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Analysis of Lipizzaner horse breeding in Serbia and Bosnia and Herzegovina

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Abstract

The aim of this paper is to analyse the breeding of Lipizzaner horses in Serbia and Bosnia and Herzegovina with special reference to the population size and implementation of breeding programs. Lipizzaner is one of the most popular breeds for horse breeding in these countries. Today, stud farms (one state and three private) and individual breeders (about three hundred) breed Lipizzaners in the Republic of Serbia, and the total population is 692 horses. In Bosnia and Herzegovina, breeding is organized primarily at the state stud farm Vučijak, where 105 horses of all categories are breeding. The work on genetic improvement and preservation of Lipizzaners is defined through various laws and bylaws, but above all through national breeding programs. The implementation of breeding programs in both countries is at a five-year level while the selection program mostly refers to the improvement of the horse's exterior, and less to the working ability exam.

Keywords: Lipizzaner, population size, breeding program

Introduction

Lipizzaner is one of the most popular breeds for horse breeding in Serbia and Bosnia and Herzegovina. This breed has a centuries-old tradition of breeding in Serbia. The first official stud farm, Gladnoš, was founded in 1920 on Fruška Gora. During the Second World War, the stud farm was disbanded, and after the end of the war, in 1946, it was renewed as the state stud farm. Also, in 1921, Karađorđevo became a state stud farm, which in that period used Lipizzaners from private breeding as a riding horse. With own breeding of Lipizzaner horses Karađorđevo started in 1929-1930, using stallions and mares from other state stud farms. Great importance for the breeding of Lipizzaner horses in Serbia has Kelebija Stud Farm which formed an initial breeding herd from Karađorđevo Stud Farm, individual Lipizzaner breeders and owners mostly from Serbia and from other state stud farms (Lipica, Đakovo, Vučijak and Lipik). In Serbia, a very important role in preserving the tradition of Lipizzaner breeding is played by individual breeders which are previously organized through equestrian cooperatives and today through equestrian clubs. The oldest equestrian cooperative was founded in 1924 in

Novi Slankamen. The members of this cooperatives rented stallions from state stud farms and already owned an enviable number of purebred mares. In Bosnia and Herzegovina the national stud farm Vučijak was founded in 1946 in Prnjavor municipality with primary goal to improve the existing horse population in North Bosnia. Initial breeding herd was formed from the Croatian state stud farms (Đakovo and Lipik) and from private breeders and owners in Croatia. Lipizzaner is one of the oldest horse breeds is breeding in many countries of the world. The largest part of the population is in Europe, but Lipizzaner is also breeding in USA, Australia and South Africa. The total number of Lipizzaner horses is 12.286 (LIF, 2021). According to the data of this organization, on state stud farm the total number of Lipizzaner is 2.114, while in private breeding total number is 10.172. The nowadays national stud farms are considered as traditional studs and they represent important centres for the preservation of the Lipizzaner horse. Each state stud farm or country has its own national breeding program, and according to the breeding goal we have two different types of Lipizzaner horses: driving and classic types which differ in body dimensions and conformation.

Morphological characteristics are very important in the breeding of horses and for a more accurate assessment of working ability, it is necessary to regularly measure breeding horses until the end of development and growth. The Lipizzaner is a very expressive horse, with a noble posture, harmonious conformation, and the frames of the body are more rectangular than squared, which can be differ according by morphological characteristics from one country to another, or from the stud farm to stud farm. ZECHNER et al., 2002 notes that the breeding goals of the stud farms have been different and are partly changing over time. According to ROGIC et al., 2018 the primary goal of the Austrian stud farm is to provide horses for classical dressage, the Hungarian stud farm has specialized in breeding of top horses for carriage driving, the Slovenian, Slovakian and Croatian stud farms are breeding riding horses, while the Romanian studs providing stallions for improvement of the local farm horse population. ČAČIĆ and ČURIK, 2015 notes that Croatian breeding of Lipizzan horses is consist of two types (two breeding goals), driving type in Đakovo stud farm and in private breeding, and classic type in Lipik stud farm. According to the LIF, 2010 the breeding goal is to preserve the purebred Lipizzaner according to the traditional breeding regulations for this type of baroque parade horse which have withers height between 153 cm and 158 cm. Research on the morphological characteristics of Lipizzaner has been conducted by many authors: ZECHNER et al., 2001; RASTIJA et al., 2004; BABAN et al., 2006; ŠTRBAC and TRIVUNOVIĆ, 2014; PALLOTINO et al., 2015; DRUML et al., 2016; VAŽIĆ et al., 2016; ROGIĆ et al., 2018, 2019, 2021.

