

Dairy goat breeding in Russia and the world (review)

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Abstract. The situation of the development of dairy goat breeding in the world and in Russia is considered. Interest in goat milk as an object of functional nutrition is noted. The history of dairy goat breeding in Russia is described. It is shown that this country does not have a single domestic breed of dairy or meat goats. It is emphasized that the majority of dairy goats in the Russian Federation are local outbred goats, but many territories are interested in purebred breeding and have favorable conditions for the development of goat breeding. The research materials were the results of a generalization of the experience of foreign and domestic goat breeders. Alpine, Nubian and Czech goat breeds have been identified as promising. These breeds are still rare for the country and characterized by high productivity. It is important to carry out selective work and have state support for the development of the industry. Despite the good prospects for the development of industrial dairy goat breeding, the basis will be farms and personal households in the near future. It is advisable to create associations of goat breeders at regional levels, as well as at the all-Russian level with international relations, for training farm specialists and all interested goat breeders in techniques for breeding work, technology for keeping and feeding animals, which will help to increase their professional level and develop the industry in general.

Keywords: dairy goat breed, Zaanen, Alpine, Nubian and Czech breeds.

Introduction

Goat breeding is one of the oldest livestock industries. The ancestors of modern domestic goats were domesticated immediately after dogs, about 8-12 thousand years BC, and are successfully bred by people to the present day.

In recent years, raising goats for milk has become a widespread economic activity in many countries due to the current trends in proper nutrition [1].

Goats have a number of features, due to which many livestock breeders give them preference over other types of agricultural herbivores. They have high adaptive ability

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to various conditions of keeping, make excellent use of low-productive pastures and a wide range of grazed plant species, digest feed with a high (up to 60%) content fiber, willingly eat young tree branches, have a strong hoof horn. In addition, an important factor in the breeding of goats is their resistance to many diseases (immune to smallpox, plague, tuberculosis, trypanosomiasis, resistant to scabies, mastitis).

It is known that milk is obtained from a fairly large number of species of mammals and agricultural animals. At the same time, the first place in the production and consumption of milk belongs to cattle – more than 95% of all milk produced in the world. Goat milk ranks second in the world structure of milk production (2.4%). Goat milk in Russia, unlike in Asian countries and a number of European countries, is less popular among the population than cow's milk [2], but due to its high nutritional value, it is considered by researchers as an object of functional nutrition by scientists from different countries [3, 4, 5, 6, 7].

Cows and goats differ not only in the amount of milk. There is also a significant difference in chemical composition. The biological value of goat milk is higher than that of cow milk. The fat content of goat and cow milk is about the same but goat milk has fewer fat globules. It is easier for the human body to digest it [8].

It should be noted that goats have economic advantages over cows in breeding as they are cheaper to keep and require less housing. The purpose of our research is to analyze the development of goat breeding in the world and in Russia and to identify the most promising breeds of dairy goats for the development of goat breeding in the country.

Materials and Method

The methods of our research were: studying information data from various literary sources and Internet resources, observing animals of dairy goat breeds exotic for Kuzbass, such as Alpine, Nubian and Czech, raised on personal farms of the Kemerovo region.

Results

Goats have traditionally had a strong impact on the social and economic life of people, especially in rural and technologically underdeveloped regions of the world. When properly bred, goats contribute to the conservation of ecosystems and can be used as an ecological tool to control harmful weeds, reduce the incidence of forest fires and improve rangelands and wildlife habitats.

Since the 1960s, there has been a steady increase in the number of goats in the world, especially in low-income countries. Over the past three decades, the milk yields and the number of goats have doubled, mainly due to the Asian and African regions, while there is a specialization and intensity of production growth, in particular, in Europe [9]. According to the Food and Agriculture Organization of the United Nations (FAO), the total world population of domestic goats is 700 million and the total annual production of goat milk is 12 million tons. Goat breeding, depending on the direction of productivity, is conventionally divided into three groups such as meat, dairy and wool-down. The meat direction of this industry prevails in China and India, wool direction predominates in the USA, Turkey and South Africa. There are about 2.7 million goats in the United States, of which 440,000 are dairy goats [10]. Historically,

they were considered a secondary animal compared to the cow [11]. However, the demand for goat milk products such as cheese and yogurt is increasing and is likely related to changes in the demographic composition of the population, leading to an increase in the production of goat milk throughout the United States [12]. Specialized dairy livestock is concentrated in Europe and Canada. Goat breeding abroad is actively developing and is a very profitable branch of animal husbandry. Figure 1 shows the largest countries-producers of goat milk in the world [13].

