https://doi.org/10.26898/0370-8799-2023-11-13
УДК: 636.082
Тип статьи: обзорная
Type of article: review

ПРОШЛОЕ И НАСТОЯЩЕЕ ПЛЕМЕННОГО ДЕЛА В МОЛОЧНОМ СКОТОВОДСТВЕ КРАЙНЕГО СЕВЕРО-ВОСТОКА

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Статья призвана с опорой на исторические факты и прошлые достижения актуализировать важность и доказать возможность успешного ведения племенной работы на уровне региона с целью повышения объемов производства качественных социально значимых продуктов питания для обеспечения продовольственной безопасности. В начале становления сельскохозяйственной науки в Магаданской области перед учеными стояла задача по подбору оптимальных для региона пород скота. За 1964–1967 гг. было обследовано более 4000 коров. Установлено, что в экстремальных природно-климатических условиях Магаданской области наилучшим образом себя зарекомендовала холмогорская порода. В 1967 г. с целью дальнейшего совершенствования холмогорской породы сделана первая попытка изучения генеалогической структуры стада, выявления и оценки высокопродуктивных линий. В 1974 г. для повышения жирномолочности помесных коров холмогорской породы применяли вводное скрещивание с быками-айрширами, проверенными по качеству потомства. С целью совершенствования дойных стад отбор коров по наследственным признакам сочетают с их проверкой по первой лактации. С 1976 г. в совхозах было начато изучение племенных и продуктивных качеств айрширского скота, который отличался большой обильномолочностью и высоким содержанием жира в молоке. С 1982 г. айрширская порода утверждена как плановая для разведения в хозяйствах Приохотской зоны. В этом же году начато поглотительное скрещивание животных холмогорской породы с производителями айрширской породы. В рамках повышения эффективности селекции по обильномолочности в хозяйствах вели работу по увеличению наследственной изменчивости этого признака за счет разведения по линиям и семействам. Вместе с тем продолжилось совершенствование холмогорского скота путем вводного скрещивания с чистопородными быками голштино-фризской породы. К 1990-м годам основным вектором развития стало создание высокопродуктивных стад молочного скота, но тяжелое финансовое положение хозяйств в 1990-е годы привело к резкому снижению поголовья крупного рогатого скота и продуктивности оставшихся животных.

Ключевые слова: Магаданская область, история, развитие, молочное скотоводство, селекционно-племенная работа, продуктивность

THE PAST AND PRESENT OF BREEDING IN DAIRY CATTLE BREEDING IN THE FAR NORTH-EAST

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Based on historical facts and past achievements, the work is designed to update the importance and prove the possibility of successful breeding work at the regional level in order to increase the production of high-quality, socially significant food products to ensure food security. At the beginning of the formation of agricultural science in the Magadan region, scientists were faced with the task of

selecting the optimal breeds for the region. More than 4000 cows were examined during 1964–1967. It was found that in extreme natural and climatic conditions of the Magadan region the Kholmogory breed proved to be the best one. In 1967, in order to further improve the Kholmogory breed, the first attempt was made to study the genealogical structure of the herd, to identify and evaluate highly productive lines. In 1974, in order to increase the milk fat content of crossbred cows of the Kholmogory breed, introductory crossing with the bulls of the Ayrshire breed, tested for the quality of the offspring, was used. In order to improve dairy herds, the selection of cows for hereditary traits is combined with checking them for the first lactation. Since 1976, state farms began to study the breeding and productive qualities of the Ayrshire cattle, which were distinguished by high milk production and high fat content in milk. Since 1982, the Ayrshire breed has been approved as a planned breed for breeding in the farms of the Okhotsk zone. In the same year, absorptive crossbreeding of the animals of the Kholmogory breed with the sires of the Ayrshire breed began. In order to increase the efficiency of breeding for abundant milk production, work began on the farms to increase the hereditary variability of this trait through breeding along lines and families. At the same time, the work on improving the Kholmogory cattle by introductory crossbreeding with the purebred bulls of the Holstein-Friesian breed continued. By the 1990s, the main vector of development was the creation of highly productive herds of dairy cattle, but the difficult financial situation at farms in the 1990s led to a sharp decrease in the number of cattle and the productivity of the remaining animals.

Keywords: Magadan region, history, development, selection and breeding work, dairy cattle breeding, productivity

Для цитирования: *Гинтер Е.В., Лыков А.С.* Прошлое и настоящее племенного дела в молочном скотоводстве Крайнего Северо-Востока // Сибирский вестник сельскохозяйственной науки. 2023. Т. 53. № 11. С. 130–137. https://doi.org/10.26898/0370-8799-2023-11-13

For citation: Ginter E.V., Lykov A.S. The past and present of breeding in dairy cattle breeding in the Far North-East. *Sibirskii vestnik sel'skokhozyaistvennoi nauki = Siberian Herald of Agricultural Science*, 2023, vol. 53, no. 11, pp. 130–137. https://doi.org/10.26898/0370-8799-2023-11-13

Конфликт интересов
Авторы заявляют об отсутствии конфликта интересов.
Conflict of interest
The authors declare no conflict of interest.

