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Current status and future strategy for Istrian goat protection, conservation, and promotion

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Abstract

The Istrian goat is one of three Croatian autochthonous national breeds. It is white in color, with typically long horns and beards, and a large body frame. Due to the small number of living individuals, it is considered a critically endangered breed. It was reaffirmed and protected in 2013. Since then, several necessary steps for its revival have been taken, including gathering information on all existing animals and breeders, taking body measurements and genotypization of goats, and founding the breeding organization. In late 2022, a plan was started to revive, promote and commercialize the breed.

Keywords: Istrian goat, Croatian autochthonous breed, conservation

Introduction

Goats have been traditionally raised in Croatia for centuries. In the 19th century, around 750 000 goats were raised in Dalmatia alone. However, this number steadily declined towards the 21st century. In 2022 there were 71 872 goats in Croatia, of which the most numerous are foreign breeds Alpine and Saanen, and the Croatian autochthonous breeds Croatian spotted goat and Croatian white goat (MINISTRY OF AGRICULTURE, 2022.). The Istrian goat is the third Croatian Autochthonous

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breed of goats native to the Istrian peninsula. The population of Istrian goats suffered the heaviest decline in number, and at the end of the 20th century, around 100 Istrian goats were left. This prompted breeders, experts, and the local community to act to save this breed from extinction. This paper aims to provide information on the Istrian goat breed's current status and discuss the future strategy for its revival.

Description of the breed

According to the official data source (MINISTRY OF AGRICULTURE, 2022), Istrian goats have a big physical frame, strong constitution, and strong bones. The base coat colour is white, but grey or cream-colored hues are allowed. Beards and horns are present in does and bucks (Figure 1).



Figure 1. Istrian goat

Table 1. Body measurements and production characteristics of Istrian goats (MINISTRY OF AGRICULTURE, 2022)

Trait	Goats	Bucks
Height at withers (cm)	60-75	65-90
Body weight (kg)	55-80	70-120
Fertility (%)	150	/
Milk production (L)	300-400	/
Kid body weight at 4-6 months (kg)	20-30	

Large, rough, and coarse horns bent backward in bucks are desirable. Bucks are heavier and taller than goats. The body weight and height at withers vary greatly in both sexes (Table 1). Withers is clearly visible. The fertility of Istrian goats is similar

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to the fertility of Croatian white goats and Croatian spotted goats, and the milk production is higher. Kids reach 20 to 30 kg at 4 to 6 months of age (Table 1).

Current status

The historical importance of the Istrian goat is best illustrated by the fact that it is in the flag of the Republic of Croatia, representing the Istria region. However, this fact alone was not a sufficient motive for conserving the breed. The number of individuals declined to about 100 until 2012, when the Istrian goat was reaffirmed and protected as a third Croatian autochthonous goat breed (IVANKOVIĆ et al., 2014). The number of animals did not change significantly since then, and in 2022 there were about 120 Istrian goats (16 bucks and about 100 does) bred in 6 flocks of different sizes (PERSONAL COMMUNICATION, 2022). Most animals are kept for meat production (kids), with a tendency to shift to dairy production.

Several steps important for the revival of the breed were taken. MIOČ et al. (2013) researched the current exterior characteristics of different age and sex categories of Istrian goats. They recorded the following exterior measurements in adult goats: withers height (65.62 cm), trunk length (73.29 cm), chest width (19.48 cm), chest depth (33.55 cm), chest circumference (90.14 cm), leg circumference (8.40 cm), length of the horns (32.22 cm) and body weight (56.06 kg). Young females (6-18 months and 2 to 3.5 years) were also measured. It was concluded that at the average age of 31 months, young females reached 96.5%, 96.9%, 88.6%, and 89.4% of withers height, trunk length, chest width, and chest depth of adult animals, respectively. Measurements showed that this is the largest autochthonous goat breed in Croatia. IVANKOVIĆ et al. (2018.) conducted a genetic characterization of 29 Istrian goats to determine the nucleus and mitochondrial DNA variability of Istrian goats and their relationship to Croatian white and Saanen goats. The authors concluded that, despite declining numbers, Istrian goats maintained a high level of genetic diversity and significant genetic distance from the other two breeds. These results provided a basis for sustainable genetic diversity management of Istrian goats and the possibility for the development of economic utilization.