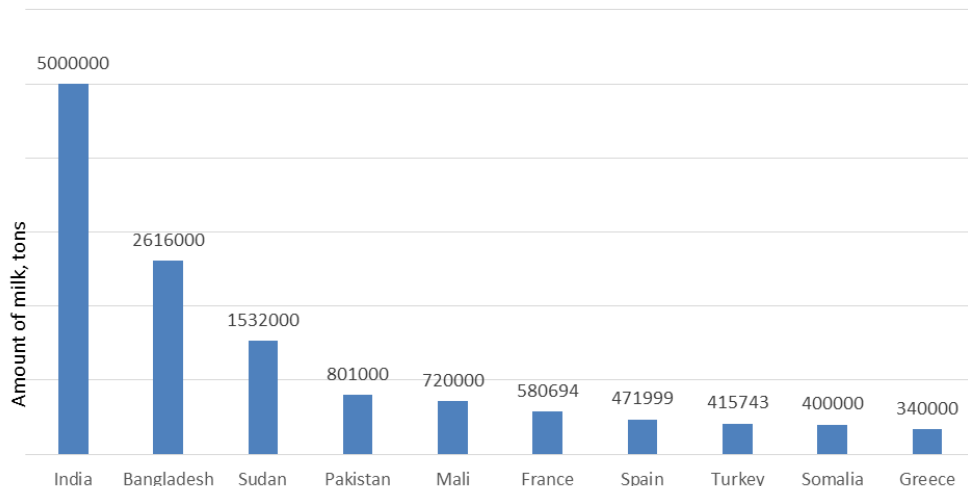


Fig. 1. The largest goat milk producing countries in the world (Compiled by the authors)

India is the world's largest producer of goat milk, producing over 5 million tons per year. Goat breeding is popular in India due to the peculiarities of the national culture and taboos regarding cows. The number of goats in the country is almost 25% of the total livestock population. In this country, population is mainly engaged in breeding goats of the local breeds of Beetal and Jamnapari. Farmers raise goats for commercial milk production. The main problems faced by livestock breeders in India are poor veterinary and medical services, lack of breed specialization and low level of breeding work, technological lag.

Bangladesh ranks second in the list of the leading producers of goat milk. According to the Food and Agriculture Organization of the United Nations (FAO), goat milk accounts for 62% of total milk production in Bangladesh (cow and buffalo milk - 32% and 1%, respectively). It is more than 2.5 million tons. The Black Bengal is one of the main dairy goat breeds in Bangladesh. The Bengal black goat is known to have high milk yields when properly fed and cared for. Milk is intended primarily for commercial purposes and for the manufacture of traditional Bangladeshi dairy products.

Most villagers in Sudan raise goats primarily for milk and meat. The annual production of goat milk in this state is 1.5 million tons. The dairy goat industry is thriving in Sudan because, unlike cows, goats can comfortably survive in dry and hot

climates. The goats raised in Sudan are desert and Nilotic goats. Goat milk in Sudan is mainly for local consumption.

The annual milk production in Pakistan is over 800,000 tons. Popular Pakistan goat breeds are Beetal, Camori and Barbari. The problems facing goat breeding in Pakistan are related to poor veterinary care.

Although the main stock of dairy goats is concentrated in developing countries, programs for the development of the dairy goat industry are active in Europe and North America. Long-term directional breeding work has provided a significant increase in the level and quality of dairy products obtained from goats and the duration of the lactation period. As a consequence of this work, specialized dairy breeds of European goats have a much higher genetic potential for productivity than native breeds common in developing countries. In recent decades, specialized breeds have been exported to many countries and interbred with local breeds in an attempt to improve milk production. The most common dairy goat breeds in the world are Zaanen, Nubian and Alpine.