The intensive development of the Far Northeast, which is one of the most significant regions for the country in terms of resources and geopolitical characteristics, began in the second third of the 20th century. During geological expeditions to the upper Kolyma regions in the late 1920s, large gold deposits were discovered. As a result, the strategic tasks included comprehensive development and incorporation of previously uninhabited territories into the country's unified national economy as the main supplier of currency to implement large-scale industrialization plans. During the years of Soviet construction, the Far Northeast turned into a rapidly developing industrial region [1]. One of the priority tasks of that period was to establish a food base in areas where the creation of agricultural production seemed impractical. The need to provide the population with fresh food products contributed to the development of new agricultural sectors, the organization of state farms, large livestock farms, and poultry farms. One of the basic branches of agricultural production became dairy cattle breeding.

In the early 1930s, several agricultural enterprises were created by Dalstroy, for which large cattle of various breeds were imported from the Primorsky Territory without proper selection: Simmental, Kholmogory, Yaroslavl, East Friesian, Schwick, Bestuzhev, as well as Siberian and Red Steppe cattle. As of January 1, 1938, Dalstroy enterprises had 1,612 head of large cattle, including 729 cows. By the end of 1950, the size of the dairy herd reached 8,666 head,

including 3,680 cows. By the early 1960s, the public livestock industry in the region had 9,509 head, including 6,490 cows[1].

Until 1967, pedigree work was not carried out in the Magadan region. Improvement of the quality and productivity of cattle was done according to the scheme for commercial farms, where high-quality breeding bulls and highly productive breeding livestock were imported from the best breeding farms in the country. Artificial insemination of cattle was not widely used due to the lack of a station for breeding work and artificial insemination.

At the beginning of the formation of agricultural science in the Magadan Region, scientists were faced with the task of selecting optimal cattle breeds for the region. Based on the Magadan Regional State Agricultural Experimental Station, a comparative assessment of the productive and breed qualities of the Kholmogory, Simmental, and Kostroma breeds was carried out, and the Kholmogory breed was improved through planned selection (see Fig. 1). The research goals included identifying lines of purebred cattle through planned selection and developing a system for raising young stock from highly productive cows.

Based on the surveys, a comparative study of cattle breeds was conducted in nine farms producing over 50.0% of the milk in the region. Over the years 1964-1967, more than 4,000 cows were surveyed. As a result, it was established that the Kholmogory breed performed best in the extreme natural and climatic conditions of the region.

In 1967, scientific and economic experiments were conducted for the first time at the experimental production farm of the Magadan Regional Agricultural Experimental Station. Based on the principle of analogs, cows of the Kholmogory and Simmental breeds were selected. Research showed that the Kholmogory breed was more cost-effective in terms of labor and feed expenses, making it better adapted to the conditions of the Magadan Region. Under identical

Рис. 1. Проведение экстерьерных промеров сотрудниками Магаданской областной государственной сельскохозяйственной опытной станции

Fig. 1. Conducting exterior measurements by the employees of the Magadan Regional State Agricultural Experimental Station

feeding, care, and maintenance conditions, the productivity of the Kholmogory cows, in terms of 4% fat milk, was found to be different. During the lactation period, the milk yield of the Kholmogory cows was 321 kg higher than that of the Simmental cows, and the amount of milk per 100 kg of live weight was 66 kg higher. However, the feed cost for the Kholmogory cows was higher, requiring 6 feed units less to produce 1 ton of milk[2].

During the same period, the region developed a breeding plan for dairy cattle in state farms and collective farms for 1967-1970, in which the Kholmogory breed was designated as the first planned breed for the region. It was noted that "the problem of creating the first dairy cattle state farms in a still undeveloped region was solved by importing productive dairy cattle from the central regions of the country, as practical resolution of this issue through the local indigenous cattle population, due to its small numbers, was impossible." The plan provided character-

[1]*Shumilov M.F., Sysoev V.V.* Sketch of the development of veterinary service of Magadan region // Magadan reindeer-breeder, 1982, N 34, pp. 33-36.

[2]*Vaganova E.S.* Proceedings of the Magadan Regional State Agricultural Experimental Station. Magadan, 1968, Issue 3, pp. 69-72.

istics of productivity, breed, and class composition of the herds present in the Magadan Region. Out of 8,210 animals that underwent evaluation, 3,743 were selected for breeding, including 23 in the elite-record class, 560 in the elite class, 2,617 in Class I, and 543 in Class II. A brief description of the Kholmogory bull breeding was given. The main organizational, economic, and zootechnical activities were outlined within the framework of breeding work in farms for 1968-1970. The first attempt was made to study the genealogical structure of the herd, identify and evaluate high-productivity lines to further improve the Kholmogory breed.

