SAVING LOCAL GENETIC RESOURCES IN HORSE BREEDING IN BELARUS

OCHRONA MIEJSCOWYCH ZASOBÓW GENETYCZNYCH W HODOWLI KONI NA BIAŁORUSI

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STRESZCZENIE

W artykule przedstawiono informacje na temat pochodzenia koni polskich i wyników badań ekspedycyjnych ich stad na terenie gospodarstw w południowych regionach Brestu i Homela (Białoruś). 10 ogierów i 96 klaczy uznano za najbardziej istotne w kompleksie cech według standardów. W artykule przedstawiono również informacje na temat dostosowania koni polskich do lokalnego klimatu oraz różnorodność ich gospodarczego wykorzystania w nowoczesnych warunkach, a także wskazano główne postanowienia dotyczące programu ochrony tych koni w Republice Białoruś.

Słowa kluczowe: konie polskie, monitoring, pomiary zewnętrzne, ochrona, zasoby genetyczne

Key words: Polesian horses, monitoring exterior, measurements, saving, genetic resources

INTRODUCTION

Nowadays the process of improving the performance traits of farm animals through the use of modern methods of farming takes place. As a result of the intensification of the selection process new specialized, high performance breeds, types, lines and selection groups of different types of farm animals, including horses are created to meet the changing demands of the society (Book about horse 1952). At
the same time the process of displacement of less competitive native breeds and populations takes place. They have, as a rule, universal (diversified and therefore lower) productivity, but perfectly adapted to the environment. As a result their number is reduced and biological diversity of ecosystems is getting less and less, many valuable traits of native animals that can be used in the selection process for creation of new breeds are lost. Therefore, the problem of saving the native breeds and populations is not only of a general biological, but also economic importance. Around the world a lot of efforts of many scientists, government and international organizations are made to solve the problem (Gladenko 1976, 1985, 1999, Draganescu et al. 1979, Ways and forms... 1979, Harchuk and Chirkova 1987). At present time the prevailing strategy is the following postulate: there is need to save all that came to our days – a selection heritage of the nation.

In our country this heritage is represented, in particular, by Polesian horse (Fig. 1). We have determined that the most complete first scientific description of Polesian horses is presented in the publication “The Book about horse” (Kruglyak 1987). It is reported that the main habitat of this oldest populations in Europe – Ukrainian and Belarussian Polesian in the Pripyat River Basin. According to V. Gladenko (1985, 1999), Polesian horse is descended from wild ancestors – the forest wild horses, which had been living in numerous forests in Belarus until the end of the 18th century.

Fig. 1. Mare of Polesian horse (photo by Vladimir Chavlytko)
Ryc. 1. Klacz konia poleskiego (fot. Vladimir Chavlytko)
Population of Polesian horses had been forming in closed condition “in itself” for many centuries. “Wild” paint is common, as well as dun, roan, mousy – that indicates low degree of cross-breeding of the original forest horse. Horses of Polesian populations were highly valued by local population. They met the economic needs of the majority of farms, were unexacting to feed and could perform their job and reproductive traits for a long time period, even with poor feeding mainly with roughage, poor maintenance and excessive use for work. This led to their refinement, the emergence of a number of constitutional and exterior features and at the same time developed the strongest natural immune system, high adaptive traits, ruggedness, tireless in work that are steadfastly transferred to their offspring. According to the classification of Russian Scientific Research Institute of Horse Breeding, Polesian horse belongs to a group of local breeds. On growth it is similar to the large ponies that are the world’s most widely used in leisure horse breeding. Height of small horses normally does not exceed 147 cm.

Due to the active mechanization of agricultural production, modernization of farms, reducing the rural population, the scope of a live pulling force in the agricultural organizations was reduced as well. Polesian horses turned to be of a less demand in work horse breeding as well. However they are still used particularly at farming and rural farmsteads. The use of Polesian horses in the developing leisure horse breeding, equestrian sports and ecotourism is promising as well, as we have reported before. It is necessary to organize the work aimed at its preservation and improvement. The most important traits of the horses is a great adaptability to local conditions, ruggedness, kind character. They should be used in the currently executable state program for development of Belarusian Polesian.