The history of Russian goat breeding began with Prince Urusov and other enthusiasts advocating for the health of the population, who brought several thousand purebred animals from Europe to Russia from 1906 to 1913, created the Union of Goat Breeders, which included 42 provinces, kept a breed book and published a magazine on goat breeding. Most of the imported animals were represented by Zaanen goats. In 1917 the industry lost state support and with the development of collective and state farms the country's leadership introduced a ban on keeping more than three goats in one household. This measure was due to the fact that the villagers preferred not to work on a collective or state farm, but to have a more profitable occupation as keeping goats to obtain wool, from which shawls, mittens, socks, sweaters were knitted for sale. In the USSR, goats were mainly bred for wool, not milk or meat. Nevertheless, thanks to the crossing of the imported Zaanen goats with Russian outbred goats, their genetic indicators were improved. In the 1980s, the state purchased Zaanen goats from New Zealand and Czech whites from Czechoslovakia, distributing them to three non-core breeding farms, but did not provide information and technological support. The animals at the enterprises were ruined and the young were bought up by the population, who liked the goats of this breed. Thus, there is not a single domestic breed of dairy or meat goats in Russia [14].

E.M. Shchetinina and Khodyreva Z.R. [14] note that most of the livestock is concentrated in private farms and breed selection is not supported. According to Rosstat, more than 91% of goats are concentrated in households of the country. There is no such concentration in private households in any other branch of animal husbandry. Thus, the bulk of dairy goats in the country are local outbred goats (99%), but many territories are interested in purebred breeding and have favorable conditions for the development of goat breeding.

In Kemerovo region, in the village of Pervomaisky (Promyshlennovskiy District), the only cheese dairy was opened producing goat cheese in December 2019 [15]. The Altai Territory is known in this country as the land of developed cheese making. Not so long ago, goat breeding began to develop on the territory of the region. Due to natural, climatic and economic conditions, more effective management of other livestock industries some regions in Russia can make goat breeding a promising branch of

productive livestock breeding [16]. But to raise the industry, not only pedigree work is needed, but also the support of the state.

At the beginning of 2020, the total number of goats in the Russian Federation was 1,962 thousand heads, of which 36 thousand were dairy goats [17]. The production of goat milk in Russia per year is currently 256 thousand tons (Fig. 2).

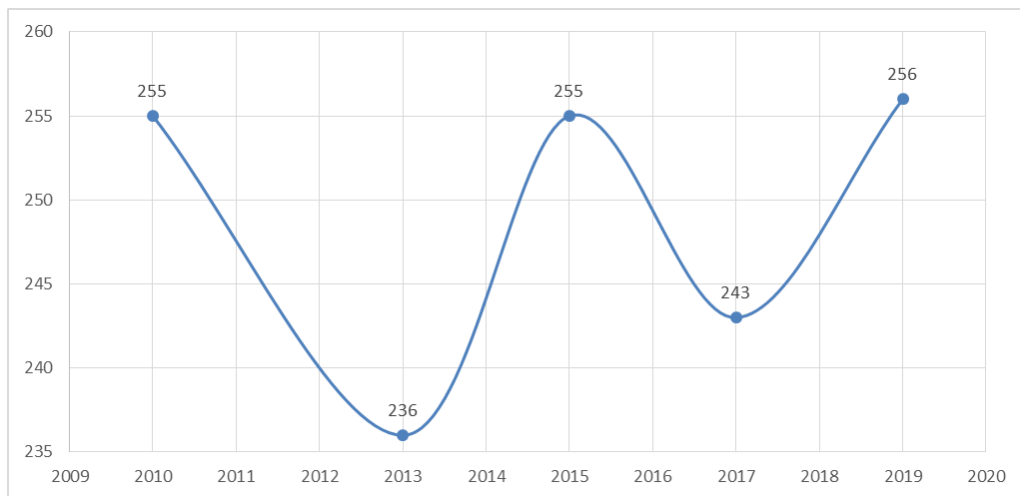


Fig. 2. Production of goat milk in the Russian Federation, thousand tons (Compiled by the authors).

The breed diversity is growing in the dairy goat breeding of the country. In Russia, in addition to the Zaanen breed, Alpine, Nubian, Czech breeds of dairy goats are bred. According to S.I. Novopashina et al., there are currently two large farms in the country for keeping dairy goats of the Alpine breed, which contain highly productive imported livestock. Nubian goats are also very popular in Russia, but the lack of standards for assessing these breeds of goats makes it impossible for farms to obtain the status of breeding reproducers [18].

The Zaanen goat breed is the most widespread in the world. Many Russian scientists are also studying this breed [19, 20]. Zaanen dairy goats are known for their large size and calm nature. Most goats are 78 to 81 cm in height, but some are known to grow up to 89 cm. A goat usually weighs around 65 kg. In addition to being the largest dairy goat breed, it also produces more milk than any other breed. Milk usually contains three to four percent milk fat.