The aim of this paper is to analyse the breeding of Lipizzaner horses in Serbia and Bosnia and Herzegovina with special reference to the population size and implementation of breeding programs.

Materials and methods

For this research, the database of the Department of Animal Science, Faculty of Agriculture in Novi Sad and database of Vučijak Stud Farm was used. Also, the national breeding programs and breeding program of Vučijak Stud Farm were used for analysis of breeding goal and selection program. The Department of Animal Science, as the Central Breeding Organization for Lipizzaner, has kept Stud Book records (central database), issued pedigrees and coordinated the implementation of the breeding program in Serbia (private breeders and Karadorđevo Stud Farm). Stud farm Vučijak implements a breeding program only on its own breeding herd while private breeders are organized through the association that does not yet have approval to implement breeding programs.

Results and discussions

Population size

According to the data from the selection reviews in 2021, stud farms (one state and three private) and individual breeders (about three hundred) breeding Lipizzaners in the Republic of Serbia, and the total population is 692 horses. Only 14 purebred Lipizzaner horses are breeding at the Karađorđevo Stud Farm and 678 at private breeders farms. The number of Lipizzaner by categories is shown in Table 1.

Table 1: Number of Lipizzaners in Serbia, 2021

Category	Karađorđevo	Private breeders	Total
Stallions for breeding	1	21	22
Stallions	3	83	86
Mares	5	293	298
Colts and fillies	5	201	206
Foals	-	80	80
Total	14	678	692

In Bosnia and Herzegovina, breeding is organized primarily at the state stud farm Vučijak, where 105 horses of all categories are breeding (Table 2). In 2022, private breeders from Bosnia and Herzegovina formed the Association of Lipizzaner Breeders, which currently has 20 members who breeding about 80 Lipizzaner horses. The plan of this association is to get the status of a breeding organization in the next period and submit an application for membership in LIF.

Table 2: Number of Lipizzaners at Vučijak Stud Farm, 2021

Category	Number of horses
Stallions for breeding	8
Stallions	6
Mares	32
Geldings	3
Colts and fillies	48
Foals	8
Total	105

If we compare the data presented in tables 1 and 2 with the data on the number of Lipizzaners from other LIF member countries (LIF, 2021), we see that Serbia is on the seventh place in the total population of Lipizzaner horses (about 6 % of total population). Hungary has the largest total population size of Lipizzaner horses (2.554), than is Croatia (2.218) and on third place is Slovenia (1.204). According to the number of Lipizzaners from private breeders, Serbia is on the fifth place (about 7 % of population), and the largest number of Lipizzaner horses is again in Hungary (2.261), then Croatia (1.982), and on the third place is the USA (919). Lipizzaner is breeding on 11 state stud farms (2.114 Lipizzaners i.e. about 17 % of total population) and according to the size of the population Karađorđevo is on the last place (less than 1 % of stud farms and total population), and Vučijak on the ninth place (about 5 % of stud farms population and less than 1 % of total population). The largest number of Lipizzaner is breeding on the

Lipica Stud Farm (369), than on the Piber Stud Farm (368) and on the third place is the Szilvásvárad Stud Farm (293).