To coordinate breeding work in dairy cattle farming in state farms and collective farms in the Magadan region, a plan was drawn up for the years 1971-1980. This plan determined the overall directions for work with the Kholmogory breed, planned industry indicators, and the plan for linear assignment of the Kholmogory stud bulls to regional farms. As of the beginning of 1971, the region had 16.1 thousand head of large cattle, including 9.5 thousand cows. In the period under consideration, the average annual milk yield per forage cow increased by 202 kg compared to 1961-1965, reaching 3,072 kg.

From March 1974, artificial insemination of cows with deeply chilled semen from bulls from the Central Artificial Insemination Station was introduced in the region. To improve the fat content of crossbred Kholmogory cows, admixture of new blood of the Ayrshire bulls, proven in terms of offspring quality, was used.

In the plan for 1976-1985, tasks and methods for further improvement of the livestock, principles of selection, and breeding by lines and families have been defined. The leading selection criterion, while maintaining satisfactory development of other indicators, remains milk productivity. Animals of the desired type should have a productivity of no less than 4000-5000 kg per year, an optimal weight of about 550 kg, a calm temperament, and a voluminous udder. To improve the dairy herds, the selection of cows based on hereditary traits should be combined with checking their performance based on the results of the first lactation. One of the most important conditions for the formation of high-productivity herds at that time was the acquisition and rearing of high-quality replacement young stock[3].

The Ayrshire breed, imported to the Magadan region from Karelian ASSR since 1969, began to attract increasing interest. Crossbred heifers of the first and second generations, aged 12-17 months, were imported, with crossbred cows of the Kholmogory, Brown Latvian, and Jersey breeds of various bloodlines as the maternal basis, and purebred Ayrshire bulls of Finnish origin as the male basis. Comparative study of economically valuable traits of the Kholmogory and Ayrshire cows showed that the milk yield for 305 days of lactation in the Ayrshire cows was 77 kg higher than in the group of their Kholmogory counterparts (see Fig. 2). These findings allowed concluding that the Ayrshire cattle in terms of productivity was not inferior to the Kholmogory and could be localized as a planned breed in the Priokhotsk zone. Starting from 1976, state farms began to study the breeding and productive qualities of the Ayrshire breed, which were characterized by significant milk yield and high fat content in milk. Under equal conditions, the milk yield of the Ayrshire cows was 493 kg higher than that of the Kholmogory cows. Moreover, the total fat content in the milk of the Ayrshire cows was 23.95 kg higher. In 1982, the Ayrshire breed was approved as planned for breeding in the farms of the Priokhotsk zone. In the same year, the absorptive crossbreeding of the Kholmogory animals with the Ayrshire producers began. For this purpose, the semen of purebred bulls was widely used, 30.0% of which were improvers[4].

In the formation of dairy-oriented herds, selection based on the productivity of first-calving heifers became particularly important. The

[3]Yelin G.Ya., Vaganova E.S., Avdeeva L.V. Proceedings of the Magadan Zonal Research Institute of Agriculture of the North-East. Magadan, 1978, Issue 7, pp. 78-81.

[4]*Vaganova E.S., Soskin A.A.* Selection and breeding in dairy cattle breeding on an industrial basis. Novosibirsk, 1981, pp. 68-77.

Рис. 2. Проведение экспериментальных исследований сотрудниками Магаданского зонального научно-исследовательского института сельского хозяйства Северо-Востока

Fig. 2. Conducting pilot studies by the employees of the Magadan Zonal Research Institute of North Eastern Agriculture

leading selection traits for productivity remain milk yield and fat content in milk. To increase the efficiency of selection for high milk production, work was carried out in farms to increase the hereditary variability of this trait through breeding by lines, families, and in-depth individual breeding work. At the same time, the improvement of the Kholmogory cattle continued through the use of crossbreeding with purebred Holstein-Friesian bulls[5,6].

Due to the extensive use of crossbreeding as a method of improving productive and breeding qualities, significant additions and changes were made to the breeding and breeding plan in the Magadan region for the 1980s-1990s in 1984. It was envisaged to maximize the use of existing breeding resources - increasing milk yields, fat content in milk, animal resistance to diseases, adaptability to industrial technology conditions, increasing growth energy, and reducing feed costs per unit of production.