In 2022, a Reference Expert Network for the Conservation of Animal Genetic Resources (cro. Referentna ekspertna mreža za očuvanje animalnih genetskih resursa; REM AnGR) was founded in Croatia. The network's main aim is to monitor, coordinate, and give opinions and recommendations for the successful implementation of the National Program for the Preservation of Autochthonous and Endangered Breeds of Domestic Animals in the Republic of Croatia 2021-2025. One of the first tasks of the experts within the network is Istrian goat conservation and revival.

Also in 2022, the Association of Istrian goat breeders was founded. The organization gathers the remaining Istrian goat breeders with the common aims of breed

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standardization, increasing the number of individuals, and commercializing the Istrian goat products.

Agency for Rural Development of Istria (cro. Agencija za ruralni razvoj Istre; AZRRI) proved to be a key link between Istrian goat breeders and experts. Guided by their success in coordinating the revival and commercialization of the Istrian Podolian Cattle breed, they intended to do the same with the Istrian goat. Therefore, in late 2022 they organized the first meeting to determine the Istrian goat's current status and plan future steps for its revival.

Future strategy

Several future steps are required and planned to revive the Istrian goat breed. The entire population of Istrian goats will be appropriately marked and registered. This will enable the precise monitoring of the number of animals and their movement between breeders. All bucks will be physically examined, and their semen will be collected, inspected, and stored. The biological samples containing DNA have been taken by the end of 2022. This will enable further molecular-genetic analyses.

One of the first tasks in *in situ* conservation is to increase the number of goats. However, pedigree data for the Istrian goat breed are incomplete. Thus, breeding plans aimed at increasing the number of individuals while maintaining genetic variability and reducing inbreeding are difficult to implement. The best option is to use the available pedigree data and the information provided by the breeders, of which the majority are familiar with the origin of their goats, especially bucks. Combining these two sources of information, a relatively sound breeding plan could be made. However, inbreeding will be impossible to avoid due to the small number of individuals. Instead, it will be kept at an acceptable level.

Production parameters will be recorded. This includes the birth weight of kids, average daily gain, body mass at weaning, duration of lactation, milk yield, and milk composition. These are the main prerequisites for the implementation of any breeding plan aimed at the increase in productivity. Milk quantity and quality traits, along with the udder conformation traits, should be prioritized.

Financial support from the Ministry of Agriculture and AZRRI should motivate breeders to be proactive in increasing the number of individuals and keeping records on their herds. Moreover, AZRRI intended to buy 20-30 young goats and „rent“ them to the breeders. That way it would be ensured that at least some goats won't be sold or slaughtered if the breeders decide to quit the job.

If everything above succeeds, the next step would be commercializing the breed and its products. Again, AZRRI, who has much experience in this area, should support the first steps. The majority of the Istrian goat breeders see their future in dairy production. Considering the Istrian environment, tourism, and specificity of the Istrian goat breed, small family farms with milk processing plants seem viable. A

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good model for dairy development might be the one implemented in Istrian sheep. Istrian sheep breeders persisted in quality over quantity. Today, the Istrian sheep cheese is the finest product of this breed, and it received transitional national protection for its origin in early 2022.

Conclusion and recommendation

The Istrian goat is the Croatian autochthonous, critically endangered breed. Its conservation and revival are important for national and cultural reasons and for preserving Croatia's animal genetic resources. Since 2013, significant efforts have been made to revive the breed. However, for long-term conservation and revival, the commercialization of breed-specific products is the best solution. Cooperation between breeders, experts, and the local community is necessary to achieve this goal.

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