rezultati obavljenih poslova kontrole sprovođenja odgajivačkih programa u AP Vojvodini za 2010, 2011., 2012., 2013., 2014., 2015., 2016., 2017., 2018., 2019., 2020.

ŽUJOVIĆ, M. – MEMIŠI, N. – BOGDANOVIĆ, V. – TOMIĆ, Z. (2011): Correlation between body measurements and milk production of goats in different lactations. Biotechnology in Animal Husbandry, 27(2): 217–225.