Many years of experience in breeding Ayrshire cattle showed that these animals had high productivity and reproduction indicators in the region. In terms of udder quality, milk fat content, and feed payment with milk, they outperformed Kholmogory and their crosses with Holsteins, which were bred in the state farms of the region. As a result of purebred breeding and targeted selection, a population of the Ayrshires well adapted to the extreme conditions of the Far Eastern North was created [2]. According to breed records, by 1990, the Ayrshire population reached 17,070 head, accounting for 46.5% of the total cattle population. Based on the evaluation in the same year, the milk yield for 305 days of the last lactation of the Ayrshire cows in the region was 4016 kg of milk with a fat content of 3.65%, and on pedigree farms – 4979 kg with a fat content of 3.67% [3].

Starting from 1989, the Laboratory of Selection and Breeding of the Magadan Zonal Research Institute of Agriculture of the Northeast began developing plans for breeding and breeding work in dairy cattle farming for 1990-2000. The main direction of development was the creation of highly productive herds of dairy cattle adapted for use in industrial technology conditions, with a genetic potential for milk production of 5500-6000 kg of milk with 3.8% fat content, a live weight of 600 kg, and a milking speed of 1.7-2.0 kg/min.

Unfortunately, these plans were not implemented. In the 1990s, due to ill-conceived economic reforms and the underestimation of the strategic role of northern regions by the state, the socio-economic situation deteriorated sharply. A crisis situation developed in the agro-industrial complex. Local production of agricultural and industrial products decreased by 40.0-58.0%. At the same time, the import of food products to northern regions sharply decreased, putting the local population in a difficult situation[7].

The difficult financial situation of farms and the lack of feed led to a significant reduction

[5]*Vaganova E.S., Vorsanova G.A.* Breeding work with dairy cattle breeds // Intensification of animal breeding in the Magadan region, 1984, N 10, pp. 7-13.

[6]*Kanygin B.N., Mikhailov N.G.* State and prospects for the development of dairy cattle breeding // Intensification of animal breeding in the Magadan region, 1984, N 10, pp. 3-7.

[7]*Kashtanov A.N.* Development of northern agriculture in the light of the concept of N.I. Vavilov // Agriculture of the North at the turn of the millennium: a collection of scientific articles, Magadan, 2004, vol. 1, 253 p.

in the cattle population and its productivity. Already in 1995, according to evaluations, the cattle population was only half of what it was in 1990. The milk yield per cow of the Ayrshire breed decreased to 2417 kg of milk with a fat content of 3.72%. By the early 2000s, the regional Production Association for breeding work was liquidated, and control and coordination of breeding work in farms ceased. Breeding work with breeding cattle was not conducted, and the genetic potential built up over decades was lost. The main cattle population was concentrated in peasant farms, where they decided for themselves which breed of cows to breed. Almost all farms that did not use artificial insemination (which covered 40.0% of the breeding stock) had unsystematic natural mating without pedigree control. The bulls used for reproduction did not have certificates of origin[8].

In 2006, 100 Ayrshire heifers were imported to the region from the Vologda region. All animals were used to replenish the commercial herd in one of the farms. The cattle had difficulty adapting to the local conditions, most of the calvings had complications, and only 15 live calves were born from the heifers. In the Magadan region, by 2010, there were only about 400 heads of Ayrshire cattle whose origin was confirmed by pedigree certificates. In the last three years, Ayrshire cows and heifers were inseminated with semen from the Red-and-White Holstein bulls, conducting absorptive crossbreeding. As a result, the unique local population of the Ayrshire cattle, bred in the farms of the region for more than 40 years, was completely displaced by animals of other breeds. In Russia as a whole, the Ayrshire population remains stable. In terms of productivity, the Ayrshire cows rank third after the Holsteins and Black-and-Whites [4–8].

Currently, the main cattle population of the region is concentrated in peasant farms. The process of changing the breed composition of cattle is influenced by economic and subjective reasons [9, 10]. In most farms, artificial insemination is not carried out, and cattle are often imported from other regions that differ significantly from the Magadan Region in terms of climate and economic conditions. Breeds such as Holstein, Red-and-White Holstein, Simmental, and others were not previously grown or studied in the region, and their adaptation to the harsh conditions of the North was not explored[9].

In the current political climate, with a focus on reducing the country's dependence on external factors, increasing self-sufficiency in essential food products becomes strategically important. This necessitates the need to address the challenges of forming a food base at the regional level. Considering the remote location of the Magadan Region and the complex logistics in delivering goods, ensuring the population's access to quality food products is of practical significance [11]. Therefore, the study of the adaptive qualities of imported cattle, their productive and reproductive abilities, and the identification of breeds and genotypes best suited to the conditions of the region becomes particularly relevant. The revival of work in this direction should mark a new stage in the history of breeding and breeding work in dairy cattle farming in the extreme conditions of the Far Eastern Far North.

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Дата поступления статьи / Received by the editors 27.07.2023
Дата принятия к публикации / Accepted for publication 06.10.2023
Дата публикации / Published 15.12.2023