Implementation of breeding program

The work on genetic improvement and preservation of Lipizzaners is defined through various laws and bylaws, but above all through national breeding programs. In Serbia and Bosnia and Herzegovina there are Main Breeding program for Lipizzaner in Republic of Serbia, Breeding program of Lipizzaner horse breed in Republic of Srpska for the period 2020-2024 years and Breeding program of Lipizzaner horse breed Vučijak Stud Farm.

The implementation of breeding programs in Serbia is organized at several levels that are interconnected. The first level constitutes breeders of breeding animals, and they can be registered as stud farm (private or state/national) or as private/individual breeders. Every breeder has the right to become a member of the primary breeding organization (second level) if they agree to participate in the implementation of the breeding program. The breeder confirms their consent by applying to be listed on the register of breeders of quality breeding animals and concluding the agreement on the application of the main breeding program (so-called triple agreement) with the primary and regional breeding organizations (third level). The breeder reports to the primary breeding organization all changes on their farm (births, mating, deaths, sales etc.) in the manner defined by the breeding program. In each specified region, the regional breeding organization conducts a selection review, i.e., morphological measurement and evaluation of animals. Once a year, the primary and regional breeding organizations report on the implemented activities to the central breeding organization (fourth level). The main activity of the central breeding organization is the adoption of the main breeding programs, registration of animals and keeping the Stud Book records, as well as coordinating the work of other entities that participate in the implementation of breeding programs. In the previous period, two five-year cycles of implementation of breeding programs were realized and the third one was started 2020 year.

Currently in Bosnia and Herzegovina, only the Vučijak Stud Farm is registered as a breeding organization that implements a breeding program on its own herd. Also, the Vučijak Stud Farm is authorized to keep the Stud Book in cooperation with the Faculty of Agriculture in Banja Luka and issue pedigrees for its horses. For private breeders, the registration of the breeding organization is in progress.

Breeding goal

The most important aspect of Lipizzaner breeding is organized selection work aimed at realization the following goal: breeding horses of harmonious, elegant and noble build with characteristic breed traits of the exterior, regular and generous gaits suitable for achieving top results in driving and riding, and which are useful for equestrian tourism, therapeutic riding, recreation, etc. (ŠTRBAC et al., 2019). According to PRAČEK, 1999 breeding goal of founding stud farm Vučijak was to create a horse with smaller body frame suitable for driving and carrying. ZECHNER et al., 2001 were made morphological descriptions of Lipizzaner horse populations from seven Europe countries (eight national stud farms): Lipica, Piber, Đakovo, Lipik, Fagaras, Monterotondo, Szilvásvárad and Topol'cianky. ROGIĆ et al., 2022 compare the results for the height at withers we can conclude that the stallions from Karadorđevo are the smallest in relation to the European population of Lipizzaner stallions, while the stallions from Kelebija are higher than stallions from Lipica, Monterotondo, Piber and Topol'cianky. Only mares from Piber were not smaller than mares from Karadorđevo. Mares from Kelebija are higher than mares from Beclan, Lipica, Monterotondo, Piber, Szilvásvárad and Topol'cianky.

Selection program

Selection program mostly refers to the improvement of the horse's exterior, and less to the working ability exam. Horse evaluation and selection for breeding can be conducted individually on the breeder's farm, or publicly, at previously defined places in order to evaluate a larger number of animals of the same category. Individual assessment is conducted by a commission composed of representatives of regional and primary breeding organizations who have been trained to assess the exterior of Lipizzaners. In the case of public evaluation, the commission is appointed by the central breeding organization, where in addition to the representatives of breeding organizations, international evaluators who have a LIF license can also be appointed as members of the commission.

Conclusions and recommendations

The implementation of breeding programs in both countries is at a five-year level while the selection program mostly refers to the improvement of the horse's exterior, and less to the working ability exam. For exterior assessment a linear scoring system should be considered because that score can be included in genetic analysis to estimating genetic parameters and breeding values. Also, introducing SNPs for parentage testing that could be used for other Lipizzaner genome research should be considered.

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