The aim of our study was determination of the modern state of Polesian horse population in the Republic of Belarus and development of proposals for their future relevant use.

MATERIAL

The materials for the research were the horses of Polesian population, archive data and available literature. Monitoring of horse stock in Brest and Gomel regions was carried out at farms located in the floodplain of the Pripyat River. Horses were evaluated individually by a complex of traits – origin, typical state, measurements, conformation, health and quality of offspring. The following measurements were used: height, body length, chest girth and metacarpus. The typical Polesian horses were considered to be those that met all the traits of the developed model standard. Features of breeding and farm use of Polesian horses were determined by analysis of the available zoological and technical documentation, financial statements, and survey of experts, breeders and horse owners. According to the research results, the basic farms were determined.

In the course of studies we determined that the main part of the population of Polesian horses received little significant selection pressure from the global gene pool, and there was no systematic work carried out to improve the horses of Polesian population in our country. The quality of the horses had been periodically evaluated
during the expedition studies of stocks in the area of their rearing. This work was performed by associates of the Belarussian Institute of Animal Husbandry in the period from 1951 to 1956 under supervision of Ivan Orlovsky. The studies continued during the period from 1966 to 1969 under supervision of Vladimir Gladenko. That time 52 foals and 374 mares of Polesian horse population were recorded. The presence of Polesian horses was determined in 10 districts of Brest and Gomel regions and the negative impact of unsystematic crossing of the local stock with stallions of various plant species was noted. The resulting hybrids as a rule have tended to be of a lower quality compared to the original parental forms, primarily due to bad adaptation traits of the produced offspring.

RESULTS AND DISCUSSION

In 2010 together with specialists from the breeding services of the country monitoring of stock in southern districts of the Brest and Gomel regions was carried out. 10 stallions and 96 mares belonging to Polesian population were determined at 11 farm enterprises. Mares have the following measurements: height – (140.1±0.27) cm, body length – (148.6±0.28) cm; chest – (166.1±0.52) cm; metacarpus – (17.95±0.05) cm. Stallions were 2-3% larger in all measurements. By results of phenotype evaluation the format index (106.1%) was calculated, which confirmed the high intensity of draft type of horses, Polesian horses were significantly inferior to the Belarussian breed by both the indices of massiveness and bones.

Indicators of stallions and mares development established in the examined area are presented in the table 1.

Based on analysis of published data and the results of the study of the modern state of Polesian population, it was determined that formed over a long period of time Polesian horse is stable enough. Over the past 45-50 years these figures have

<table>
<thead>
<tr>
<th>Measurements (in cm)</th>
<th>Study results</th>
<th>Study results</th>
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<tr>
<td></td>
<td>Russian Scientific Research Institute of Horse Breeding data (1952)</td>
<td>Belarusian Scientific Research Institute of Horse Breeding data (1966)</td>
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<tr>
<td></td>
<td>stallions mares</td>
<td>stallions mares</td>
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<tr>
<td></td>
<td>n=52 n=374</td>
<td>n=52 n=374</td>
</tr>
<tr>
<td>Height</td>
<td>137.7 136.5</td>
<td>140.4 139.4</td>
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<tr>
<td>Body length</td>
<td>140.8 139.1</td>
<td>151.4 150.0</td>
</tr>
<tr>
<td>Chest</td>
<td>165.1 159.2</td>
<td>169.1 168.4</td>
</tr>
<tr>
<td>Metacarpus</td>
<td>18.4 17.9</td>
<td>18.8 18.6</td>
</tr>
</tbody>
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Table 1
Changes of measurements of Polesian population horses

*Pomiary ciała koni poleskich*
not changed significantly. More significant were the differences in size according to Russian Scientific Research Institute of Horse Breeding (1952) and Belarusian Scientific Research Institute of Horse Breeding data (1966), due to their small amount for sampling and the fact that these studies were conducted in different regions of Polesye. Therefore, we can say that the average measurements of the modern Polesian horse population should be used as a typical model for the near future.