The Nubian breed is large, hornless. Milk production is about 1000 - 1500 liters per lactation, with a daily production of 4-6 liters, with a high fat content (4.8%) and protein content (3.8%), which is ideal for cheese production. The breed is also suitable for meat production, kids grow quickly.

The Alpine breed is also considered a large breed of domestic goats known for their high milk production. The average fat content in milk is 3.5%. This milk is used for making butter, cheese and ice cream, as it is completely devoid of the goat smell.

The Czech brown short-haired goat breed is resistant, suitable for individual and herd breeding, including mountainous areas and grazing systems [21, 22]. Milk

productivity for the lactation period (280 days) is 800-900 kg. The mass fraction of protein in milk averages 3.0%, fat - 3.3%.

Alpine, Nubian, Czech dairy goat breeds are heat demanding. In the harsh Russian winters, especially in Siberia, animals are kept in a heated room, free from drafts, with good ventilation and in thirty-degree frosts they do not go for a walk so as not to get frostbite. Full realization of the potential of milk productivity of goats and cost-effective production of products is possible only if the animals are created optimal, corresponding to their biological needs, growing conditions. When breeding goats, special attention must be paid to the observance of the conditions for normal ventilation of the premises, the availability of dry bedding material in sufficient quantity, the uninterrupted provision of the livestock with high-quality feed and water and the minimum disturbance of the animals.

Discussion

Russia currently has 197.8 million hectares of agricultural land, of which 116.2% is arable. The country's climate is suitable for the production of cheap and high-quality feed. There is a developed processing sector and there are trends of growing demand for goat products. All this creates favorable conditions for goat breeding to become a sector that can offer a significant number of jobs in rural areas and become a sustainable source of income for the rural population. Over the past five years, a small number of dairy goat farms have appeared in Siberia. Farmers process milk by relying on direct market sales of their products and the development of their own distribution networks. Food prices are relatively high, which allows farmers to work with maximum profit. Goat breeding is a unique production niche with potential growth. Goat products, subject to certain conditions, such as standardized quality, guaranteed food safety, continuity of delivery, branding, attractive packaging, have an export potential.

Goats have always been bred in Russia, but most of the goats were kept and are still kept in households. The production was aimed at self-sufficiency in wool, milk, meat, so there was no industrial processing of goat milk. Goat farms began to appear in the late 1990s and early 2000s. But the interest of agricultural producers in goat milk and dairy goat breeding began to be observed only in the last 5 years. The dynamic development of the industry restrains a number of unresolved problems, the main of which is the lack of a sufficient number of highly productive animals of specialized dairy breeds [18]. In the Russian Federation, four breeds of dairy goats are currently included in the State Register of Breeding Achievements Admitted to Use. They are Alpine, Zaanen, Mursiano Granadina and Niubian. But purebred breeding is carried out only by the Zaanen goat breed (there are nine breeding organizations, of which two breeding plants, six breeding reproducers and one gene pool). At the same time, breeding plants and reproducers are located on the territory of the republics of Chuvashia, Tatarstan, Mari El and Dagestan, Kursk region, Saint Petersburg region (2 farms) and Stavropol Territory (2 farms). In Siberia, at the moment, there is not a single agricultural enterprise officially engaged in purebred pedigree breeding of dairy goats.

Conclusion

Industrial dairy goat breeding is a very young and promising branch of animal husbandry for Russia. Special attention should be paid to the Alpine, Nubian and Czech breeds of goats, which are still rare for the country, characterized by high productivity, whose milk does not have a specific smell. It is important to import purebred highly productive dairy goats from other countries and engage in breeding work with them in the Russian Federation, taking into account the climatic and other characteristics of this country and individual regions. The development of the industry requires not only pedigree work, but also state support. In the coming years, the number of dairy goats will grow most actively in the sector of private farms and households of the population. At the same time, the development of the industry will contribute to the implementation of the state program “Comprehensive development of rural areas” and other social projects for rural development. It is advisable to create associations of goat breeders at the regional levels, as well as at the all-Russian level with international relations, to train farm specialists and all interested goat breeders in methods and techniques for conducting selection and breeding work, technologies for keeping and feeding animals, which will help improve their professional level and develop the industry in general.

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