Depending on the desired type, the model mare of Polesian population must have the following measurements: height – 138-145 cm; body length – 145-150; chest – 160-170; metacarpus – 17.5-18.5 cm. Stallions should be 2-3% larger in all the measurements. The body is compact, elongated, chest is broad, not deep, the back is slightly elongated, short loin, croup is short, slightly hanging, and feet are dry, dark and durable hoof horn. The colors are predominantly – bay, buckskin, chestnut, roan, dun, crow and piebald.

As a result of researches the basic farms are determined to be the following: SPK “Gorodoksky”, SPK “Agrogranit” of Luninetsk area, branch “Nevel”, SPK “Valische” of Pinsk area, SPK “Polesskaya Niva” of Stolin area, JSC “Turovschina” of Zhitkovichy area, SPK “50 let BSSR” of Kalinkovichy area, SPK “Imeninsky” of Droginchin area. Directions for further work in horse breeding industry were developed for all agricultural enterprises together with specialists from farms. The increase in the number of stallions and mares will be done through self-repair and exchange of breeding young animals.

Analysis of horse use at basic farm shows that more than 60% of the available here working horses – are geldings, and only 40% are mares; there are no significant differences in the features of works they perform. It was determined that 80.2% (46.2-100%) of all adult horses are constantly working. More than 80% of the horse works are services at animal farms (supply of feed and bedding for distances up to 2 km, manure removal, collection of milk from the population). 5 to 7% of the horses are performing transport works. About 15% of the horses are constantly servicing at private backyards of population. The horses are mainly used in two-horse harness, which increases the performance of horse works by increasing the weight of the goods transported, and reducing the amount of riders.

Horses of Polesian population are characterized by a relatively high reproduction rate, the yield of stallions is 59.4% of foals. On average in the country the value for the number of years does not exceed 40%. The essential dependence of the parameters of reproduction of mares from the conditions of their use was determined: the more intensively they are used for work, the worse the reproduction rate and stallions output is. Taking this into account, numbers of practical techniques that can improve the reproduction rate of mares are developed and used: the formation of the optimal structure of horses use with the presence of small (up to 10%) amount of a geldings, for the most energy-intensive works; creation of reproduction groups of mares (breeding nucleus) at each farm; planning of mares mating and giving birth to produce offspring in the early spring time; the incentive material motivation of horse breeders for obtaining and growing of stallions.

The program of energy and resources saving in the modern agricultural production is not contrary to the active use of horses where the work of modern powerful machinery is irrational (Ruban 2009). It is well known that the work of one horse for a year
saves up to 2-3 tons of fuel and lubricants (Book about horse 1952). This is a significant economic factor in favor of the use of horses, especially in short supply of energy. Polesian horse remains in demand from both economic and social point of view.

A convincing proof of the social and economic benefits of the various uses of horses is the experience of breed formation in Germany, Poland, France and in the United States and other developed countries, where the share of work performed using a live tractive force declined within the modernization of agricultural production, but the number of horses was not reduced due to that. In the new environment they were used differently, especially in sports, equestrian tourism and in leisure horse breeding. Such breeds of horses in Germany, as Trakehner, Hanoverian, Oldenburg, and other were previously working breeds, gradually transformed into the world’s best sporting breeds (Practical horse breeding... 2000).

The authors believe that the loss of any breed or population is dangerous first of all by unifying of the overall gene pool of the breed, reducing the genetic variability and decreasing the ability to quickly change the performance direction when the needs of society change in the future.

A significant economic factor that contributes to the need to preserve and improve Polesian horses is the use of domestic breeding resources. Rational use of horses of Polesian population will at minimum cost provide both agricultural producers and scope of leisure and health of the population in the competitive production of horse breeding.

As a result of the studies conducted the program of conservation of the population of Polesian horses in the Republic of Belarus was developed. This program is used in practice.

**REFERENCES**


